





Revision History					
Rev	Date	Comments	Originator	Reviewed	Approved
0	December 23, 2025	Issued original application	RAC	KK	KK
1	April 24, 2026	Incorporated information requests from CIRNAC and DFO	RAC	OU	MA







## Executive Summary

Type A Water Licence No. 3AM-IQA1626 authorizes the City of Iqaluit to use water and deposit waste in support of municipal undertakings as classified under Schedule 1 of the Nunavut Water Regulations. The licence expires June 16, 2026. The City of Iqaluit is seeking to renew and amend the licence.

An initial application was submitted to the Nunavut Water Board at the end of 2025, and the NWB circulated it for completeness review on January 8, 2026. Information requests were submitted to the NWB by Crown-Indigenous Relations and Northern Affairs Canada and Fisheries and Oceans Canada on February 6, 2026. This revised Application is an update of the initial application and addresses the information requests received.

Facilities operated under the current licence include:

- Permanent water supply infrastructure including the Lake Geraldine Reservoir and water treatment plant
- Temporary water supply facilities to supplement the permanent water supply
- West 40 Landfill
- North 40 Landfill and Waste Transfer Station, added to the current licence under an amendment in 2021
- Sewage treatment plant and sewage lagoon

An amendment to the licence is also requested for the City's Long Term Water Supply Project. Since 2018, the City sought several emergency amendments to the licence to withdraw water from new sources to meet the City's growing water demand. The City's recently developed Long Term Water Supply Project will provide a permanent solution to the City's water supply needs for the next several decades. It includes the following:

- Water intakes in the Niaqunngut (Apex) River and Lake Qikiqtaalik
- A new reservoir located immediately east of Lake Geraldine Reservoir
- Pumps and pipelines to convey raw water from the two new water sources to the new reservoir
- A pipeline and outfall to feed water from the new reservoir to Lake Geraldine
- All weather access roads between the new facilities

The additional water supply and storage will add to the existing water supply and water treatment facilities. All the proposed facilities are situated inside the City's boundaries.

The City plans to construct new facilities over the period of mid-2026 to October 2029. It will require the development of several quarries, the operation of heavy equipment, and the storage and use of fuel, explosives, and lubricating oils and greases for equipment maintenance. A workforce of approximately 65 personnel is expected, and workers will be housed in existing accommodation within the city.

Until the above facilities are operational, it will be necessary to continue to operate existing temporary facilities to provide pumping water from Niaqunngut (Apex) River, as previously authorized under an emergency amendment.



## Résumé

Le permis d'utilisation de l'eau de type A n° 3AM-IQA1626 autorise la ville d'Iqaluit à utiliser l'eau et à rejeter des déchets dans le cadre des activités municipales telles que classées à l'annexe 1 du Règlement sur l'eau du Nunavut. Ce permis expire le 16 juin 2026. La ville d'Iqaluit souhaite renouveler et modifier ce permis.

Une demande initiale a été soumise à l'Office des eaux du Nunavut à la fin de l'année 2025, et l'OEN l'a diffusée pour examen de conformité le 8 janvier 2026. Des demandes d'informations ont été soumises à l'OEN par Relations entre la Couronne et les Autochtones et Affaires du Nord Canada ainsi que Pêches et Océans Canada le 6 février 2026. La présente demande révisée constitue une mise à jour de la demande initiale et répond aux demandes d'informations reçues.

Les installations exploitées en vertu du permis actuel comprennent :

- Les infrastructures permanentes d'approvisionnement en eau, notamment le réservoir du lac Geraldine et la station de traitement de l'eau
- Les installations temporaires d'approvisionnement en eau destinées à compléter l'approvisionnement permanent
- La décharge West 40
- La décharge North 40 et la station de transfert des déchets, ajoutées au permis actuel dans le cadre d'une modification en 2021
- La station d'épuration des eaux usées et le bassin de décantation

Une modification du permis est également demandée dans le cadre du projet d'approvisionnement en eau à long terme de la ville. Depuis 2018, la ville a sollicité plusieurs modifications d'urgence du permis afin de prélever de l'eau à partir de nouvelles sources pour répondre à la demande croissante en eau de la ville. Le projet d'approvisionnement en eau à long terme récemment élaboré par la ville apportera une solution permanente aux besoins en eau de la ville pour les prochaines décennies. Il comprend les éléments suivants:

- Des prises d'eau dans la rivière Niaqunngut (Apex) et le lac Qikiqtaalik
- Un nouveau réservoir situé immédiatement à l'est du réservoir du lac Geraldine
- Des pompes et des canalisations pour acheminer l'eau brute depuis les deux nouvelles sources d'eau vers le nouveau réservoir
- Une canalisation et un exutoire pour acheminer l'eau du nouveau réservoir vers le lac Geraldine
- Des routes d'accès praticables par tous les temps entre les nouvelles installations

Ces capacités supplémentaires d'approvisionnement et de stockage en eau viendront s'ajouter aux installations existantes d'approvisionnement et de traitement de l'eau. Toutes les installations proposées sont situées à l'intérieur des limites de la ville.

La ville prévoit de construire de nouvelles installations entre mi-2026 et octobre 2029. Cela nécessitera l'exploitation de plusieurs carrières, l'utilisation d'engins de chantier, ainsi que le stockage et l'utilisation de carburant, d'explosifs, d'huiles lubrifiantes et de graisses pour l'entretien des équipements. Une



main-d'œuvre d'environ 65 personnes est prévue, et les travailleurs seront logés dans des hébergements existants au sein de la ville.

Jusqu'à ce que les installations susmentionnées soient opérationnelles, il sera nécessaire de continuer à exploiter les installations temporaires existantes pour assurer le pompage de l'eau de la rivière Niaqunngut (Apex), comme cela a été précédemment autorisé en vertu d'un amendement d'urgence.





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Attachment 8	Lake Geraldine Dam Safety Review
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Attachment 59	Facility Monitoring Plan - Landfill and Waste Transfer Station
Attachment 60	Apex River Historical Streamflow Statistics



## 1.0 INTRODUCTION

### 1.1 OVERVIEW

Type A Water Licence No. 3AM-IQA1626 authorizes the City of Iqaluit to use water and deposit waste in support of municipal undertakings as classified under Schedule 1 of the Nunavut Water Regulations. The licence was issued on June 17, 2016, and expires June 16, 2026.<sup>1</sup> The City of Iqaluit is seeking to renew and amend the licence. A completed NWB application form is presented as Attachment 1.

An initial application dated December 2025 was submitted to the Nunavut Water Board (NWB), and the NWB circulated it for completeness review on January 8, 2026. Information requests were submitted to the NWB by Crown-Indigenous Relation and Northern Affairs Canada (CIRNAC, 2026) and Fisheries and Oceans Canada (DFO, 2026) on February 6, 2026. This revised Application is an update of the initial application and addresses the information requests received.

The main components subject to the new water licence (including additions to be incorporated as an amendment in the licence) are shown on Figure 1.1. Municipal infrastructure that are subject to the current licence include the Lake Geraldine Reservoir and associated water treatment plant, a wastewater treatment plant (WWTP), sewage lagoon, the West 40 Landfill, and the North 40 Landfill and Waste Transfer Station.

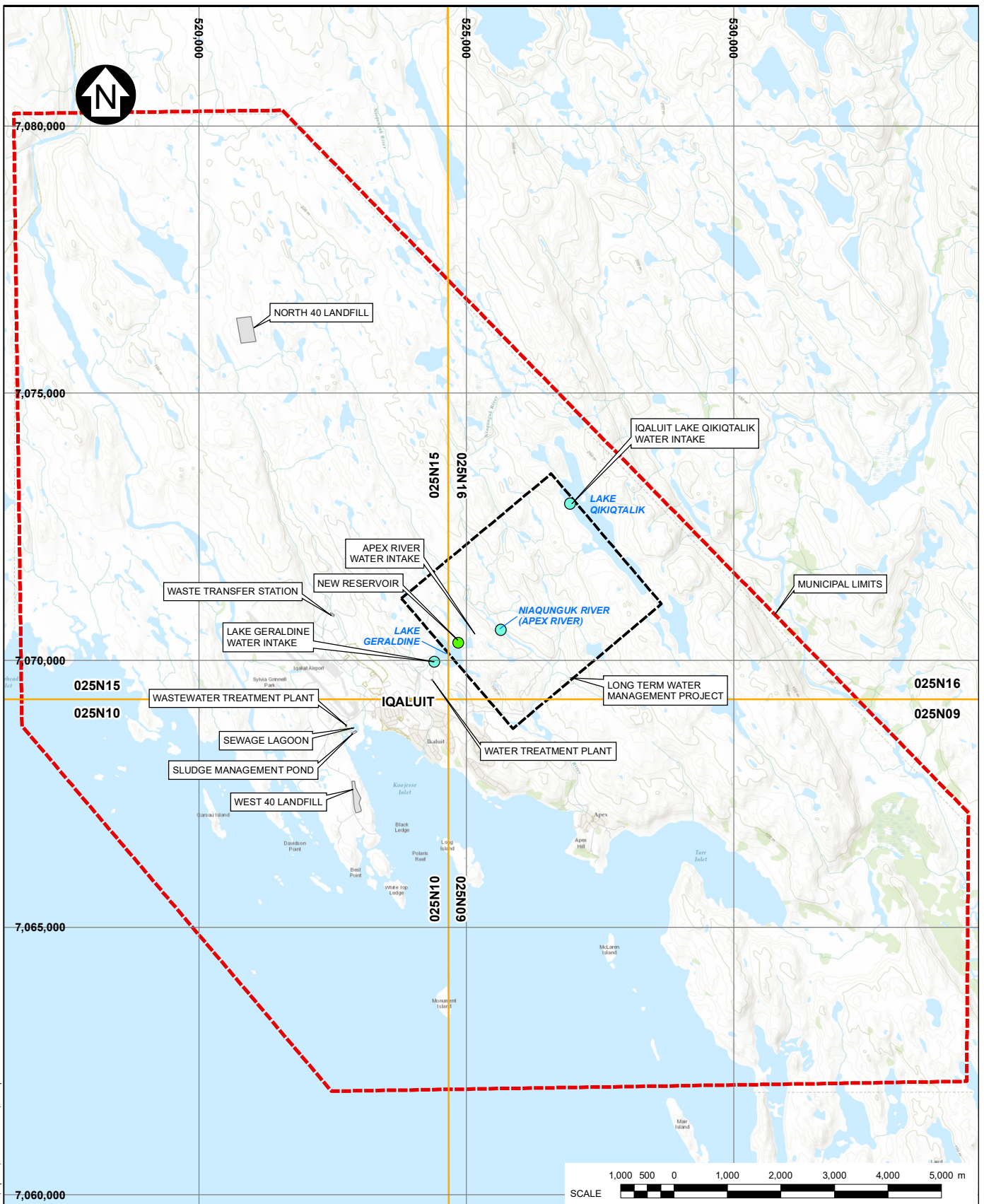
An amendment is also requested to incorporate the City's Long-Term Water Project (LTWP). The current Licence has been amended seven times since 2018 to temporarily allow the City of Iqaluit to draw additional water because the Lake Geraldine Reservoir cannot meet the City's current and growing demand. The City has been rapidly developing into a regional center for the territory, which has led to a rapid growth in population. The City of Iqaluit's population was 7,429 in 2021 (Government of Canada, 2025), and the forecasted growth rate is 3% - 4% annually (Arcadis Canada Inc., 2025a).

Water Licence No. 3AM-IQA1626 authorized the City to withdraw 1,100,000 m<sup>3</sup>/year of water from the Lake Geraldine Reservoir. This was increased to 2,000,000 m<sup>3</sup>/year in the latest amendment to the licence (Amendment #7; NWB, 2022), which expires when the current Licence expires on June 16, 2026. A study by EXP Services Inc. (2020) predicts that the City's annual water demand will increase to about 1,500,000 m<sup>3</sup> by 2025 and will reach about 3,500,000 m<sup>3</sup> by 2050 (Figure 1.2).

Section 3.3 of this Application provides a description of the City's LTWP, so that the NWB can consider amending the renewed licence to incorporate the LTWP.

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<sup>1</sup> The City has also applied for a short-term renewal of the current licence, to extend its validity an additional 180 days.



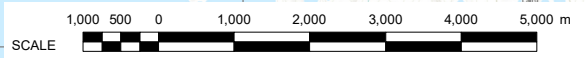
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**LEGEND:**

- NEW RESERVOIR
- WATER INTAKE
- MUNICIPAL LIMITS
- FACILITY
- LONG TERM WATER MANAGEMENT PROJECT
- 1:50,000 SCALE NTS MAPSHEET

**NOTES:**

1. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N.
2. BASE MAP/IMAGERY: © ESRI AND DATA (ONLINE) SERVICE LAYERS (2025). REDLANDS, CA; ENVIRONMENTAL SYSTEM RESEARCH INSTITUTE. ALL RIGHTS RESERVED.
3. NTS: NATIONAL TOPOGRAPHIC SYSTEM.



CITY OF IQALUIT

TYPE A WATER LICENCE

**MUNICIPAL FACILITIES  
SUBJECT TO WATER LICENCE**



PIA NO. NB102-537/1	REF NO. 1
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**FIGURE 1.1**

REV  
1

REV	DATE	DESCRIPTION	RAC DESIGNED	BAC DRAWN	RAC REVIEWED
1	24APR'26	ISSUED WITH REPORT			

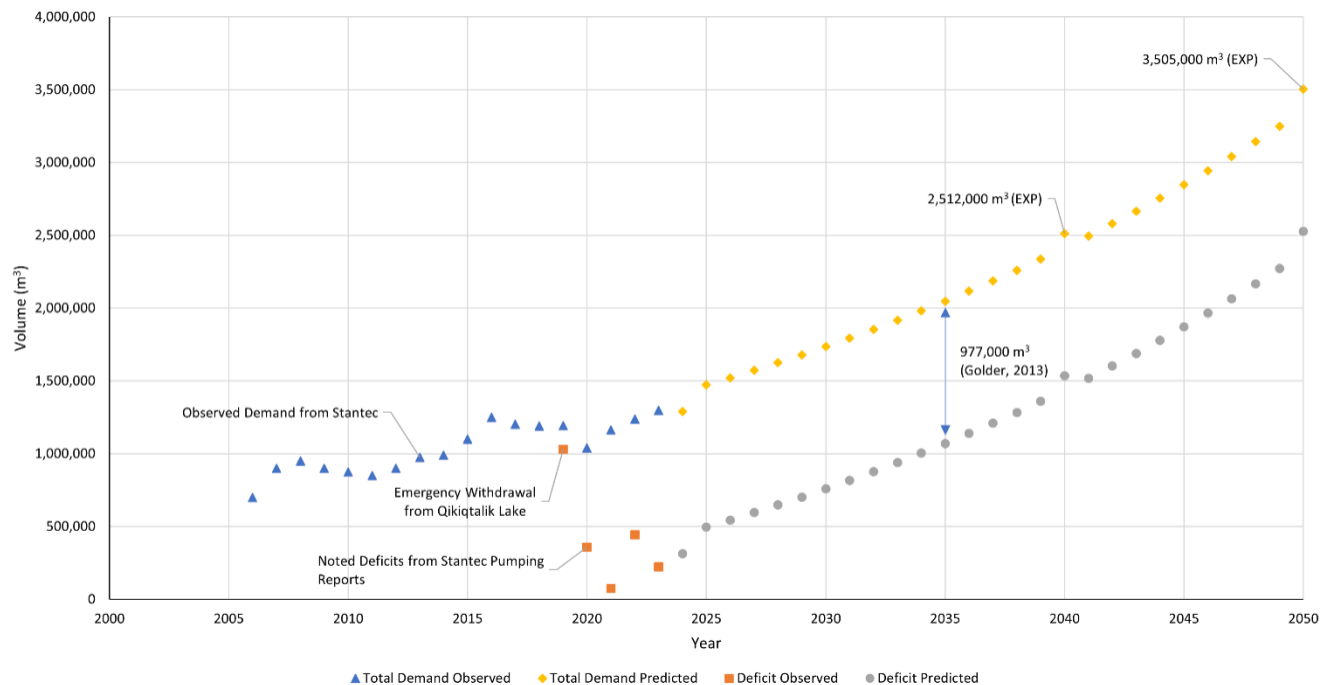


Figure 1.2 Projected City of Iqaluit Water Demand to 2050 (from Tetra Tech, 2025a)

## 1.2 APPLICANT

The Applicant/Licensee is the City of Iqaluit, and the primary point of contact is:

Kevin Kerr, P.Eng.  
 Director of Engineering and Capital Projects  
 City of Iqaluit  
 902 698-7872 / 867 979-5636  
 Email: [k.kerr@iqaluit.ca](mailto:k.kerr@iqaluit.ca)

The City of Iqaluit became a City on April 19, 2001 (<https://iqaluit.ca/visitors/explore-iqaluit/history>).

## 1.3 LICENCE AMENDMENT HISTORY

The current Water Licence was amended seven times between 2018 and 2022 to temporarily authorize the City of Iqaluit to obtain additional water from several water sources on an emergency basis, as summarized in Table 1.1.

Amendment No. 5 obtained in 2021 also approved the construction and operation of new solid waste facilities, including the North 40 Landfill and Waste Transfer Station (WTS). The latest (Amendment No. 7) authorize the City of Iqaluit to obtain additional water from several water sources on an emergency basis until the licence expires on June 16, 2026. As noted in Section 1.1, an application for a short-term (180-day) renewal of the licence was submitted on March 13, 2026.



Table 1.1 Amendment History of Water Licence 3AM-IQA1626

Amendment No.	Reason	Issue Date
	Issuance of original licence	June 17, 2016
1	<b>Temporary water withdrawal:</b> The temporary withdrawal (in August - October 2018) of Water from the Niaqunguk River (Apex River) watershed to replenish Lake Geraldine Reservoir for the winter of 2018-2019.	Aug 14, 2018
2	<b>Temporary water withdrawal:</b> The temporary withdrawal (August 2019 – October 2019) of up to 500,000 m <sup>3</sup> of Water from the Niaqunguk River (Apex River) to replenish Lake Geraldine Reservoir for the winter of 2019-2020; and the increase in the total amount allowed to be withdrawn from Lake Geraldine, from 1,100,000 m <sup>3</sup> /year to 2,000,000 m <sup>3</sup> /year.	July 22, 2019
3	<b>Temporary water withdrawal:</b> The temporary withdrawal (August 2019 – October 2019) of up to 700,000 m <sup>3</sup> of Water from the large unnamed source water lake (Unnamed Lake) and transferring it to the Niaqunguk River (Apex River), and/or subsequently withdrawing up to 700,000 m <sup>3</sup> of water from the Apex River, and transferring it to Lake Geraldine Reservoir for storage over the winter of 2019-2020; and the increase in the total amount allowed to be withdrawn from Lake Geraldine, from 1,100,000 m <sup>3</sup> /year to 2,000,000 m <sup>3</sup> /year.	Aug 2, 2019
4	<b>Temporary water withdrawal:</b> 2,000,000 m <sup>3</sup> annually from Lake Geraldine Reservoir, 500,000 m <sup>3</sup> annually from Niaqunguk River (Apex River) for transfer to Lake Geraldine Reservoir	Sept 4, 2019
5	<b>Temporary water withdrawal:</b> 2,000,000 m <sup>3</sup> annually from Lake Geraldine Reservoir, 500,000 m <sup>3</sup> from Niaqunguk River (Apex River) for transfer to Lake Geraldine Reservoir, and 2,500 m <sup>3</sup> annually from Imiqtarviviniq (Dead Dog Lake). New landfill: Construction and operation of the new solid waste management facilities, including the Waste Transfer Station, the New North Landfill, and associated infrastructure.	Mar 15, 2021
6	<b>Temporary water withdrawal:</b> 2,000,000 m <sup>3</sup> annually from Lake Geraldine Reservoir, 500,000 m <sup>3</sup> from Niaqunguk River (Apex River) for transfer to Lake Geraldine Reservoir, 2,500 m <sup>3</sup> annually from Imiqtarviviniq (Dead Dog Lake), and 350 m <sup>3</sup> daily from Sylvia Grinnell River during state of emergency.	Oct 15, 2021
7	<b>Temporary water withdrawal:</b> 2,000,000 m <sup>3</sup> annually from Lake Geraldine Reservoir, 900,000 m <sup>3</sup> in 2022 from Niaqunguk River (Apex River) for transfer to Lake Geraldine Reservoir, 2,500 m <sup>3</sup> annually from Imiqtarviviniq (Dead Dog Lake), and 600,000 m <sup>3</sup> in 2022 from large unnamed source water lake (unnamed lake) to the Niaqunguk River (Apex River).	Aug 22, 2022



## 1.4 REGULATORY STATUS

The Nunavut Planning Commission (NPC) reviewed an application for the short-term renewal of the current licence for the existing water and waste management facilities and concluded that the project proposal is outside the area of an applicable regional land use plan, and that the activities were previously reviewed by NPC and were previously screened by the Nunavut Impact Review Board (NPC, 2026). This letter and a 2025 determination of the LTWP component of this Application (NPC, 2025) are presented as Attachment 2.

The LTWP portion of the Application was subject to screening by the Nunavut Impact Review Board (File No. 25XN041; NIRB, 2026). The screening decision report (SDR) is presented as Attachment 3. There are terms and conditions in the SDR that will require implementation by the City when constructing and operating the LTWP.

A request for review was submitted to Fisheries and Oceans Canada (DFO, 2024) for the proposed intake and water extraction from the Niaqunguk (Apex) River, and the resultant advice from the DFO is included as Attachment 4.

## 1.5 CONTENTS OF THIS APPLICATION

The following Sections of this Application are organized address the following corresponding parts of the current Licence:

- Section 2 Part A: Scope, Definitions and Enforcement
- Section 3 Part D: Conditions Applying to the Use of Waters and Water Management Plans
- Section 4 Part E: Conditions Applying to the Deposit of Waste and Waste Management Plans
- Section 5 Part H: Conditions Applying to Spill Contingency Planning
- Section 6 Part I: Conditions Applying to Monitoring
- Section 7 Part J: Conditions Applying to Closure and Reclamation

The following parts of the Licence have been omitted since they contain general terms and conditions that do not relate to the specific infrastructure components that are subject to the licence:

- Part B: General Conditions
- Part C: Conditions Applying to Security
- Part F: Conditions Applying to Construction
- Part G: Conditions Applying to Modifications

Attachments to this Application Main Document are listed in Table 1.2. The completed Supplemental Information Guideline tables are presented as Attachment 5. The City's financial statements are presented as Attachment 6.



Table 1.2 Attachments to this Application

Attachment No.	Attachment Title
APPLICATION AND PROPONENT INFORMATION	
1	Application for Water Licence Amendment
2	NPC Correspondence
3	NIRB Screening Decision Report
4	DFO Advice Letter
5	Application Concordance to the Supplementary Information Guideline
6	City of Iqaluit's Financial Statements
7	Compliance Assessment
INFORMATION ON EXISTING WATER MANAGEMENT FACILITIES	
8	Lake Geraldine Dam Safety Review
9	Lake Geraldine Dam Breach Analysis
10	Lake Geraldine Intake Replacement Conceptual Design
11	Water Treatment Plant O&M Manual
INFORMATION ON THE LONG TERM WATER PROJECT (LTWP)	
12	LTWP Lake Geraldine Water Balance (2013)
13	LTWP Lake Geraldine Water Balance Update (2025)
14	LTWP Site Plans
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Attachment No.	Attachment Title
27	LTWP Detailed Design Report - Appendix L - Basis of Estimate
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38	LTWP Geotechnical Report
39	LTWP Aggregate Assessment Report
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44	WWTP Redesign Development Report
45	Sewage Lagoon O&M Manual
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53	North 40 Landfill and Waste Transfer Station Closure and Decommissioning Plan
54	North 40 Landfill and Waste Transfer Station Environmental Management Plan



Attachment No.	Attachment Title
55	North 40 Landfill and Waste Transfer Station Environmental Protection Plan
INFORMATION ON SPILL CONTINGENCY PLANNING	
56	Spill Contingency Plan
57	Apex River Water Withdrawal: Site Specific Spill Contingency Plan)
INFORMATION ON MONITORING PROGRAMS	
58	Environmental Monitoring and Quality Assurance / Quality Control Plan
59	Facility Monitoring Plan - Landfill and Waste Transfer Station
60	Apex River Historical Streamflow Statistics

## 1.6 COMPLIANCE ASSESSMENT

An assessment of the City’s compliance with the terms and conditions of the licence (including active amendments) is presented as Attachment 7a, and the most recent CIRNAC inspection from June 2025, which did not identify any non-compliances, is presented as Attachment 7b.



## 2.0 PROPOSED CHANGES TO THE SCOPE OF THE LICENCE (PART A)

Part A, Item 1 of the current Licence presents the coordinates of the City’s municipal boundaries and key water and waste management facilities, which are identified in Table 2.1. Additional facilities not identified in the current Licence appear in blue text in Table 2.1.

Table 2.1 Municipal Undertaking Geographic Coordinates

Undertaking	Latitude	Longitude	UTM Coordinates (NAD83, Zone 19N)	
			Northing (m)	Easting (m)
Overall extents	63° 50' 56.31" N	68° 39' 49.87" W	7080228	516530
	63° 50' 57.30" N	68° 33' 41.94" W	7080289	521555
	63° 43' 48.91" N	68° 18' 12.53" W	7067143	534395
	63° 41' 06.60" N	68° 18' 18.82" W	7062118	534364
	63° 41' 04.08" N	68° 32' 44.20" W	7061934	522475
	63° 44' 46.02" N	68° 39' 43.1 0" W	7068767	516683
West 40 Landfill	63° 43' 58.15" N	68° 32' 08.54" W	7067325	522926
Water Treatment Plant	63° 45' 12.24" N	68° 30' 22.79" W	7069629	524358
Wastewater Treatment Plant	63° 44' 45.15" N	68° 32' 19.80" W	7068778	522761
Sewage Lagoon	63° 44' 44.24" N	68° 32' 10.59" W	7068751	522887
Waste Transfer Station	63° 45' 52.06" N	68° 32' 38.86" W	7070848	522485
North 40 Landfill	63° 48' 46.71" N	68° 34' 32.95" W	7076243	520886
New water reservoir	63° 45' 38.48" N	68° 29' 22.65" W	7070448	525176
Niaqunngut (Apex) River intake	63° 45' 38.47" N	68° 28' 36.52" W	7070452	525808
Lake Qikiqtalik intake	63° 46' 58.04" N	68° 27' 11.86" W	7072925	526947
Dead Dog Lake dust suppression site	63° 44' 48.87" N	68° 29' 19.58" W	7068913	525231

Part A, Item 1 also presents a bulleted list describing the scope of the Licence. This scope is presented in Table 2.2 along with proposed additions as part of this Application.



Table 2.2 Proposed Modifications to the Scope of the Current Water Licence

Item No.	Current Scope of the Licence (NWB, 2016)	Proposed Modifications/Updates
a.	Use, management, and protection of the Lake Geraldine drainage basin	No change
b.	Management and protection of Waters surrounding the West 40 Landfill site	No change
c.	Management, collection, and monitoring of leachate from the West 40 Landfill site and adjacent Sludge Management Facility	No change
d.	Management of improved drainage works at the West 40 Landfill site	No change
e.	Management, operation, and eventual closure and reclamation of the current West 40 Landfill site and associated solid waste disposal facilities	No change
f.	Upgrades, operation, maintenance, monitoring, and eventual closure and reclamation of a Wastewater Treatment Plant (WWTP)	No change
g.	Operation, maintenance, monitoring, and eventual closure and reclamation of a Sludge Management Facility	No change
h.	Operation, maintenance, monitoring and eventual closure and reclamation of a Sewage Lagoon Facility	No change
i.	Implementation of contingency measures for the Wastewater and Landfill management facilities	No change
j.	Implementation of changes to the monitoring requirements including frequency, parameters, and stations being monitored	No change
k.	Operation and removal of temporary facilities to provide pumping water from Niaqunguk (Apex) River until permanent facilities have been constructed	As per earlier amendments
l.	Construction and operation of the new solid waste management facilities, including the Waste Transfer Station, the North 40 Landfill, and associated infrastructure. (Amendment No. 5)	No change
m.	Construction, operation and removal of temporary facilities to provide for pumping water from the Unnamed Lake (Amendment No. 7)	No change; now named Lake Qikiqtalik
n.	Construction and operation of permanent facilities associated with the Long-Term Water Supply Project, including a new reservoir, water intakes and pumphouses at the Niaqunguk (Apex) River and Lake Qikiqtalik, pipelines, and related infrastructure	New
o.	Withdrawal from Imiqtariviviniq (Dead Dog Lake) for dust suppression	As per earlier amendments

The current Water Licence and the attachments to this Application refer to the traditional name for Apex River as “Niaqunguk”, and thus this spelling has been used in the tables above. However, the City of Iqaluit’s website, online archives of the Government of Canada, and other online sources refer to the river with the spelling “Niaqunngut”. Thus, the City of Iqaluit has adopted the spelling “Niaqunngut” throughout the remainder of this Application, and suggests it be used in the new licence.

## 3.0 WATER USE (PART D)

### 3.1 CURRENT WATER SUPPLY FACILITIES

The current water supply infrastructure consists of:

- Lake Geraldine Reservoir and associated raw water intake and pumphouse
- Temporary raw water intake on the Niaqunngut (Apex) River and pipeline to Lake Geraldine
- Potable water treatment facility

The location of the Lake Geraldine Reservoir and the Water Treatment Plant are shown on Figure 3.1.

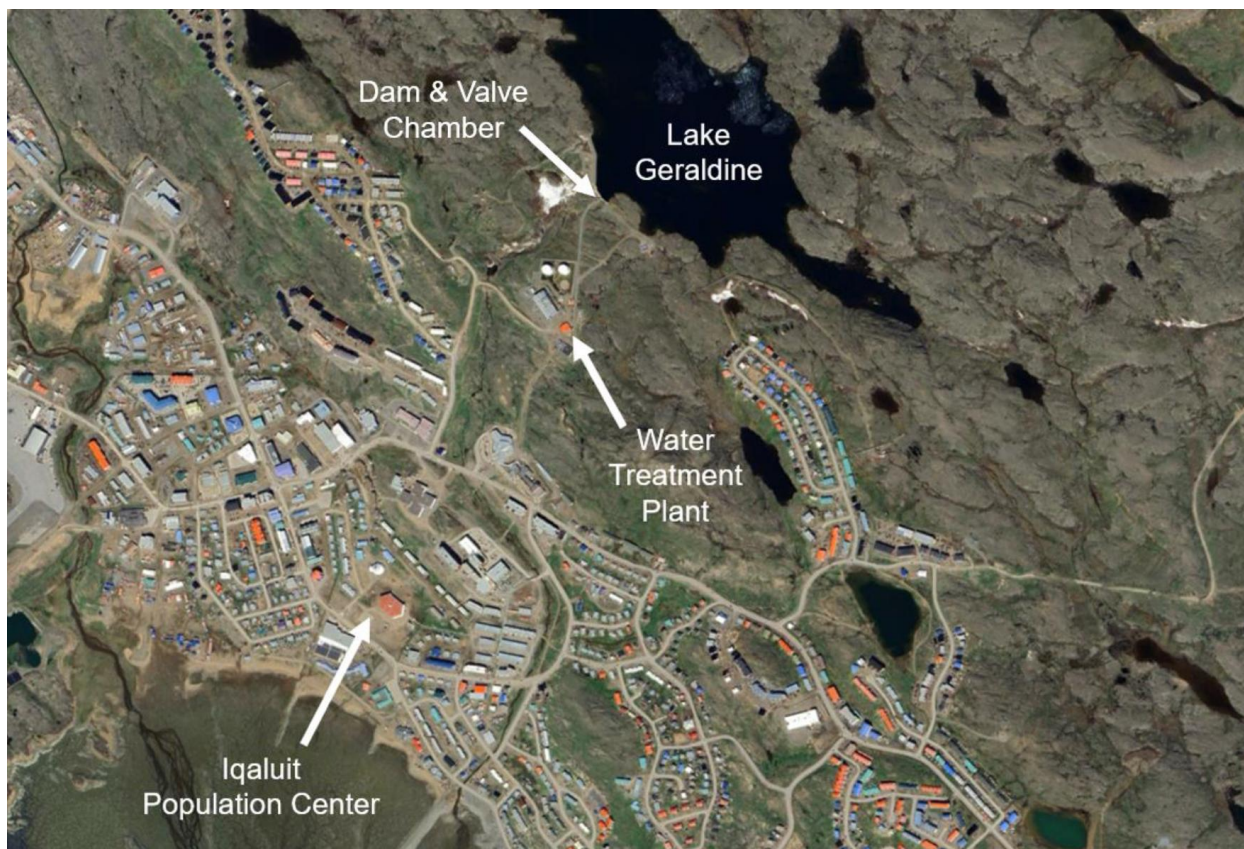


Figure 3.1 Location of Lake Geraldine Reservoir and Water Treatment Plant (WSP, 2024)

The Lake Geraldine Reservoir is formed by a small dam on the outlet of Lake Geraldine (Figure 3.2). The Lake Geraldine dam is comprised of a concrete section with integral spillway, and three earth berm sections, designated north, central, and south. The dam was constructed in the late 1950s and has been expanded to increase the reservoir capacity over the years (WSP, 2024).

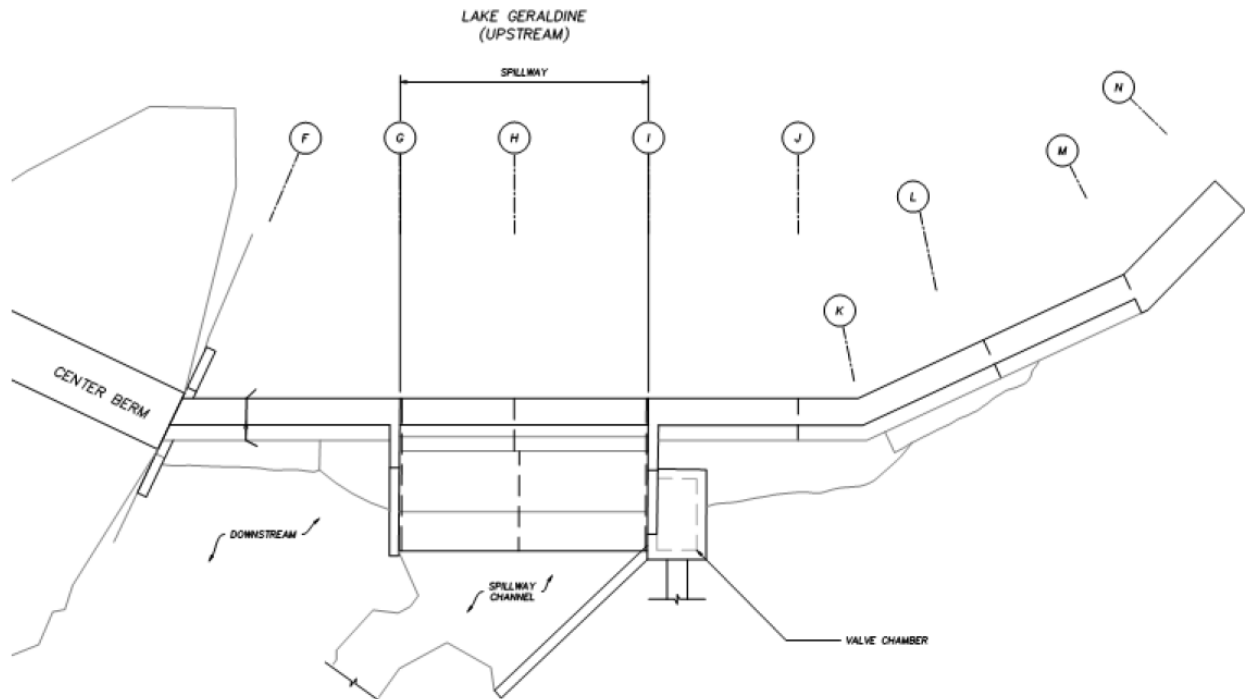


Figure 3.2 Lake Geraldine Concrete Dam and Spillway (Concentric, 2023)

The last dam safety review (DSR) of the Lake Geraldine Dam was completed in 2024 (Mitchelmore Consulting International Ltd., 2025; Attachment 8), and a list of deficiencies identified during the DSR were presented in the 2025 annual report along with deadlines. The most recent A dam breach analysis, completed for the Lake Geraldine Dam in 2011, is presented as Attachment 9.

A submerged raw water intake draws water from the reservoir and conveys it via buried piping to the adjacent water treatment plant (Figures 3.3 and 3.4). The intake is equipped with screening to limit debris and ice ingress and is located at depth away from the immediate shoreline to improve water quality and reduce the influence of surface ice and wave action. Flow to the plant is controlled and metered at the treatment facility rather than by complex control structures at the intake itself, consistent with small, cold-region municipal reservoirs.

A condition assessment completed in 2022 noted that nearly all components of the valve chamber and associated components (piping & valving, electrical, mechanical) were severely corroded and require replacement (Concentric, 2023). A conceptual design including drawings (WSP, 2024) is presented as Attachment 10.



Figure 3.3 Lake Geraldine Access Vault (WSP, 2024)



Figure 3.4 Access Road between the WTP and Lake Geraldine Access Vault



Using this conceptual design, the City plans to tender a design-build for a replacement intake valve in the second half of 2026. Issued for Construction (IFC) drawings will be submitted to the NWB for review at least 30 days prior to commencing construction, in accordance with Part F, Item 1 of the licence.

The water treatment plant is operated in accordance with the Water Treatment Plant O&M Manual (Attachment 11).

### 3.2 PROPOSED WATER WITHDRAWAL VOLUMES

As noted in Section 1.3, the current Licence has been amended several times to provide short-term water withdrawal increases to account for the increasing demand of water by the growing City of Iqaluit. The City has developed a long-term solution with the LTWP and is seeking to amend the current Licence with this renewal to account for the changes.

The water balance developed for Lake Geraldine Reservoir by Golder Associates (2013) is presented as Attachment 12, and an update to the model using updated bathymetry and additional water level data, prepared by WSP (2025), is presented as Attachment 13.

The new plan includes the addition of two permanent water supply sources in addition to the existing Lake Geraldine Reservoir: Lake Qikiqtalik and the Niaqunngut (Apex) River. Both water sources have been used to top up the Lake Geraldine Reservoir under the recent emergency amendments to the current Licence. The proposed water extraction volumes are presented in Table 3.1.

Table 3.1 Proposed Water Use

Source	Authorized Water Use Volume (m <sup>3</sup> /year) <sup>1</sup>	Proposed Annual Water Use (m <sup>3</sup> /year)
Lake Geraldine Reservoir	2,000,000	3,500,000 <sup>2</sup>
Niaqunngut (Apex) River	900,000	1,600,000 <sup>3</sup>
Lake Qikiqtalik	600,000	1,300,000

**Note(s):**

1. Approved volume as per Amendment #7. Under this amendment, the 600,000 m<sup>3</sup> withdrawal from Lake Qikiqtalik was for transfer into the Niaqunngut (Apex) River, and the withdrawal from Niaqunngut (Apex) River was for transfer to the Lake Geraldine Reservoir, from which the City draws water.
2. Total volume withdrawn from Lake Geraldine, which includes previously approved supplementation from Niaqunngut (Apex) River and Lake Qikiqtalik.
3. The daily withdrawal rate is subject to the withdrawal rules accepted by the DFO (2024).

While the proposed annual water extraction volume from Lake Geraldine is much higher at 3,500,000 m<sup>3</sup>, most of this water will originate from Niaqunngut (Apex) River (1,600,000 m<sup>3</sup>) and Lake Qikiqtalik (1,300,000 m<sup>3</sup>), and much less (600,000 m<sup>3</sup>) will rely on natural inflows from the Lake Geraldine catchment. A block flow diagram showing the relationship between the three water sources is shown graphically on Figure 3.5. The existing water treatment facility will continue to be supplied from the Lake Geraldine Reservoir, and there are no changes to the distribution system downstream of the treatment facility.

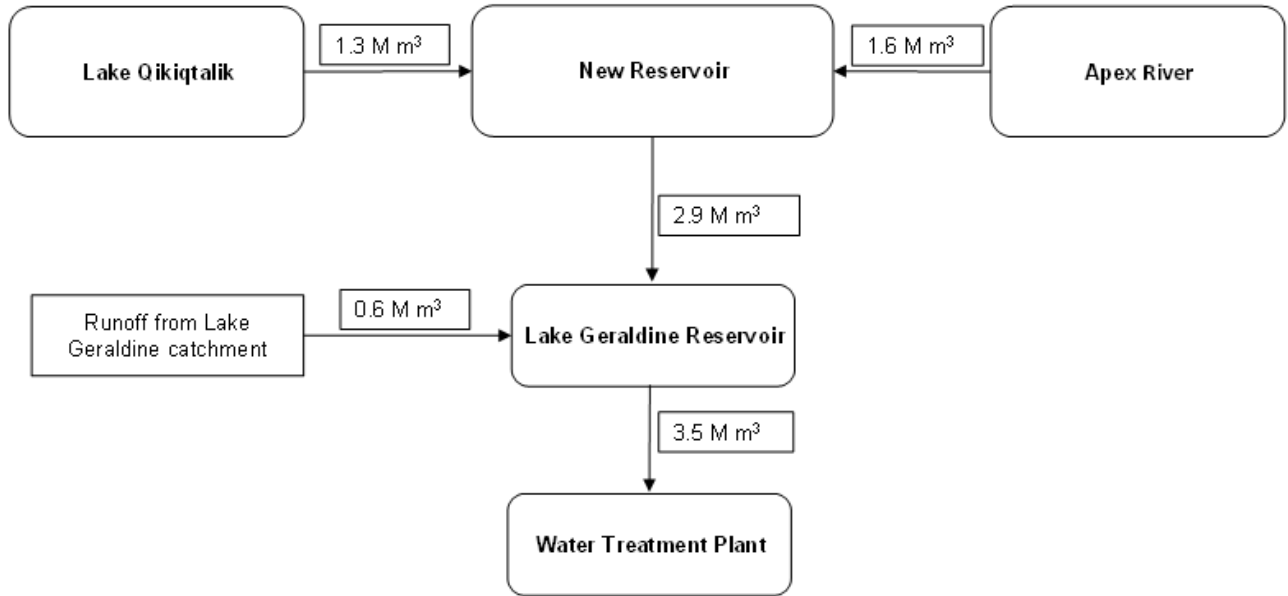


Figure 3.5 Water Supply Block Flow Diagram

Within the Lake Geraldine Reservoir, annual surface runoff and snow accumulation are estimated to contribute a total average runoff volume of 977,000 m<sup>3</sup> (Golder Associates, 2013). Under the proposed plan, the City will only be relying on about 600,000 m<sup>3</sup>/year to come from natural runoff into the Lake Geraldine catchment, compared with the original licence limit of 1,100,000 m<sup>3</sup>/year. This provides a buffer against low precipitation years impacting water levels in the Lake Geraldine Reservoir.

The City also proposes to extract smaller volumes of water using water trucks during the open water season from the four sources listed in Table 3.2 for non-domestic uses including concrete manufacture during reservoir construction, and for dust suppression during and following construction of the LTWP.

Table 3.2 Proposed Industrial Water Use

Source	Total Water Use (m <sup>3</sup> /day)
Lake Geraldine	300
Niaqunngut (Apex) River	300
Lake Qikiqtalik	300
Imiqtarviviniq (Dead Dog Lake) <sup>1</sup>	300

**Note(s):**

1. The water withdrawal from Imiqtarviviniq (Dead Dog Lake) was previously approved under Amendments No. 6 and 7.



### 3.3 LONG TERM WATER PROJECT

#### 3.3.1 PROJECT OVERVIEW

The Project will comprise three key aspects: raw water extraction, raw water conveyance, and raw water storage. The main project components are as follows:

- Raw Water Extraction
  - Lake Qikiqtalik intake and raw water pump station.
  - Niaqunngut (Apex) intake and raw water pump station.
- Raw Water Conveyance
  - Conveyance pipeline from the Lake Qikiqtalik pump station to the new reservoir, including a discharge pipe in the new reservoir.
  - Conveyance pipeline from the Niaqunngut (Apex) River pump station to the new reservoir, including discharge pipe at the new reservoir and another at Lake Geraldine.
  - Pipe bridge for river crossing at the Niaqunngut (Apex) River for new water pipelines from Lake Qikiqtalik.
  - Below grade service corridor with pipe connection and control valves between the new reservoir and Lake Geraldine including discharge pipe to Lake Geraldine.
  - Access structure to the service corridor between the new reservoir and Lake Geraldine.
- Raw Water Storage
  - Eight retention structures (one dam and seven dykes) creating the new reservoir with a perimeter road around the new reservoir.
  - One spillway from the new reservoir into the Niaqunngut (Apex) River. A second spillway may be added to the design if necessary.
- Enabling Elements
  - Upgrading as required of the existing road and culverts on the Road to Nowhere to Lake Qikiqtalik.
  - Upgrade of the existing bridge crossing the Niaqunngut (Apex) River for construction (if required).
  - New access road from the Road to Nowhere to the new reservoir requiring the dewatering and filling of three existing shallow ponds.
  - Perimeter road around the new reservoir.
  - Laydown areas near the two pump houses and shooting range including access roads.
  - Electrical utility lines to the two pump houses and the new reservoir (by QEC).
  - Backup power generators at both pump houses and the reservoir access structure and service corridor.

Temporary structures and equipment to be used during the construction phase of the Project are as follows:

- Temporary concrete plant(s).
- Quarries for rock at the new reservoir, construction laydown area and access roads.
- Borrows for sand materials, including access roads.



- Fossil fuel-fired generators for temporary power until permanent power is available.
- Trailers and Sea-Cans to serve as office and storage space onsite and at the laydown areas.
- Portable chemical toilets and wash stations.

Figure 3.6 provides an overview of the LTWP. Additional figures showing the LTWP are presented as Attachment 14.

The LTWP will be completed in several phases, as follows:

- Phase I: Project Definition and Concept Design
- Phase II: Preliminary Design Report (30% Submission)
- Phase III: Design Development (50% Submission)
- Phase IV: Final Design (90 % and 100 % Submission Milestones)
- Phase V: Tendering Support
- Phase VI: Contract Administration, Site Inspection and Engineering Support Services, during construction.
- Phase VII: Closeout Phase

The LTWP has completed Phase III, and the detailed design report is presented as Attachment 15. The various appendices of Attachment 15 are presented as Attachments 16 through 32, as listed in Table 1.2.

Issued for construction drawings completed during Phase IV will be provided to the NWB prior to construction in accordance with Part F, Item 1 of the Licence.

A brief discussion of alternatives considered leading to the development of the LTWP is provided in Section 3.3.3, and a summary of stakeholder consultation undertaken regarding the LTWP is provided in Section 3.3.4, with a more detailed consultation report presented as Attachment 33.

A description of the main components of the LTWP are provided in Sections 3.3.5 through 3.3.11.

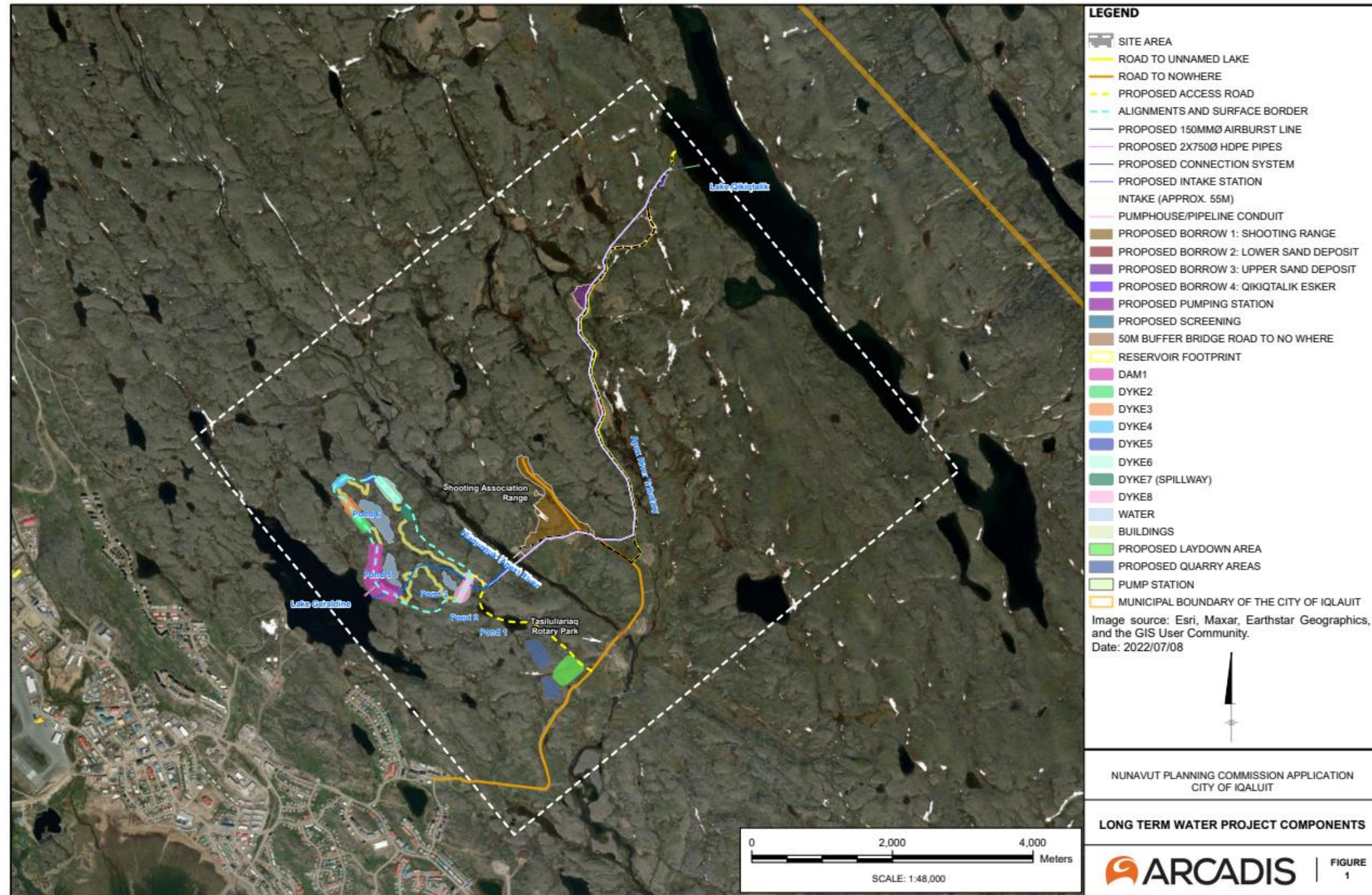


Figure 3.6 Long Term Water Project Components



### 3.3.2 ASSESSED IMPACTS OF WATER WITHDRAWALS

#### 3.3.2.1 LAKE QIKIQTALIK WITHDRAWALS

The proposed water withdrawal from Lake Qikiqtalik was assessed by Tetra Tech (2025a) and estimated that 1,284,184 m<sup>3</sup> per year (rounded to 1,300,000 m<sup>3</sup>/year in this Application) is a reasonable amount to plan for extraction from the lake. This report is presented as Attachment 34. Water quality data collected from this water source is presented as Attachment 35. A screening of environmental effects associated with the water withdrawals from Lake Qikiqtalik is provided in Attachment 36.

Based on the predicted magnitude and timing of water level changes for Lake Qikiqtalik, the following effects are assessed to potentially occur:

- **Littoral habitat:** Minor seasonal drawdown may expose portions of the shoreline; however, these changes are expected to occur gradually and within the range of natural variability. Littoral habitats in northern lakes are typically adapted to fluctuating water levels.
- **Fish habitat and use:** No rapid or large-scale drawdown is anticipated; therefore, stranding risk and loss of nearshore habitat are expected to be low. Fish species in Arctic lake systems are generally adapted to seasonal water level changes associated with ice cover, freshet, and evaporation cycles.
- **Water temperature and water quality:** Changes in water volume at the scale modelled are not expected to significantly alter thermal structure or water quality, particularly given the size of the lake and seasonal replenishment.
- **Hydrological connectivity:** Connectivity between Lake Qikiqtalik and downstream systems (e.g., Niaqunngut River) will be maintained, as withdrawals are managed and do not fully deplete storage.

The resulting changes in discharge are small relative to natural seasonal variability. Accordingly, potential effects on surface water quantity are characterized as:

- Localized and temporary
- Low magnitude
- Reversible following cessation of withdrawal

A Water Management Plan will be developed for the LTWP that outlines the mitigation measures identified through the water licensing and DFO authorization processes and establishes a program of regular monitoring of water levels in the affected water bodies. Operations will be adjusted as necessary to mitigate impacts.

#### 3.3.2.2 NIAQUNNGUT (APEX) RIVER WITHDRAWALS

The quantity of water available from the Niaqunngut (Apex) River was also evaluated by Tetra Tech (2025b). The report (Attachment 37) indicates that under average conditions and the withdrawal rules outlined below, that 1,578,096 m<sup>3</sup>/year may be available for extraction during the period when flows exceed 30% of mean annual discharge (MAD), which is typically June through October. This is the basis for the proposed 1,600,000 m<sup>3</sup>/year limit in Table 3.1. In lower flow years, less than this volume will be available for extraction considering the water withdrawal rules outlined below.



Water withdrawals from Niaqunngut (Apex) River will occur during high flows according to the following rules:

- Withdraw water only when flow of the Apex River exceeds 30% of Mean Average Discharge (MAD)
- Withdraw water at a rate of 10% of instantaneous discharge when flow of the Apex River is between 0.143 m<sup>3</sup>/s and 0.156 m<sup>3</sup>/s (between 30% and 33% of the MAD)
- Withdraw water at a rate of 20% of instantaneous discharge when flow of the Apex River is greater than 0.156 m<sup>3</sup>/s (>33% of the MAD)

These constraints limit the magnitude and timing of potential hydrological effects.

The DFO's Letter of Advice (Attachment 4) has confirmed that following the above withdrawal rules for the Niaqunngut (Apex) River, as well as other best practices, should be adequate to avoid and mitigate the potential for prohibited effects to fish and fish habitat.

The other best practices included:

- Avoid killing fish by means other than fishing; monitor for fish stranding caused by reduced water level and conduct fish rescues as needed.
- Limit the duration of in-water works, undertakings, and activities to not diminish the ability of fish to carry out one or more of their life processes (e.g., spawning, rearing, feeding, migrating).
- Ensure intake pipes are screened and sized appropriately to prevent entrainment or impingement of fish; adhere to the Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater.
- Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water) for the protection of fish and fish habitat.
- Monitor the Apex River discharge using WSC stations 10UH015 and 10UH002 to ensure water is not withdrawn when flow is below 30% of MAD.
- Develop and immediately implement a spill response plan that minimizes risk of deleterious substances from entering a watercourse or water body and ensure containment kits are available during all phases of the pumping.

The resulting changes in discharge are small relative to natural seasonal variability. Accordingly, potential effects on surface water quantity are characterized as:

- Localized and temporary
- Low magnitude
- Reversible following cessation of withdrawal



The following are assessed effects from changes in surface water quantity on aquatic habitat:

- **Water depth and wetted habitat:** Reductions in discharge of  $\leq 10\text{--}20\%$  during high-flow conditions are not expected to meaningfully reduce wetted channel area or isolate habitat units. During freshet conditions, channel capacity is high and habitat availability is not limiting.
- **Flow velocity and habitat structure:** Minor, proportional reductions in velocity may occur locally; however, these changes are expected to remain within the natural range of variability and are not anticipated to alter substrate stability or channel morphology.
- **Fish passage and connectivity:** Because withdrawals are restricted to periods when flows exceed 30% MAD, minimum ecological flow thresholds are maintained. As such, fish passage and longitudinal connectivity are expected to be preserved.
- **Seasonal sensitivity:** Withdrawals are limited to spring freshet, a period when fish are adapted to high and variable flows; and habitat availability is naturally expanded. Therefore, the relative ecological sensitivity to flow reductions is low compared to low-flow periods.

Overall, the magnitude of hydrological change is not expected to result in measurable loss or degradation of aquatic habitat functions (e.g., spawning, rearing, migration).

As noted above, a Water Management Plan will be developed or the LTWP that outlines the mitigation measures identified through the water licensing and DFO authorization processes and establishes a program of regular monitoring of water levels in the affected water bodies. Operations will be adjusted as necessary to mitigate impacts.

### 3.3.3 ALTERNATIVES CONSIDERED

The City and its consultants have engaged in an iterative process to identify the best solution to meet its current and future water supply needs. The alternatives for raw water supply for the Project included:

- Desalinization of sea water pumped from Frobisher Bay
- Pumping water from the Sylvia Grinnell River to Lake Geraldine
- Damming of the Niaqunngut (Apex) River or other water courses
- Extracting water from Lake Qikiqtaalik by truck temporarily under emergency conditions
- Extracting water from Niaqunngut (Apex) River by a temporary pipeline under emergency conditions
- Transferring water via a permanent pipeline from Lake Qikiqtaalik to a new reservoir to be constructed adjacent to Lake Geraldine
- Transferring water via a permanent pipeline from Niaqunngut (Apex) River via permanent pipelines to the new reservoir and Lake Geraldine, to augment the Lake Qikiqtaalik water source
- Constructing a new reservoir at Lake Qikiqtaalik and a new water pipeline to transfer water to Lake Geraldine

The alternative being put forth in this Application was selected based on technical feasibility, cost, and the need for a long-term solution out to 2050.



### 3.3.4 STAKEHOLDER ENGAGEMENT ON THE LTWP

The City of Iqaluit undertook various consultation activities regarding its LTWP between 2023 and 2025, as summarized in Table 3.3. A Consultation Report is included as Attachment 33.

Table 3.3 Stakeholder Engagement Summary

Organization	Dates/Location
Nunavut Impact Review Board (NIRB)	February 6, 2023 (virtual), July 18, 2023 (virtual), March 04, 2024 (virtual), and November 1, 2024 (virtual)
Nunavut Water Board (NWB)	March 13, 2023 (virtual), April 27, 2023 (in person), February 26, 2024 (virtual), November 7, 2024 (virtual), and April 30, 2025 (virtual)
Fisheries and Oceans Canada (DFO)	March 22, 2023 (virtual) and October 30, 2024 (virtual)
Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	March 22, 2023 (in-person and virtual), February 28, 2024 (virtual), and October 30, 2024 (virtual), and June 23, 2025 (in-person)
Qikiqtani Inuit Association (QIA)	March 23, 2023 (virtual), April 27, 2023 (in-person), and October 29, 2024 (in-person)
Public: open houses	June 7 and 9, 2023 and November 27 and 28 2024
Nunavut Tunngavik Incorporated (NTI)	April 27, 2023 (in-person)
Nunavut Planning Commission (NPC)	April 28, 2023 (virtual), October 12, 2023 (in-person), and October 29, 2024 (in-person)
Government of Nunavut (GN), Dept. of Environment	April 28, 2023 (in-person), and November 28, 2024 (in-person)
GN Depart. of Culture and Heritage	March 23, 2023 (virtual)
GN Depart. of Health	May 01, 2023 (virtual), and November 27, 2024 (in-person)
GN Climate Change Secretariat	December 18, 2023 (virtual), and November 01, 2024 (virtual)
Nunavut Research Institute	June 7, 2023 (virtual), and November 28, 2024 (in-person and virtual)
Hunters and Trappers Association (HTA)	June 8, 2023 (in-person) and March 19, 2025 (in-person)
Qulliq Energy Corporation (QEC)	October 18, 2024 (virtual), and March 17, 2025 (in-person)
Iqaluit Shooting Association	March 18, 2025



### 3.3.5 LAKE QIKIQTALIK RAW WATER INTAKE AND PUMP STATION

A raw water intake and pump station will be constructed in and next to Lake Qikiqtalik. The intake at Lake Qikiqtalik will provide raw water to a pump station on the west shore of Lake Qikiqtalik. The intake will be a 750 mm high density polyethylene (HDPE) DR 11 pipe extending into Lake Qikiqtalik, into a minimum of 8 m water depth. The intake will be 4 m below the assumed 2 m of ice expected to be present during winter, as measured from the design low water level of 202.1 m. Design drawings are provided in Attachment 16.

The intake will have a screen that is sized in accordance with the *Freshwater Intake End-of-Pipe Fish Screen Guidelines* (DFO, 1995) for the fish that may be present in Lake Qikiqtalik. Previous studies identified the presence of Arctic Char in Lake Qikiqtalik however, Ninespine Stickleback may also be present. Using a screen approach velocity of 0.11 m/s per the DFO guidelines, a screen with a clear area of 4.82 m<sup>2</sup> is required to prevent entrainment and impingement. The screen slot size will be no larger than 2.54 mm in accordance with the DFO guidelines.

The screen will be fitted with an air scour system that is operated by an airline running in parallel with the raw water line and connected to a compressor in the pump station. The air scour is designed to operate at programmed, adjustable intervals in winter to mitigate frazil ice or in bursts to control biofouling.

The raw water intake screen design is for a flow of 556 L/s with an inlet flow velocity of 0.11 m/s. The screen will be a “TEE” type, 914 mm in diameter, with an overall length of approximately 3.56 m long with #69 wire screen providing a slot size of 2.54 mm. The screen will be equipped with a 750 mm flanged outlet and a 150 mm airburst connection. All material will be 316 stainless steel which is marine grade with superior corrosion resistance.

### 3.3.6 NIAQUNNGUT (APEX) RIVER RAW WATER INTAKE AND PUMP STATION

A raw water intake and pump station will be constructed in and next to Niaqunngut (Apex) River. The river flows in a north-to-south direction. To effectively manage and capture water flow in its shallow environment, an intake crib is proposed to be constructed adjacent to the riverbank. Water will enter the intake crib through two slide gates located on the north side. Once inside, the flow will follow one of two paths:

- Screened Flow Path: Water passes through intake screens and is directed to the wet well for further processing.
- Bypass Flow Path: Water bypasses the screens and exits the crib via two downstream slide gates positioned on the south side.

During non-pumping seasons, all slide gates will remain closed to prevent ice formation within the crib structure thereby protecting internal components and maintaining operational integrity. Figure 3.7 presents a general layout of the intake crib and screens. Design drawings are provided in Attachment 16.

The intake screen is sized in accordance with the *Freshwater Intake End-of-Pipe Fish Screen Guidelines* (DFO, 1995) for Arctic Char, which have been confirmed to be present in the Apex River. Arctic Char have a subcarangiform mode of swimming. Using a screen approach velocity of 0.11 m/s per the DFO guidelines, a screen with a clear area of 3.64 m<sup>2</sup> is required for a flow rate of 400 L/s to prevent

entrainment and impingement. The screen openings will be no larger than 2.54 mm in accordance with the DFO guidelines. The intake itself consists of two retractable self cleaning cylinder screens. The cleaning is accomplished by rotating a screen cylinder between internal and external brushes. The internal mechanism that turns the barrel can either be electrically driven, or propeller driven (using the river's flow through the barrel to turn the screen). These options will be explored further during detailed design. During the non-pumping seasons, the intake screens can be removed from the water to prevent damage via built-in lifting mechanisms. The screens would then need to be lifted onto a crib and taken in to be stored. The cylinder screens are also equipped with blanking plates to seal off the openings when the screens are lifted during the non pumping seasons.

The Niaqunngut (Apex) River, Lake Geraldine, and Lake Qikiqtalik will have in-water works to complete construction of inlet/outlet piping for water taking and discharge. The intake/outlet pipes will require alteration to the localized area where constructed, as will be outlined in the design drawings. DFO will be consulted on these required alterations. Otherwise, these water bodies will not be changed from their existing condition.

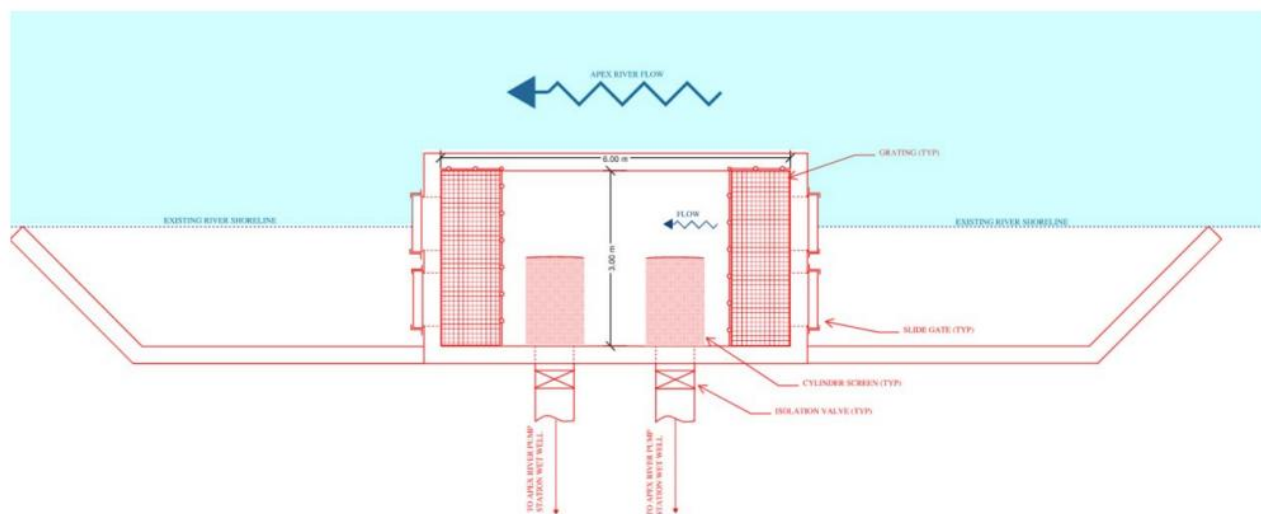


Figure 3.7 Niaqunngut (Apex) River Intake Crib Layout

### 3.3.7 WATER STORAGE

As part of the undertaking there is a water storage facility, which is a New Reservoir east of Lake Geraldine. It will have a capacity of 1,834,300 m<sup>3</sup>. The reservoir system comprises eight retention structures in addition to peripheral utilities (e.g., access road). The basic characteristics of each are summarized in Table 3.4, and the preliminary layout is presented as Figure 3.8. Design drawings are presented in Attachment 16.

The dams and dykes are to be designed considering all applicable loadings under end of construction, operating, and seismic conditions. As per Table 6-2 and 6-3 of the CDA guidelines, the required minimum Factors of Safety (FoS) are outlined in Tables 3.5 and 3.6.



*Table 3.4 Dam Structure Characteristics*

Structure	Number	Max Height* (m)	Approximate Length (m)
<b>Dam</b>	1	12.0	370
<b>Dyke</b>	2	5.0	100
<b>Dyke</b>	3	5.0	130
<b>Dyke</b>	4	4.0	90
<b>Dyke</b>	5	3.5	45
<b>Dyke</b>	6	10.0	190
<b>Dyke (Spillway)</b>	7	At existing grade	75
<b>Dyke</b>	8	9.0	170

*Table 3.5 Factor of Safety Through Operations*

Loading Condition	Minimum FoS	Slope
<b>End of construction (prior to filling)</b>	1.3	Upstream and downstream
<b>Long- term (steady state, normal reservoir level)</b>	1.5	Upstream and downstream
<b>Full or partial rapid drawdown</b>	1.2 - 1.3	To be completed once material properties have been obtained through laboratory testing

*Table 3.6 Factor of Safety Through Seismic Activity*

Loading Condition	Minimum FoS
<b>Pseudo-static</b>	1.0
<b>Post-earthquake</b>	1.2 - 1.3

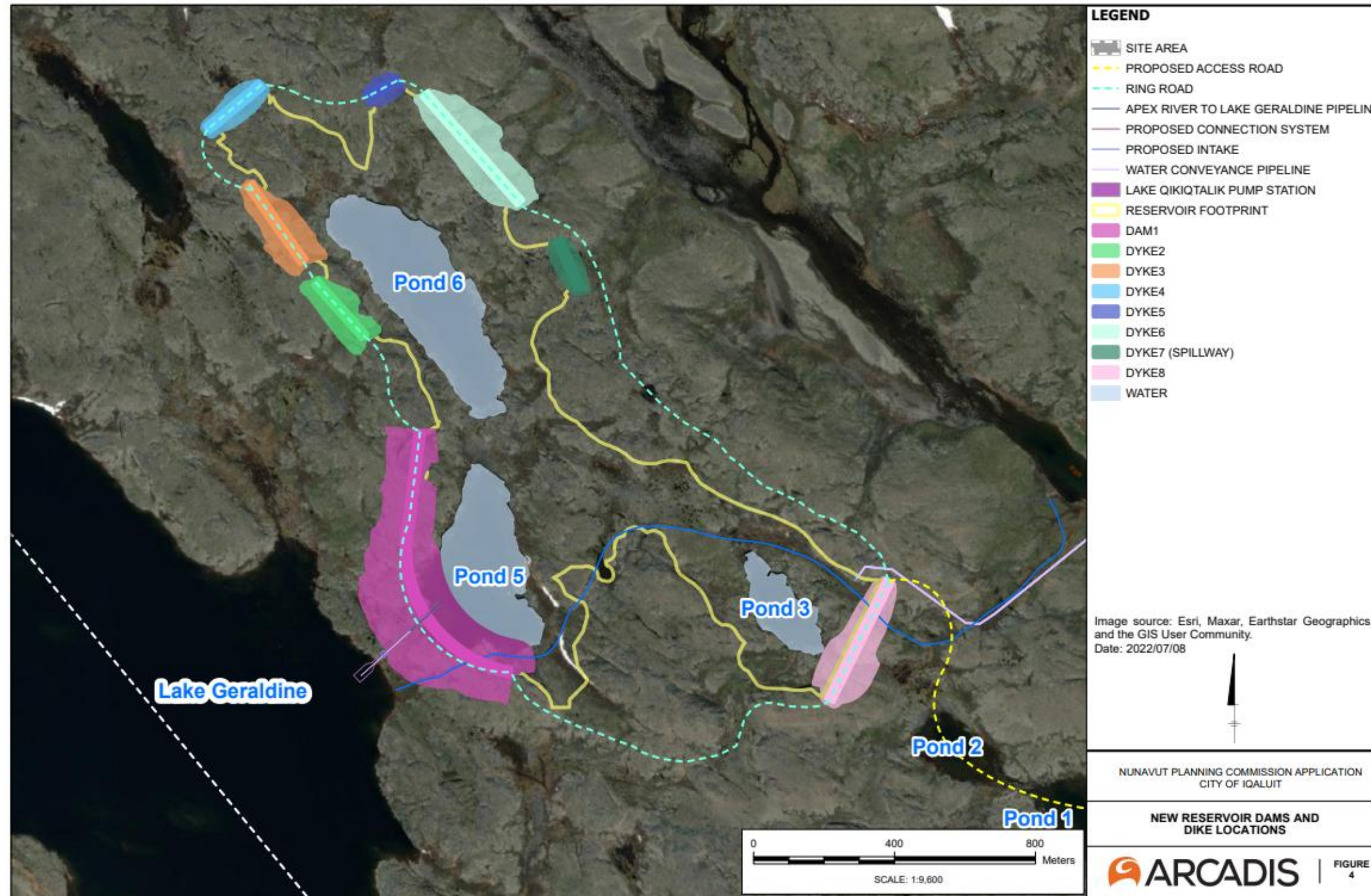


Figure 3.8 Preliminary Layout of the New Reservoir



The following information and limitations have also been considered in the design:

- Construction is expected to be a staged process over about three years (2027 to 2029).
- The new reservoir will have a relatively small catchment area; the majority of inflow will be from the pipeline conveyance from Lake Qikiqtalik and the Niaqunngut (Apex) River and thus controlled.
- Reservoir filling will be conducted during the ice-free months, any inputs outside this period will be from precipitation events and the spring freshet.
- The reservoir will be steadily discharged over the course of the winter to Lake Geraldine to prevent it from falling below a target elevation.
- The new reservoir will likely not reach full operating level in the first year of operation – filling is anticipated to be a staged process.
- The crest of the dam and dykes will be used for vehicle travel. Crest width has been specified at 10 m.
- The dam and dykes will be founded on bedrock, with founding surface preparation as necessary.
- Suitable on-site and/or locally available materials can be used for the dam, dyke and access road construction. Blasted rock from the excavation will need to be further crushed and/or graded to meet material specifications for the internal cushion layers.
- Spillway locations and designs are to direct flow away from the Lake Geraldine catchment area.
- Seepage through the rock-fill dam and dykes will be minimized via the use of an impermeable liner on the upstream slopes, anchored to the bedrock.
- Bedrock surfaces under the geosynthetic liner contact zone will be appropriately treated with slush grout or similar surface dressing. Surface irregularities, cavities, or overhangs will be treated by reshaping using dental concrete, as required.
- Shoreline protection will be instituted through use of rip rap at discharge points, the dykes, and the spillway, as well as the liners and membranes noted above.
- A seepage management system will be installed at each retaining structure.
- Snow capture measures have not been considered as the potential volume is not expected to be significant.
- A severe wind speed of 216 km/h is noted for the Region and has been used in design calculations (e.g., wave height calculations). CSA S505:20 for considerations for high winds and snow drifting has been reviewed and will continue to be referenced during the subsequent design phases.

### **3.3.8 CONVEYANCE PIPELINES**

This project has three main conveyance pipelines:

1. Conveyance pipeline from Lake Qikiqtalik to New Reservoir, to facilitate filling New Reservoir.
2. Conveyance pipeline from Niaqunngut (Apex) River with outlet at New Reservoir and Lake Geraldine, to facilitate filling New Reservoir or Lake Geraldine.
3. Interconnection from New Reservoir to Lake Geraldine, to facilitate filling Lake Geraldine.

Design drawings are presented in Attachment 16. Brief descriptions of each conveyance pipeline are provided below.



### **3.3.8.1 CONVEYANCE PIPELINE, LAKE QIKIQTALIK TO NEW RESERVOIR**

A 600 mm HDPE DR11 Raw Water Transmission Main (RWTM) is proposed, running from the Lake Qikiqtalik pump station to a valve chamber where it splits via a wye connection into two parallel 400 mm HDPE DR11 RWTMs.

The pipes will follow the route of the existing roads where feasible. They will be laid on the existing ground that will be slightly sub-excavated following clearing and grubbing (if applicable), bedded, and covered/backfilled with selected material to construct a berm for protection. The depth of cover will be 1.0 m layer on top and extend 2.5 m on either side, in the form of a berm of sand, wrapped with geotextile, and crushed stone.

The total length of the 600 mm pipe is estimated to be approximately 65 meters, while each of the two parallel 400 mm pipes will have a total length of approximately 3.9 kilometers.

### **3.3.8.2 CONVEYANCE PIPELINE, NIAQUUNGUT (APEX) RIVER TO NEW RESERVOIR**

Two 400 mm HDPE DR11 RWTM are proposed from the Niaquungut (Apex) River with distinct routes.

Route 1 is proposed to run from the Niaquungut (Apex) River pump station to the new reservoir with an approximate length of 286 meters.

Route 2 is proposed to convey raw water from the Niaquungut (Apex) River pump station to a valve chamber. At this chamber, the flow can be directed based on operational requirement to either the new reservoir via approximately 500 meters of 400 mm HDPE DR11 RWTM or to Lake Geraldine via approximately 800 meters of HDPE DR11 RWTM.

Where feasible, the proposed pipelines will be aligned along existing road corridors to enhance accessibility and reduce environmental disturbance. Installation will involve minor sub-excavation of the existing ground surface, following clearing and grubbing as necessary. The pipelines will be placed on prepared bedding and backfilled with selected material to form a protective berm.

### **3.3.8.3 SERVICE CORRIDOR, NEW RESERVOIR TO LAKE GERALDINE**

Two 750 mm HDPE pipes will be used to connect the reservoirs and will provide redundancy. To facilitate access for personnel, the two 750 mm pipes will be housed within a 3000 mm steel pipe with a thickness of 19 mm. Part of the bottom of the steel pipe will be filled with grout to provide a level surface, facilitating the placement of the pipes inside and allowing personnel access. This entire assembly will be positioned within a trench and encased with concrete to reinforce the steel pipe, ensuring it can effectively withstand both live and dead loads. The service corridor will be maintained at a minimum temperature to prevent freezing. Heat trace may be required on portions of the pipe (i.e., at entrance/exit), which will be further evaluated.

Manual isolation valves inside the service corridor will serve as backup and double isolation for maintenance purposes. Level monitoring will be provided for both Lake Geraldine and the new reservoir. Actuated valves will be used to control filling of Lake Geraldine based on the water level readings, with the goal to maintain the reservoir within a working range to be finalized with the City, but no greater than 111.3 m. Level monitoring and valve control will be similar to that of the pump station and will be accessible through the City's SCADA system. Drain valves will also be included in the enclosure.



A diffuser pipe arrangement will discharge water into Lake Geraldine and will be situated below expected freezing level to protect the pipe from being damaged. An intake structure in the new reservoir will be required to support the inlet location.

### 3.3.9 DEWATERING OF PONDS

Five ponds will be dewatered during construction, as they are located within the project footprint (Figure 3.9). eDNA testing of Ponds 1, 2, 3, 5 and 6 conducted between July 15 and 19, 2024 all showed negative results for fish presence, strongly suggesting there are no fish species inhabiting these waterbodies (Attachment 36).

Each of the ponds will be dewatered during construction, with the water discharged such that it will runoff into Lake Geraldine.

Two small unnamed ponds (Ponds 1 and 2 on Figure 3.9) located within the access road alignment to the new reservoir will be dewatered and infilled as part of road construction. Additionally, three small unnamed ponds within the footprint of the new reservoir (Ponds 3, 5 and 6 on Figure 3.9) will also be dewatered and then incorporated into the New Reservoir once filled.

Based on the specification of a typical mobile water pump expected to be used, the rate of dewatering is estimated to at  $485 \text{ m}^3/\text{h} \times 10 \text{ hours per day} = 4,850 \text{ m}^3/\text{day}$ .

### 3.3.10 ACCESS ROADS AND WATER CROSSINGS

Access roads for operation and maintenance of the new water supply system are either existing or will be constructed as needed. These roads are shown on Figure 3.6.

To support construction of the new water supply facilities, new or upgraded water crossings will be required as follows:

- Pipe bridge for river crossing at the Niaqunngut (Apex) River for new water pipelines.
- Upgrading as required of the existing road and culverts located between Lake Qikiqtalik and the Road to Nowhere.
- Upgrades of the existing bridge crossing the Niaqunngut (Apex) River for construction (if required).

Design drawings are provided in Attachment 16. Issued for construction drawings will be provided for these crossings when available.

### 3.3.11 PUMPING OPERATION

Reservoir filling time approximately 3-4 months. This will be achieved with peak pumping during the Spring freshet and lower pumping rates during subsequent months until the reservoir volume is reached. Pumping rates at Lake Qikiqtalik will be 556 L/s (two pumps running) during spring freshet and approximately 278 L/s (one pump running) during lower flow months. Two pumps will pump an additional 400 L/s from the Niaqunngut (Apex) River.

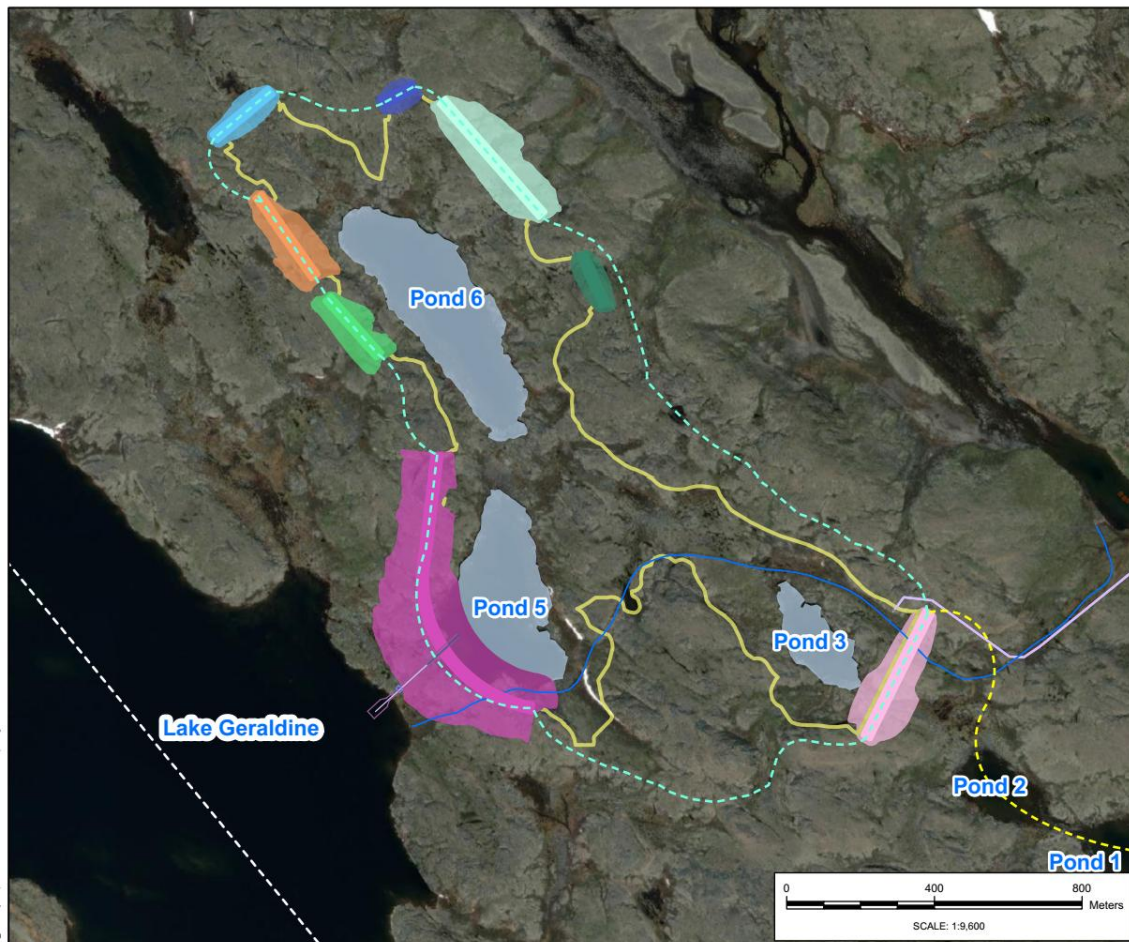


Figure 3.9 Ponds Requiring Dewatering During Construction

## 4.0 WASTE DISPOSAL (PART E)

### 4.1 WASTEWATER TREATMENT FACILITIES

#### 4.1.1 WASTEWATER TREATMENT PLANT

The current WWTP was commissioned in 2020. A very comprehensive process-mechanical O&M manual governs the operation of the facility (Attachment 43). A Draft Control Narrative that formed part of a modification request submitted to the Board to upgrade the WWTP in 2018 provides a more comprehensible overview of the WWTP (Attachment 44). The overall process was selected to ensure a low cost, robust system that could be installed within the limited space of the existing building. The location of the WWTP relative to the sewage lagoon is shown on Figure 4.1.



Figure 4.1 Sewage Lagoon Layout

Sewage is collected in several ways within the City of Iqaluit. Within the core parts of the city, many larger and newer buildings are connected to aboveground piped utilidors, and sewage is gravity-fed or pumped to the WWTP. Much of the city, however, is on trucked sewage. Honey bags are still used by older or remote dwellings and temporary shelters without plumbing or tanks. Sewage that is trucked is discharged into a dump station manhole upstream of the WWTP. Only domestic sewage is received at the WWTP (i.e., no commercial or industrial liquid waste is accepted).

The wastewater treatment plant consists of primary and secondary treatment. The primary treatment process consists of a wet well equipped with influent pumps, auger screens, and a primary filter (Salsnes Filter). The



secondary treatment process consists of two trains of moving bed biofilm reactors (MBBR), which is preceded by two dissolved air flotation (DAF) units with polymer addition. Following secondary treatment, the treated effluent is pumped to an outfall to Koojesse Inlet, located adjacent to the sewage lagoon outflow valve. The facility has been designed to process up to 151 L/s, which is the forecasted peak hour flow in 2041 (Attachment 44).

The upgraded and fully commissioned primary treatment systems were brought online in April 2019. The Contractor was granted partial substantial completion for the primary treatment systems on to April 10, 2019. Secondary treatment construction activities were completed, less deficiencies, in March 2020. The secondary treatment 28-day commissioning activity commenced in mid-March 2020 following the completion of secondary treatment construction activities. With concerns related to the emerging COVID-19 pandemic cited, the incumbent Contractor demobilized staff from Site in late March 2020 with final commissioning activities incomplete.

The Contractor (and their subcontractors / suppliers) resumed commissioning activities for the secondary treatment system in January 2021, following remobilization to site. Onsite commissioning works for the secondary treatment systems were completed in April 2021 and the Engineer overseeing the work provided initial confirmation to the City that commissioning results were within design parameters in June 2021. As a result, the Contractor was granted substantial completion for the secondary treatment work dated back to March 15, 2021.

Since that time, the City has experienced breakdowns in the primary treatment systems and is continually working with equipment suppliers, consultants and contractors to resolve ongoing issues within both the primary and secondary treatment systems. These issues have previously impacted effluent quality discharged into the environment; however, we are pleased to note no discharges have occurred during this reporting period. Previous issues/breakdowns with the primary and secondary treatment systems have been corrected and both primary and secondary treatments are closely monitored. Effluent quality has been improved and is being maintained to meet the guidelines. Also, the City previously notified Environment and Climate Change Canada of these ongoing challenges, and met with ECCC representatives on November 30, 2021, following submission of the Q3, 2021 Compliance Report. The City has also provided regular updates with the most recent 2024 Q2, Q3, Q4 and 2025 Q1 Compliance Report.

The plant is presently running treatment through both DAFs; however, the sludge press and TWAS tank end of the treatment lines are presently not energized and we are working with the City is working with its subject matter experts to get this corrected and programmed properly into the WWTP SCADA network. It is anticipated this will be completed by end of Q2 of 2026 pending any unforeseen technical issues.

To address some ongoing HVAC issues which are going to keep impacting the lifecycle of the electrical systems, the City has engaged a third-party engineering consultant to review air movement, air quality, and HVAC capacity requirements for the WWTP. Detailed design will follow along with HVAC upgrades to address any issues with an anticipated completion date of mid-2027. Humidity, corrosion prevention and staff comfort/safety are the main issues to be improved with this overall project.



Since early Q2 2023, the City has two certified wastewater treatment plant operators with the following certifications;

- One Level 2 Wastewater Treatment working towards the next level
- One Level 1 Wastewater Treatment working towards the next level
- Both with Level 1 Wastewater Collection

They both have experience with similar WWTP Treatment technology. With their experience and management dedication, they have brought the WWTP well within the required effluent parameters where it continues to operate today. The City also continues to actively search for additional fully certified operator.

The WWTP is a major priority of the City which continues to invest heavily in its operation and maintenance efforts having spent in excess of \$1,200,000.00 on repairs, maintenance and upgrades in 2025. A capital budget of \$900,000.00 (excluding salaries) has been allocated to the WTP for the 2026 year, with over \$400,000 already committed. Engineering and Public Works staff continue to review long-term needs with several major improvements in the works such as ongoing utilidor capacity upgrades throughout the City to meet ongoing and future growth, replacement of Lift Station #1 in 2026/27, a new truck sewage receiving station, sludge handling improvements for the lagoon, and a pre-treatment facility for the WWTP itself. These improvements will all aid the WWTP in continuing to meet the effluent quality discharge limits. Completion of these types of projects continue to be impacted by access to funds, availability of consultants and contractors, equipment and material long lead times associated with the remote location of Iqaluit. In total,

The City continues to focus on finalizing the remaining upgrade works and is fully committed to making sure effluent discharge limits are continuously improving and or meeting requirements. Issues with Ventilation impacting Electrical component lifespans are being assessed with an experienced consultant with some capital improvements planned in late 2026 and 2027. The polymer reseeding continues to be monitored constantly.

The thickened waste activated sludge generated during treatment is dewatered using a belt filter press, collected in a trailer, and hauled to the West 40 Landfill every two days. Currently, however, the belt filter press is not operational, and thus the waste activated sludge is being pumped to the sewage lagoon. Plans are in motion for replacement of the belt filter press.

In 2025, the City discharged 1,314,673 m<sup>3</sup> of treated sewage effluent from the WWTP. Greywater generated within the municipality treated in the WWTP and is included in that total volume. About 512 m<sup>3</sup> of sludge generated at the WWTP was disposed of in the West 40 Landfill.

#### **4.1.2 SEWAGE LAGOON**

The sewage lagoon is located adjacent to the Iqaluit WWTP, to the west of the City. It is a single-celled, naturally aerobic lagoon which has a current handling capacity of 25,000 m<sup>3</sup>. The effluent from the lagoon flows into a low-lying area, which eventually discharges to Koojesse Inlet approximately 1.1 km away. A layout of the site is shown in Figure 4.1, and the Sewage Lagoon O&M Manual is presented as Attachment 45.



Currently, all influent sewage flows are being directed to the WWTP. Commercial/industrial effluent from the local brewery is accepted at the sewage lagoon. The main purpose of the sewage lagoon since commissioning the WWTP is to act as a bypass/overflow system for the WWTP, should the plant experience an unexpected shutdown where it must divert away from the plant. The sewage lagoon is considered an intermittent discharge lagoon, as the lagoon is in operation only while the WWTP is unavailable.

Flow can be diverted to the sewage lagoon by closing the upstream isolation gate located within the truck discharge manhole and opening the isolation gate to the sewage lagoon within the same manhole.

When the sewage lagoon is required to be in operation, it will be operated in one of two methods:

1. Filling the lagoon and intermittently discharging effluent. The lagoon is discharged at a semi-constant rate through an effluent pipe located within a coarse rip-rap section of the west berm. Effluent quality is tested prior to releasing through the lagoon outfall.
2. Overland pumping from the lagoon back to the WWTP, via the truck dump station upstream of the WWTP wet well. This method is subject to the WWTP coming back into operation prior to the sewage lagoon completely filling.

The sewage lagoon facility has no operable controls, systems and/or components, apart from the outlet control valve and structure near the west berm. The outlet control valve may be used to regulate the level in the lagoon. The lagoon is an older retaining structure built on “leaky dam” technology, which signifies that there is no liner for the lagoon and no significant operating controls or components; The pervious nature of the berms allows for percolation through the berm section.

While the sewage lagoon has largely not been required for sewage treatment since the WWTP was commissioned, it has been necessary in recent months to discharge thickened waste activated sludge from the WWTP to the lagoon, because the belt filter press has not been working properly to dewater sewage sludge generated within the WWTP.

### **4.1.3 SEWAGE SLUDGE MANAGEMENT**

Sewage sludge generated by the WWTP is dewatered using a belt filter press and the dewatered sludge is transported to the West 40 Landfill about every second day. In 2025, 512 m<sup>3</sup> of sludge were removed from the facility and disposed of at the City’s West 40 Landfill. As noted above, the belt filter press in the WWTP is not currently functioning, and a bypass solution has been to pump the waste activated sludge to the sewage lagoon.

If the sewage lagoon is being used for sewage treatment, sludge slowly accumulates at the bottom of the sewage lagoon. Under this operating scenario, sludge removal is required every 10 to 15 years. The sludge removal process involves slurring the accumulated sludge, adding a polymer to assist with dewatering, and placement of the sludge slurry into geotubes for dewatering. This process is described in more detail in the Sewage Lagoon O&M Manual (Attachment 45).

With the recent discharge of waste activated sludge to the sewage lagoon, sludge removal may be required sooner than is typical.



## 4.2 SOLID WASTE FACILITIES

The City of Iqaluit's long-term plans for solid waste management were described in its 2014 Solid Waste Management Plan, submitted under Part E, Item 9 of the current licence (Attachment 46).

The City's current solid waste management facilities and sewage treatment and disposal facilities include:

- West 40 Landfill
- North 40 Landfill
- Waste Transfer Station
- Sewage treatment plant
- Sewage lagoon

No changes to the current waste disposal are being proposed with this Application.

### 4.2.1 WEST 40 LANDFILL

The West 40 Landfill has been in operation for several decades, and continues to operate today, though its closure is anticipated in the next few years once it reaches capacity. Its location is shown on Figure 1.1, and the layout is presented as Figure 4.2. Solid waste management facilities at the West 40 Landfill include:

- A site office and garage
- Scrap metal area
- Scrap tire collection area
- Household hazardous waste depot
- Leachate holding pond
- Retention Ponds 1 and 2 (additional leachate storage)
- White metal collection area
- E-waste collection area
- End-of-life vehicle decontamination area

Hazardous waste is stored in secondary containment within shipping containers in the North Drainage Area (Figure 4.2). E-waste is stored in separate shipping containers in the same area. The end-of-life vehicle decontamination area is located next to the Quonset building. Once a vehicle has been decontaminated, all hazardous waste is relocated to the hazardous waste storage area in the North Drainage Area. Tires associated with the end-of-life vehicles are temporarily stored in this area, with longer-term storage of tires being in shipping containers in the hazardous waste storage area. The scrap metal area and white metal collection area are at the southern end of the landfill.

The landfill is surrounded by berms and a fence to contain the waste. In 2024/2025, the City invested in additional portable fencing with was deemed effective in the latest CIRNAC inspection (Attachment 7b).

In 2025, approximately 36,636 m<sup>3</sup> of waste was deposited at the West 40 Landfill. The City estimates that two to three years of capacity remains in the West 40 Landfill.

The West 40 Landfill O&M Manual (Attachment 47) describes its operation, and a decommissioning technical memorandum developed in 2014 provides initial closure concepts (Attachment 48). A key issue to be addressed during closure is future subsidence of the waste due to its high elevation and low compaction. The City plans to file a Final Closure and Reclamation Plan at least one year prior to closure of the West 40 Landfill, in accordance with Part J Item 2 of the Licence.

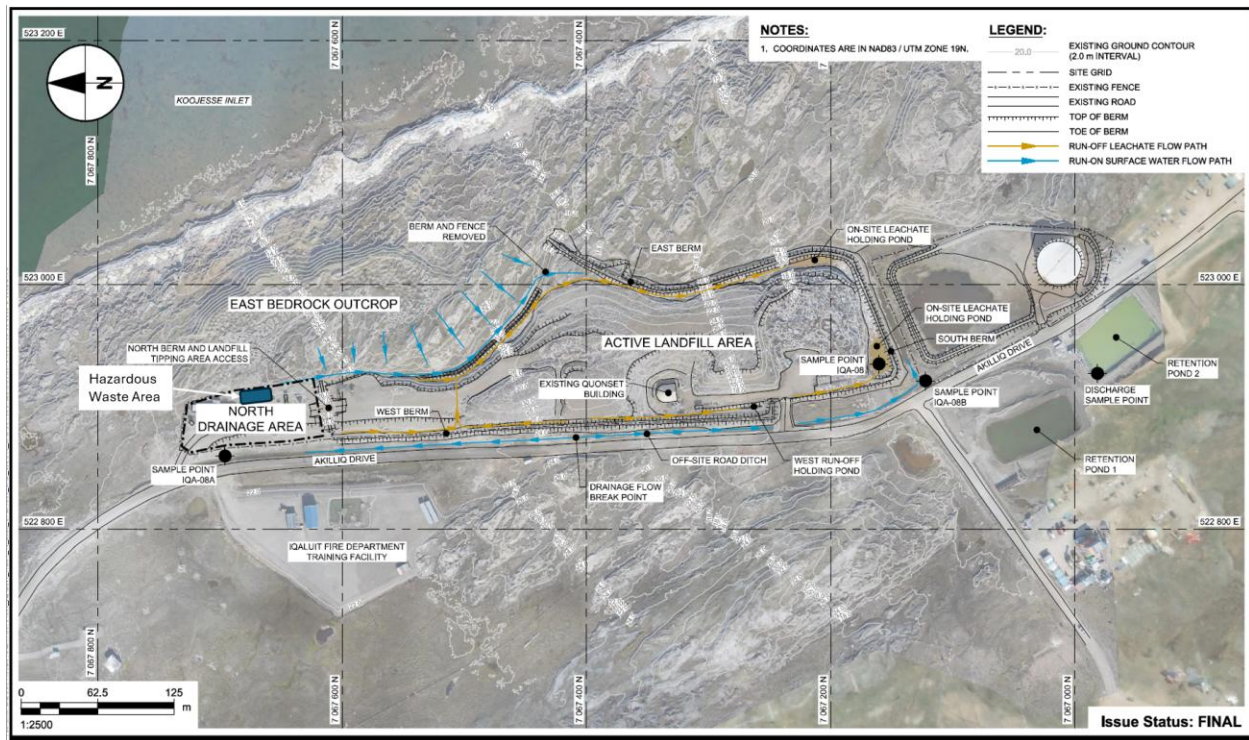


Figure 4.2 West 40 Landfill Site Layout

#### 4.2.2 NORTH 40 LANDFILL AND WASTE TRANSFER STATION

New solid waste management facilities have been designed and constructed in 2023 and 2024 in anticipation of the closure of the West 40 Landfill. The facilities are not yet operational.

The North 40 Landfill and Waste Transfer Station were added into the scope of the current Licence in Amendment No. 5 of the current Licence in 2021. Issued for Construction drawings of these facilities were submitted to the Board in 2022 in accordance with Part F, Item 1 of the Licence.

The North 40 Landfill cell and treatment lagoon construction was successfully completed in 2024. This includes the final grading of the first cell of the landfill, the leachate treatment pond, roads and surroundings, along with the installation of the cell and lagoon liners and cover materials and perimeter fencing (Figure 4.3). The leachate handling, pumping and conveyance equipment are yet to be installed.

The Waste Transfer Facility was also constructed, including all equipment installations and related startups, mechanical, electrical and fire protection systems (Figure 4.4). Substantial Completion was approved in early

2025 once the fire protection system was fully commissioned and certified by the respective certification and approval agency.

Construction summary reports with as-built drawings of the North 40 Landfill and Waste Transfer Station is being submitted to the NWB with this Application (Attachments 49 and 50).



Figure 4.3 North 40 Landfill – Cell 1 and Ultimate Footprint

The City Last expects to contract a third party to operate/manage the waste collection, processing and landfilling operations. Once the new facilities are operational, municipal solid waste will be received at the Waste Transfer Station where it will be compacted and baled before placement in the North 40 Landfill. This approach will maximize use of space in the landfill.



The North 40 Landfill has a projected capacity of 75 years. Cell 1 that has been constructed will have sufficient capacity for five years.

An O&M Manual for the North 40 Landfill and Waste Transfer Station is presented as Attachment 51. A leachate collection and characterization plan, previously submitted to the Board in accordance with Part E, Item 23 of the licence, is presented as Attachment 52. A closure and decommissioning plan for both facilities is Attachment 53. An Environmental Management Plan and an Environmental Protection Plan were developed specific to the operation and closure of the North 40 Landfill and Waste Transfer Station (Attachments 54 and 55).

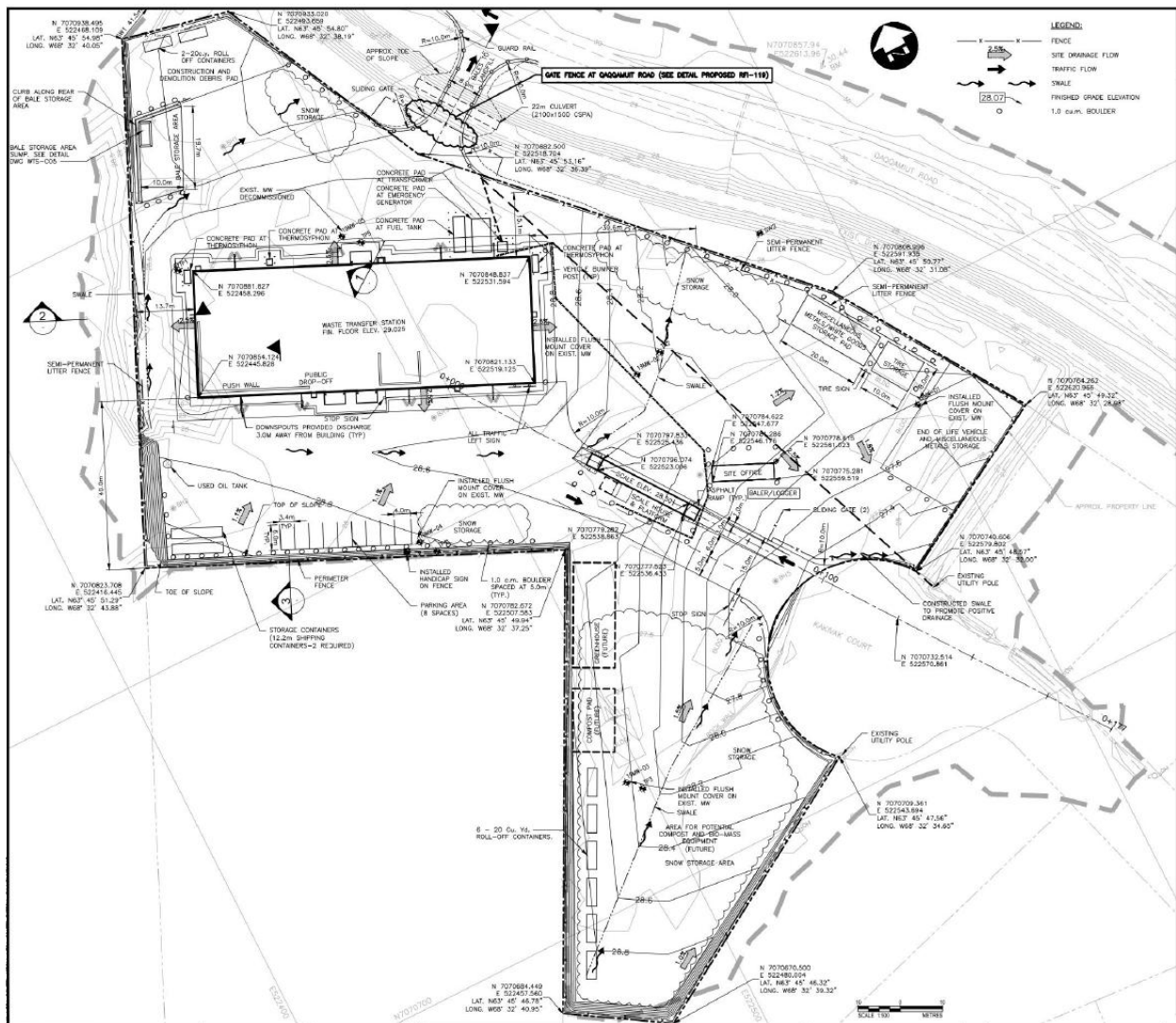


Figure 4.4 Waste Transfer Station Layout



### 4.2.3 WASTE GENERATION DURING LTWP CONSTRUCTION

Waste will be generated during the construction of the LTWP, which is expected to occur from 2026 through to 2029. The City will aim to minimize waste generation through purchasing the appropriate quantity of materials required for construction, where feasible any left-over material will be saved to be used by the City in the future.

The types, volume and forms of waste disposal during construction are presented in Table 4.1.

*Table 4.1 LTWP Construction Waste*

Type of Waste	Projected Amount	Method of Disposal
Wood recycled or reused	N/R	City landfill
Oil and grease	5,500 Liters	City landfill - Non-Haz Waste Department
Waste oil	5,500 Liters	City landfill - Non-Haz Waste Department
HDPE pipe	223 m	City landfill
Non-woven geotextile and liner	2,000 m <sup>2</sup>	City landfill
Domestic waste	1,920 yards	City landfill
Grey water	Unknown	City or contractor sanitary truck to City Wastewater Treatment Plant
Black water	Unknown	City or contractor sanitary truck to City Wastewater Treatment Plant
Overburden (organic soil, waste material)	2,000 m <sup>3</sup>	Deposed onsite

The construction of the LTWP does not involve wastewater or grey water generation. Wastewater generated during construction will be managed through portable toilet facilities and treated at the City’s existing wastewater treatment plant. Wastewater generated from the new pump stations will be held on site to be emptied by pump truck and treated at the City’s existing wastewater treatment plant.



## 5.0 SPILL CONTINGENCY PLANNING (PART H)

An updated Spill Contingency Plan, required by Part H, Item #1 of the licence, is presented as Attachment 56. A spill contingency plan specific to the temporary water withdrawals at the Apex River (the Apex River Water Withdrawal: Site Specific Spill Contingency Plan), is provided as Attachment 57.

Contractors working for the City are obligated to implement the City's Spill Contingency Plan or to have their own. Requests for proposals (RFPs) and contracts provide the water licence and state that the contractor is to adhere to all requirements. The water licence conditions are also reviewed with contractors prior to field work.



## 6.0 MONITORING (PART I)

### 6.1 SURVEILLANCE NETWORK PROGRAM (SCHEDULE I)

Table 6.1 presents the test groups and associated analytical parameters presented in Table 1 of Schedule I of the current Licence. The City is not proposing any changes to the test groups or parameters.

Table 6.1 Water Quality Parameters

Test Groups	Analytical Parameters	Units
Routine (R)	Alkalinity, Acidity, Chloride, Carbonate, Bicarbonate, Total Hardness, Hydroxide, Sulphate, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Total Organic Carbon (TOC), Total Inorganic Carbon (TIC)	mg/L
	pH (field and lab)	pH units
	Oxidation-Reduction Potential (ORP) (field)	mV
	Conductivity (field and lab)	uS/cm
	Temperature (field)	°C
	Turbidity	NTU
Effluent (E)	Total Suspended Solids (TSS)	mg/L
	Temperature (field)	°C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Acute Lethality (AL)	Based on Environment Canada's <i>Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout</i> (EPS 1/RM/50, March 2008), if single concentration test fails and un-ionized ammonia concentration is less than or equal to 1.25 mg/L.	"Pass" / "Fail"
ICP- Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	mg/L
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	mg/L
Biological (B)	Biochemical Oxygen Demand	mg/L
	Total and Fecal Coliform	CFU/100 mL
	Fecal Coliform	CFU/100 mL
Potable Water (PW)	ICP Metals (Total and dissolved)	mg/L
	Total Suspended Solids –TSS	mg/L
Flow (F)	Volume	m <sup>3</sup>
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs), Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	mg/L



Table 6.2 presents the surveillance network program (SNP) stations in the current Licence, and proposed changes to be incorporated into the new and amended licence. These changes to the stations would need to be incorporated into Table 2 in Schedule I. The City will identify new SNP stations for the LTWP prior to the start of construction.

Active SNP monitoring stations are shown on Figure 6.1.

The Environmental Monitoring and Quality Assurance / Quality (QA/QC) Control Plan, developed in accordance with Part I, Items 2 and 5, is presented as Attachment 58. A Facility Monitoring Plan for the Landfill and Waste Transfer Station was also developed as a condition of Amendment No. 5 of the licence (Attachment 59). This monitoring plan has been incorporated into the Environmental Monitoring and QA/QC Control Plan.

Sampling frequencies for surface water and groundwater are proposed to be revised to a maximum of twice per year to reflect site-specific climatic constraints. Daily or monthly sampling is not feasible during winter months when surface water bodies are frozen, and monitoring wells are inaccessible due to snow and ice accumulation more than one metre. These conditions severely limit reliable sample collection and render consistent year-round monitoring impractical.

Sampling will be conducted at each of the stations as per the Monitoring Plan and in accordance to Part I of the licence. The sampling will be completed by qualified City personnel or an experienced environmental consultant on behalf of the City. This is CADUCEON Environmental Laboratories in Ottawa.



Table 6.2 Proposed Changes to the Surveillance Network Program Monitoring Stations

Station ID	Description	Status	Proposed Change
IQA-01	Lake Geraldine Reservoir - Raw Water	Active	No change proposed.
IQA-01(#)	Based on Part I, Item 4 of Expired Licence	Inactive	Do not carry over into new licence.
IQA-02	Sewage Lagoon - Effluent Discharge Point	Active	No change proposed.
IQA-03	Sewage Lagoon – Influent	Inactive	Do not carry over into new licence.
IQA-04	Wastewater Treatment Plant - Effluent	Active	No change proposed.
IQA-05	Wastewater Treatment Plant - Influent	Active	No change proposed.
IQA-06	Sludge - From WWTP	Active	No change proposed.
IQA-07	Surface Water entering West 40 Landfill – Based on Part E, Item 4 of the Expired Licence	Inactive	Do not carry over into new licence.
IQA-08	West 40 Landfill - Effluent Discharge Point	Active	No change proposed.
IQA-08(#)	Based on E, Item 17, Part F, Item 10 & Part I, Item 4 of the Expired Licence	Inactive	Do not carry over into new licence.
IQA-08A	Station situated up-gradient of West 40 Landfill	Active	No changes proposed.
IQA-08B	Station situated down-gradient of West 40 Landfill	Active	
IQA-09	Contaminated soil accepted at the West 40 Landfill	Inactive	Do not carry over into new licence.
IQA-10	Withdrawal from Upper Niaqunngut River for transfer directly into the Reservoir	Active	No change proposed.



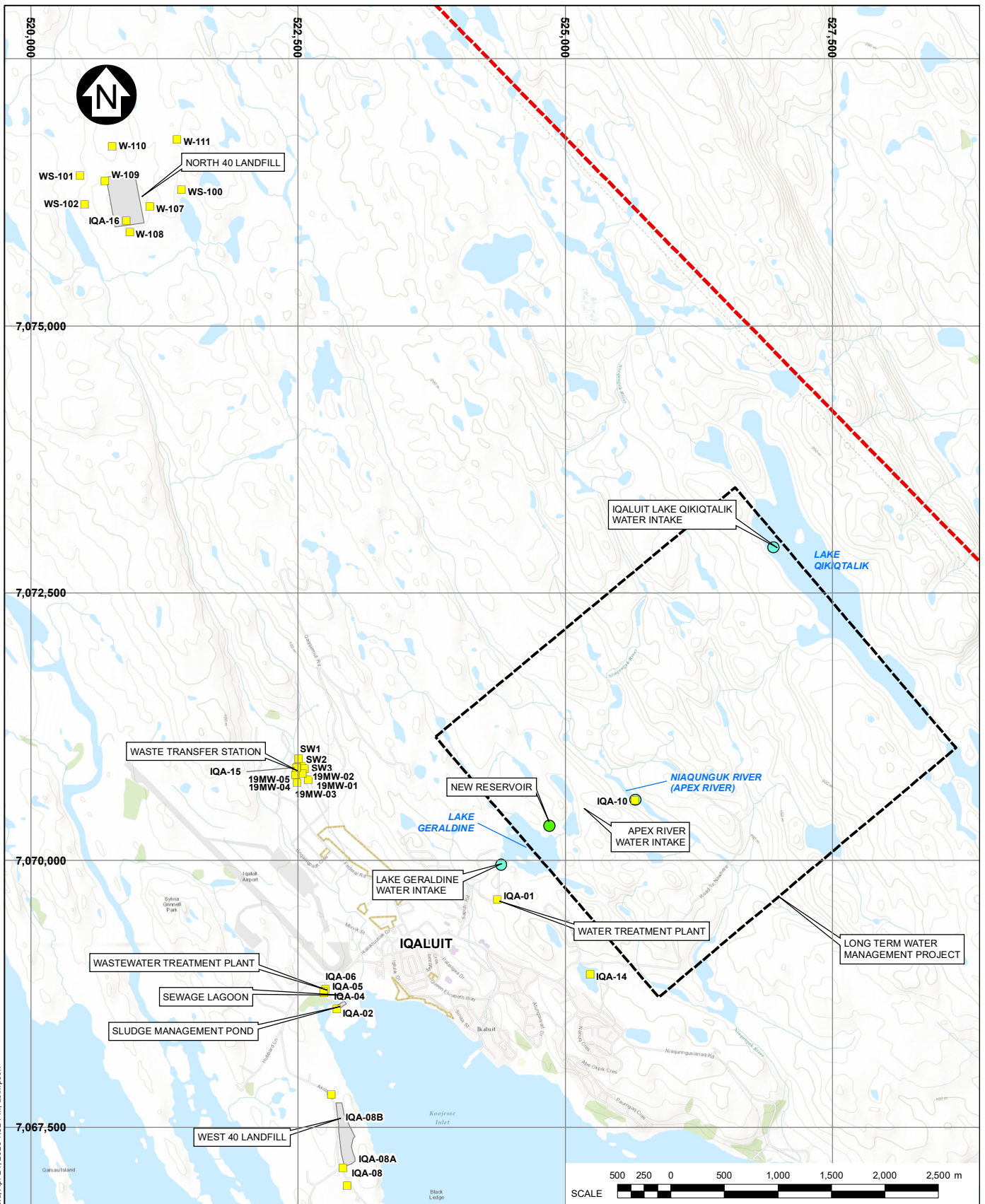
Station ID	Description	Status	Proposed Change
IQA-11	Withdrawal from Middle Niaqunngut River watershed for transfer directly into the Reservoir. Withdrawal point to be located on an ephemeral tributary near where it enters the Niaqunngut River or on the river itself just downstream of the confluence with the tributary.	Inactive	Do not carry over into new licence.
IQA-12	Withdrawal from small unnamed source water lakes adjacent to Lake Geraldine Reservoir for transfer directly to the reservoir	Inactive	Do not carry over into new licence.
IQA-13	Withdrawal from large unnamed source water lake for transfer into ephemeral tributary to Niaqunngut River. Intent of withdrawal is to provide water to withdrawal point at Monitoring Station IQA-10.	Inactive	Do not carry over into new licence.
IQA-14	Withdrawal from Imiqtarviviniq (Dead Dog Lake) for dust suppression	Active	N/A



Station ID	Description	Status	Proposed Change
IQA-15	Waste Transfer Station Runoff/Leachate Discharge Point	Active	<p>Leachate generated from baling of waste at the WTS will be collected in a holding tank that will be pumped out and brought to the WWTP for disposal. Suggest renaming this station to read, “Waste Transfer Station Leachate Holding Tank” to be more descriptive.</p> <p>Propose changing the frequency of sampling of “B, N, E, ICP, LS” parameters from daily to the collection of a representative sample once prior to or during each discharge, which better suits how the leachate is being handled and disposed of.</p> <p>Change flow (F) from daily flow measurements to during discharge (i.e., quantity of leachate emptied from the holding tank for disposal at the WWTP).</p>
IQA-16 (WS-103)	Landfill Runoff/Leachate Discharge Point	Active	<p>Leachate from the landfill will be collected in two ponds, prior to discharge (to the West 40 Landfill, the WWTP, or (subject to the NWB’s approval), locally to a gravel bed diffuser. Suggest renaming this station to read, “Landfill Leachate Collection Pond Discharge”.</p> <p>Change frequency of sampling of “B, N, E, ICP, LS” parameters from “once prior to discharge, once during discharge; and once prior to the completion of discharge” to “twice annually”, for collection in the spring and fall. This will better characterize the leachate quality following spring melt and again before freeze-up.</p> <p>Change flow (F) from daily flow measurements to during discharge (i.e., quantity of leachate discharged to the environment).</p>
IQA-17	Withdrawal from Sylvia Grinnel River	Inactive	Do not carry over into new licence.
SW1 to SW3	Waste Transfer Station surface water monitoring	Active	Frequency of sampling of field parameters from monthly to twice a year to align with laboratory testing.



Station ID	Description	Status	Proposed Change
WS-100 to WS-102	New North Landfill surface water monitoring	Active	Frequency of sampling of field parameters from monthly to twice a year to align with laboratory testing. Rename station, “North 40 Landfill surface water monitoring.”
19MW-01 to 19MW-05	Waste Transfer Station ground water monitoring	Active	Frequency of sampling of field parameters from monthly to twice a year to align with laboratory testing.
W-107 to W-111	New North Landfill ground water monitoring	Active	Frequency of sampling of field parameters from monthly to twice a year to align with laboratory testing. Rename station, “North 40 Landfill surface water monitoring.”



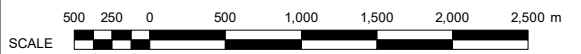
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**LEGEND:**

- NEW RESERVOIR
- SNP LOCATION (ACTIVE)
- WATER INTAKE
- MUNICIPAL LIMITS
- FACILITY
- LONG TERM WATER MANAGEMENT PROJECT

**NOTES:**

1. COORDINATE GRID IS IN METRES.  
COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N.
2. BASE MAP/IMAGERY: © ESRI AND DATA (ONLINE) SERVICE LAYERS (2025).  
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**CITY OF IQALUIT**  
**TYPE A WATER LICENCE**  
**SURVEILLANCE NETWORK PROGRAM**  
**MONITORING STATIONS**

	PIA NO. NB102-537/1	REF NO. 1
	FIGURE 6.1	

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
1	24APR'26	ISSUED WITH REPORT	JWG	AS	RAC



## 7.0 CLOSURE AND RECLAMATION (PART J)

Part J of the current Licence approved the Iqaluit Solid Waste Management Plan West 40 Landfill Decommissioning Technical Memorandum (AECOM, 2014), presented as Attachment 14.

The City will continue to use the West 40 Landfill for several more years until the capacity is reached. A Final Closure and Reclamation Plan will be submitted to the Board for approval at least one year prior to commencing the decommissioning of the West 40 Landfill in accordance to Part J, Item 2 of the current licence.

A closure and decommissioning plan for the North 40 Landfill and Waste Transfer Station is presented as Attachment 19. The 2020 version of this plan was approved by the Board under Part F, Item 10 of Amendment No. 5, which also required the Licensee to submit an updated plan that addressed interveners' comments and recommendations. The version presented as Attachment 19 is dated August 2022 (Dillon, 2022).



## 8.0 MANAGEMENT PLANS

### 8.1 EXISTING PLANS AND MANUALS

Table 8.1 identifies the existing plans and O&M manuals required under the current Licence.

*Table 8.1 Status of Management Plans Required Under the Type A Water Licence*

Water Licence Requirement	Plan	Current Version	File Location
Part E, Item 6	Sewage Lagoon O&M Manual	Rev 8, April 2026	Attachment 45
Part E, Item 7	Wastewater Treatment Plant O&M Manual	Rev 3, April 2020	Attachment 43
Part E, Item 9	Solid Waste Management Plan	EXP Services, 2014	Attachment 46
Part E, Items 12 and 20; Part F, Items 12 and 13	West 40 Landfill O&M Manual	AECOM, 2024	Attachment 47
	North 40 Landfill and Waste Transfer Station O&M Manual	Dillon, 2022	Attachment 51
Part E, Item 23	Leachate Characterization and Management Plan	Rev 2, Dillon, 2023	Attachment 52
Part F, Item 9	Apex River Water Withdrawal: Erosion and Sedimentation Control Plan	Nunami Stantec, 2018a	Attachment 57
Part F, Item 9	City of Iqaluit Environmental Protection Plan Construction Phase, Landfill and Waste Transfer Station	Dillon, 2020	Attachment 55
Part F, Item 10	Environmental Management Plan - Landfill and Waste Transfer Station	Dillon, 2022	Attachment 54
Part F, Item 15	Facility Monitoring Plan - Landfill and Waste Transfer Station	Dillon, 2022	Attachment 59
Part H, Item 1	Spill Contingency Plan	Rev 1, March 2026	Attachment 56
	Apex River Water Withdrawal: Site Specific Spill Contingency Plan	Nunami Stantec, 2018b	Attachment 57
Part I, Item 2 & Part I, Item 5	Environmental Monitoring and Quality Assurance/Quality Control Plan	Rev 4, April 2026	Attachment 58
Part J, Item 5	West 40 Landfill Final Closure and Reclamation Plan	AECOM, 2014	Attachment 48



The date of the current version and its location within this Application is indicated in the table. The following plans/manuals were recently updated and have not yet been approved by the Board:

- Sewage Lagoon O&M Manual
- West 40 Landfill O&M Manual (2024 version)
- Spill Contingency Plan
- Environmental Monitoring and QA/QC Plan

Part D, Item 12 in Amendment No. 4 of the water licence added the following requirement:

*The Licensee shall, prior to the expiry of this Licence in 2026, submit to the Board a contingency plan in either a standalone document or as an addendum to a current plan that includes the options for action if the Niaqunguk River (Apex River) is found to have insufficient water volumes to fully supplement the Lake Geraldine Reservoir.*

The LTWP (Section 3.3) presents the City's plans for to provide sufficient water through until 2050, and thus this is considered to meet the requirement in Part D, Item 12 of the current licence.

## **8.2 SCHEDULE FOR FUTURE PLAN UPDATES**

Management plans and manuals associated with the new North 40 Landfill and Waste Transfer Station have not been updated since 2022, as the facilities have been constructed but have not yet been commissioned. These plans will be updated once the facilities have been commissioned and some operating experience has been gained that warrant the plans to be updated.

Once the LTWP has been approved, it may be necessary to update the Spill Contingency Plan and establish a site-specific erosion and sediment control plan prior to construction. It will be necessary to develop an O&M manual for the LTWP components, once the facilities are operational.

Part J, Item 5 of the current licence requires a final closure design report to be submitted to the Board at least one year prior to commencing decommissioning of the West 40 Landfill. The West 40 Landfill will be used for up to three more years, so this clause should be carried into the new licence.

Finally, each of the plans may require additional updates to reflect the requirements of the future renewed and amended licence.



## 9.0 REFERENCES

- AMEC Environment & Infrastructure, 2011. *Lake Geraldine Dam Dam-Breach Analysis and Inundation Mapping Study*. Ref. No. WE1033, May.
- Arcadis Canada Inc. (Arcadis), 2025a. *Physical, Biological and Socioeconomic Screening Report - Long Term Water Project – Supply and Storage*. Ref. No. 30192375. Prepared for the City of Iqaluit. September.
- Arcadis Canada Inc. (Arcadis), 2025b. *City of Iqaluit - Preliminary Design Report - Long Term Water Program – Supply and Storage – Draft Report*. Ref. No. 30192375. Prepared for the City of Iqaluit. September.
- Concentric Associates International Inc. (Concentric), 2023. Letter Report Re: *City of Iqaluit Lake Geraldine Dam Intake Vault Options Analysis – Final Report*. Ref. No. 22-9638, August 28.
- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), 2026. Letter, Re: *Water Licence No: 3AM-IQA1626 Type A, City of Iqaluit; Renewal and Amendment Application by the City of Iqaluit - Completeness Assessment*.
- Dillon Consulting, 2020. *City of Iqaluit - Environmental Protection Plan - Operations, Closure and Post-Closure Phases - Landfill and Waste Transfer Station*. Ref. No. 19-9543, October.
- Dillon Consulting, 2020. *City of Iqaluit - Environmental Protection Plan – Construction Phase - Landfill and Waste Transfer Station*. Ref. No. 19-9543, December.
- Dillon Consulting, 2022. *City of Iqaluit - Environmental Management Plan - Landfill and Waste Transfer Station*. Ref. No. 19-9543. August.
- Dillon Consulting, 2022. *City of Iqaluit – Closure and Decommissioning Plan - Landfill and Waste Transfer Station*. Ref. No. 19-9543, August.
- Dillon Consulting, 2023. *Leachate Collection and Characterization Plan*. Ref. No. 19-9543, Rev 2, February 2.
- EXP Services Inc., 2020. *Iqaluit Water Storage Pre-Feasibility Study*.
- Fisheries and Oceans Canada (DFO), 1995. *Freshwater Intake End-of-Pipe Fish Screen Guideline*. ISBN 0-662-36334-5, Catalogue No. Fs 23-270 / 2004E-PDF. March 1995.
- Fisheries and Oceans Canada (DFO), 2024. Letter to the City of Iqaluit, *Subject: Apex River Water Withdrawal – Request for Water Withdrawal to Exceed 10% of Instantaneous Discharge – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat*. DFO File No. 23-HCAA-02636, March 25.
- Fisheries and Oceans Canada (DFO), 2026. Letter, *Subject: Water Licence, Type A, City of Iqaluit; Renewal and Amendment Application*. Your File No. 3AM-IQA1626. February 6.
- Golder Associates Ltd., 2013. *Lake Geraldine Water Balance Assessment*.



Government of Canada. 2025. Economic Profile: Iqaluit, Nunavut. Available at: <https://www.canada.ca/en/immigration-refugees-citizenship/campaigns/immigration-matters/local-economies/iqaluit.html>. Last accessed December 10, 2025.

Nunami Stantec, 2018a. *Apex River Water Withdrawal: Erosion and Sedimentation Control Plan*. December 21.

Nunami Stantec, 2018b. *Apex River Water Withdrawal: Site Specific Spill Contingency Plan*. December 21.

Nunavut Impact Review Board (NIRB), 2026. *Screening Decision Report – NIRB File No. 25XN041*. March 19.

Nunavut Planning Commission, 2025. *NPC File No. 150798 Long Term Water Project*. April 25.

Nunavut Planning Commission, 2026. *NPC File No. 151186 Short Term Water Licence Renewal*. April 21.

Nunavut Water Board (NWB), 2016. *Nunavut Water Board Type “A” Water Licence No: 3AM-IQA1626*. June 16.

Nunavut Water Board (NWB), 2022. *Nunavut Water Board Type “A” Water Licence No: 3AM-IQA1626 - Emergency Amendment Decision and Licence Amendment No. 7*. August 22.

Nunavut Water Board (NWB), 2026. Letter: *Water Licence No: 3AM-IQA1626 Type A, City of Iqaluit; Renewal and Amendment Application by the City of Iqaluit*. January 8.

Tetra Tech Canada Inc., 2025a. *Qikiqtaalik Lake Water Balance for Withdrawals – Final Report*. Presented to the City of Iqaluit. File No. 704-ENG.WTRI03087-01, July 24.

Tetra Tech Canada Inc., 2025b. *Desktop Study of Discharge in Apex River*. Presented to the City of Iqaluit. File No. 704-ENG.WTRI03087-01, July 24.

WSP, 2024. *Long-Term Water Project Owner’s Engineer – Lake Geraldine Intake Valve Chapter Final Report*. Ref. No. CA0023312.3294, April 29.