ᐃᖃᓗᐃᑦ ᓄᓇᕗᑦ
ᑎᑎᖅᑲᓇᐃᔭᖅ 460
ᐃᖃᓗᐃᑦ, ᓄᓇᕗᒻ
X0A 0H0
ᐅᖃᓕᐅᑎᖓ (867) 979-5600
ᓱᑲᑐᓕᑦ (867) 979-5922

City of Iqaluit
Box 460
Iqaluit, Nunavut
X0A 0H0
Phone (867) 979-5600
Fax (867) 979-5922

Ville d'Iqaluit
C.P. 460
Iqaluit, Nunavut
X0A 0H0
Tél. (867) 979-5600
Télécop. (867) 979-5922

admin@city.iqaluit.nu.ca
www.city.iqaluit.nu.ca

June 10, 2019

Lootie Toomasie
Chairperson
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
Nunavut Water Board

RE: City of Iqaluit Request for Immediate Approval to Supplement Drinking Water Supply

Dear Mr. Toomasie,

This letter is not notify you that the City of Iqaluit (the City) is facing a shortage of potable water for the upcoming 2019-2020 winter, and that it is requesting the Nunavut Water Board (NWB)'s immediate approval to supplement the Lake Geraldine reservoir from the Apex (Niaqunguk) River, and possibly other sources. The situation arises because the reservoir has not recharged following spring melt and will not be full prior to freeze-up. Ongoing dry conditions have resulted in flows in local watersheds at or near historic lows.
Such request is being made while acknowledging that the NWB is currently conducting a public review of the City's application to amend its type A water licence 3AM-IQA1626.

BACKGROUND

As has been the basis of the City's application to amend its water licence, the City relies entirely on the Lake Geraldine reservoir to obtain its potable water. During winter months, the reservoir does not recharge from snowmelt and precipitation; therefore, the reservoir must have enough water in it at the onset of winter to supply the City's needs until the following spring. Due to recent City growth and increased water demand, the City has recognized that the reservoir must be full prior to the onset of ice cover in order to provide enough water to meet the City's demands throughout winter.

The available water in the reservoir during winter (October to May) is approximately 1,095,500 cubic metres (m^3); (Nunami Stantec, 2019). The reservoir must have enough water in it at the onset of winter to supply the City's needs until the following spring. Due to recent City growth and increased water demand, the City has recognized that the reservoir must be full prior to the onset of ice cover in order to provide the maximum volume

available to meet the City's demands throughout winter. The City's overwinter demands during 2016 to 2019 have averaged 3,413 m^3 per day, or 103,535 m^3 per month, with maximum overwinter demand of 920,000 experienced in winter 2017-18 (October to June). Assuming the 920, 000 m^3 demand for water over the winter period is actualized, approximately 170,000 m^3 of water remains available in the reservoir at the end of winter *if the reservoir is full at the onset of winter*. This volume does not leave a factor of safety to account for higher winter demand, longer winter, or emergency water use (such as firefighting).

In 2018, a shortage of available over-winter water was predicted based on a water balance model (Golder 2018). The Chief Medical Officer of Health responded by directing the City to supplement its water supply in order to avoid a public health emergency. The City established a Task Force consisting of federal, territorial and local entities to identify and initiate actions to: (1) repair leaks in the City's water distribution system; (2) initiate a campaign of water conservation; and, (3) implement a water supplementation project. To supplement water, the City immediately notified the Nunavut Water Board (NWB) of its intent to apply for an amendment to its water licence and initiated the regulatory approvals process under the emergency provisions of the *Nunavut Planning and Project Assessment Act* and *Nunavut Waters and Surface Rights Tribunals Act* (NWSRTA). A one-time amendment to the City's water licence was granted by the NWB and approved by the Minister of Crown-Indigenous and Northern Affairs Canada (CIRNA) on August 18, 2018, and a Fisheries Authorization from Fisheries and Oceans Canada (DFO) was obtained on August 16, 2018. Water withdrawal from the Apex River began on August 19 and continued to September 17, 2018. Approximately 194,000 cubic metres of water were transferred from the Apex River to Lake Geraldine. The program was ended once the reservoir was full, with monitoring continuing until September 24, 2018. No adverse effects to fish or fish habitat were observed.

In the approval of the water licence in 2018, the Minister of CIRNA indicated that the City would need to apply again under the regular mechanisms of the *Nunavut Waters and Surface Rights Tribunals Act*, if supplementation were to be needed again in future years. The NWB advised that this application process should be initiated as soon as practical. After completing post-program summary reporting required by DFO and Minister of CIRNA, the City initiated the application process for a longer term approval of a project to supplement water from the Apex River as a temporary measure while it researches, designs and implements permanent supplemental water storage and supply. In November 2018, the City completed a review of the 2018 project and developed designs for a new overland pipeline route. In December 2018, the City began its engagement with residents of the City of Iqaluit and Amaruq Hunters and Trappers Association (HTA) on its proposal to continue with supplementation from Apex from 2019 to 2026. In late December 2019, the City submitted its project proposal to the Nunavut Planning Commission, thereby initiating the

review of the Apex Drinking Water Supply Project. A screening of the project by the Nunavut Impact Review Board began February 14, 2019, with a screening decision issued April 14, 2019.

Concurrent with the NIRB screening, the City applied to the NWB to amend its water licence for the period 2019 to 2026 to:

- withdraw up to 500,000 cubic metres (m^3) of water annually during open water season from the Apex River and pump it to Lake Geraldine beginning in July 2019; and
- increase the total amount of water allowed annually to be withdrawn from Lake Geraldine, from 1,100,000 m^3 to 2,000,000 m^3.

This is the subject of the current application before the NWB.

APPROVAL TO SUPPLEMENT FROM APEX RIVER IS NEEDED IMMEDIATELY

In 2019 the City again retained Golder to complete a water balance assessment of Lake Geraldine, which estimates the predicted volume of available water in the reservoir prior to the 2019-2020 winter period. Based on an average case water consumption scenario for the City, the water balance concludes that the reservoir will not naturally recharge in 2019, resulting in a deficit of water in the reservoir at the onset of winter (Golder, 2019). Assuming a monthly demand of 115,000 m^3, there is a greater than 95% probability that the Lake Geraldine reservoir will not be full by freeze-up based on historic climate conditions. In order to have a full reservoir prior to freeze-up, and to provide safety factor to the supply of potable water over winter, the City must seek additional sources to supplement water volumes in the reservoir. ***Without supplementation, the City is likely to face an overwinter shortage of potable water in 2019/2020***.

As of the date of this letter, the Technical Review portion of the NWB's process has completed. The NWB has tentatively scheduled Public Hearings on the application during August 8-9, 2019. In accordance with the NWB's legislated timelines and past experience, a decision from the NWB on the application may be expected between 30 to 45 days after the close of the public record, with an additional 45 days provided to the Minister to accept the NWB's decision. On this timeline, approval to supplement Lake Geraldine from the Apex River will either not be granted prior to freeze-up or too late in the year for sufficient stream flows to be available in the Apex River. Flows in the Apex River as of July 5, 2019 are at, or near historic lows. ***The City will not receive approval to supplement from the Apex River prior to onset of freezing conditions or while there are sufficient flows in the Apex River in 2019 while following the normal regulatory process.***

The City is seeking relief from the normal NWB process such that it may receive approval to withdraw water from the Apex River immediately, while flows in the Apex River are sufficient for this purpose. The City is

uncertain of the regulatory process under which to do so, but understands that the *Nunavut Surface Waters and Rights Tribunals Act* (NSWRTA) has a provision which may be applicable, by which "…*a public hearing need not be held (c) in the case of an application for an amendment of a licence where the Board, with the consent of the Minister, declares the amendment to be required on an emergency basis*" (Section 52 (2)). The City understands the importance of a public review, and supports continuing with the public hearing process to amend its Type A Licence as they apply to the remainder of the term of the licence (to 2026). We understand there may be other considerations and understand that such process decisions would be made by the NWB.

ADDITIONAL CONTINGENCY MEASURES ARE BEING SOUGHT

Based on the available historical record of flows in the Apex River, as recorded at Water Survey of Canada Station 10UH002, flows generally decline rapidly during the last calendar month before freeze-up (September). Based on 33 years of data – scaled to the Apex River pumping location, in 32 of 33 years, 100,000 m^3 could have been extracted between August 1 and September 30 while withdrawing no more that 10% of the instantaneous flow when flows are greater than 30% of mean annual discharge (10IF/30MAD) – the withdrawal scenario proposed in its application. The likelihood of extracting more (200,000 m3, 300,000 m3 and 400,000 m3) during this period, and during a shorter period, as based on the historical record, is shown in Table 1.

Table 1: Number of years when specified volumes could be extracted from Apex River during specified time period while adhering to DFO criteria

Pumping window	August 1 - September 30	August 12 - September 30
Pump rate	150L/s	150L/s
Restrictions	DFO Guidelines (10IF/30MAD)	DFO Guidelines (10IF/30MAD)
Withdrawal (m^3)	**Number of years where this volume could have been extracted (out of 33)**	
100,000	32	30
200,000	26	24
300,000	22	15
400,000	14	8
500,000	5	2

NOTES:

Using standardized "bins" of 100,000 m3 to determine availability of each on historical record

Historical record contains 33 years from 1973-2017. Data missing 1984, 1996-2005 inclusive.

WSC 10UH002 discharge scaled using 0.73 factor (one time measurement from Stantec in 2018)

Given the current historic low flows in the Apex River and the possibility that the full amount necessary to fill the reservoir may not be available in the Apex over the

remainder of the open water season while adhering to 10IF/30MAD, the City will be seeking approval to implement additional contingency measures in 2019:

1. Withdraw available water from the Apex River in 2019 at a rate that exceeds 10IF/30MAD while maintaining flow in the Apex River. Approval from Fisheries and Oceans Canada and additional monitoring of fish and fish habitat will be required.
2. Obtain water from additional sources such as the Sylvia Grinnell River or Unnamed Lake. Additional information will need to be provided.
    - Taking water from Unnamed Lake involves pumping water out of the lake to a point where overland flow can be captured using a temporary dam and then transferred to the Apex River pumping system. This concept was approved by the NWB in the 2018 emergency situation. Unnamed Lake has sufficient volume to supplement Lake Geraldine and water quality samples have recently been collected. However, it is a challenging project to implement as a temporary solution.
    - Conceptually, the City would pump water from the Sylvia Grinnell River into water trucks and transport to the water treatment plant. Public concerns have been raised with using this source due to its recreational and cultural value.

As in 2018, supplementation would cease when: (1) the Lake Geraldine reservoir is full; or, (2) the onset of freezing conditions.

The City notes that concurrently, it is reviewing options to restrict water supply to its residents and businesses.

CONCLUSION

We seek the Nunavut Water Board's immediate approval to withdraw water from the Apex River in 2019 to preclude a water shortage for the City of Iqaluit during the 2019-2020 winter season.

Water balance modeling indicates that the Lake Geraldine reservoir will not recharge naturally prior to freeze-up. A full reservoir is required at the onset of winter to provide maximum confidence in potable water supply over winter. The City has to date, made every effort to obtain approval to supplement water from the Apex River under the normal procedural requirements of the NSWRTA; however approval will not be received prior to freeze-up and while there are sufficient flows. Immediate approval to supplement from Apex River and other sources is required to preclude a potable water shortage in the City of Iqaluit during winter 2019-2020. I thank you therefore for your review of this information and concurrence. Please do not hesitate to contact me should you have any questions.

<u>References</u>

Golder. 2019 Supplementary Lake Geraldine Water Balance Modeling Technical Memorandum. Submitted to Colliers Project Leaders. June 21, 2019..
Golder. 2019 Supplementary Lake Geraldine Water Balance Modeling Technical Memorandum. Submitted to Colliers Project Leaders. June 21, 2019..

Nunami Stantec 2019. Memo: Lake Geraldine Reservoir Storage – Desktop Review and Assessment. Submitted to City of Iqaluit. January 1, 2019.

Regards,

Amy Elgersma
Chief Administrative Officer
City of Iqaluit
Box 460, Iqaluit, NU
X0A 0H0

Cc: *Derek Donald, Technical Advisor NWB*
Mayor Redfern, City of Iqaluit
Deputy Mayor Stevenson, City of Iqaluit
Matthew Hamp, Director Public Works and Engineering
Josip Deronja, Acting Engineering Manager
Erica Bonhomme, Nunami-Stantec