

ATTACHMENT 22

LTWP Preliminary Design Report – Appendix M – Environmental Management Plan

City of Iqaluit

Environmental Management Plan

Long-Term Water Project – Supply and Storage

Iqaluit, Nunavut

September 2024



City of Iqaluit Long-Term Water Project

Environmental Management Plan

September 2024

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Acronyms and Abbreviations

CAO	Cheif Administrative Officer
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
City	The City of Iqaluit
CLP	Canada Labour Program
DFO	Department of Fisheries and Oceans
DOH	Department of Health
ECCC	Environment and Climate Change Canada
ECTRIM	Environmental Compliance Tracking and Reporting Matrix
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
GN	Government of Nunavut
GN-CGS	Government of Nunavut Department of Community and Government Services
GN-DOEd	Government of Nunavut Department of Education
GN-DOE	Government of Nunavut Department of Environment
GN-CH	Government of Nunavut Department of Culture and Heritage
ID	Identifier
LTWP	Long-Term Water Project
NCR	Non-Conformance Report
NIRB	Nunavut Impact Review Board
NPC	Nunavut Planning Commission
NRCan	Natural Resources Canada
NRI	Nunavut Research Institute
NU	Nunavut

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PDCA	Plan Do Check Act
PLAA	Permits, Licenses, Approvals and Agreements
PSC	Public Safety Canada
RWPS	Raw Water Pumping Station
SVEC	Socio-economic Valued Environmental Component
TC	Transport Canada
VEC	Valued Environmental Component
WSCC	Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut

1 Introduction

Arcadis Canada Inc. (Arcadis) was retained by the City of Iqaluit (the City) to prepare the Environmental Management Plan (EMP) for the planned Long-Term Water Program - Raw Water Supply and Storage Project (LTWP) in Iqaluit, Nunavut (NU). The objective of this EMP is to identify, plan for, and manage environmental compliance for the LTWP. The EMP has been prepared following the requirements outlined in the LTWP Request for Proposal 2023-RFP-048. This document is designed to be a living document that will be updated as the LTWP advances.

1.1 Project Description

The LTWP consists of developing a permanent water conveyance system from Lake Qikiqtaalik to the Lake Geraldine Reservoir, as well as an expansion of the capacity of a New Reservoir, and other associated structural requirements (Figure 1.1). The primary objectives of the LTWP are to:

- Establish a new long-term water source and the necessary infrastructure to address the City's present and future water demands, ensuring that the water supply system supports economic growth; and,
- Construct a new reservoir to secure sufficient year-round water storage capacity by adding a minimum 1.5 fold increase in the over-winter storage capacity and meeting the current and projected needs of the City.

The main LTWP components include:

- Intake at Lake Qikiqtaalik.
- Raw Water Pumping Station (RWPS) at Lake Qikiqtaalik.
- New water conveyance pipeline.
- Upgrading as required of the existing road and culverts located between Lake Qikiqtaalik and the Road to Nowhere.
- Pipeline crossing of the Apex River.
- New access road from the Road to Nowhere to the New Reservoir requiring the dewatering and filling of three existing ponds.
- Laydown areas near the RWPS and shooting range.
- Concrete plant at the RWPS.
- Eight retention structures creating the New Reservoir.
- One spillway to the Apex River.
- Valve access building at the New Reservoir.
- Buried conveyance pipeline between the New Reservoir and Lake Geraldine.
- Quarries for rock at the New Reservoir and the construction laydown area.

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- Borrows for sand materials.
- Electrical distribution line to the RWPS at Lake Qikiqtaalik and the control building at the New Reservoir, and
- Backup power generation is needed at these locations to maintain the thermal protection pipes in winter.

See Figure 1-1 for details.

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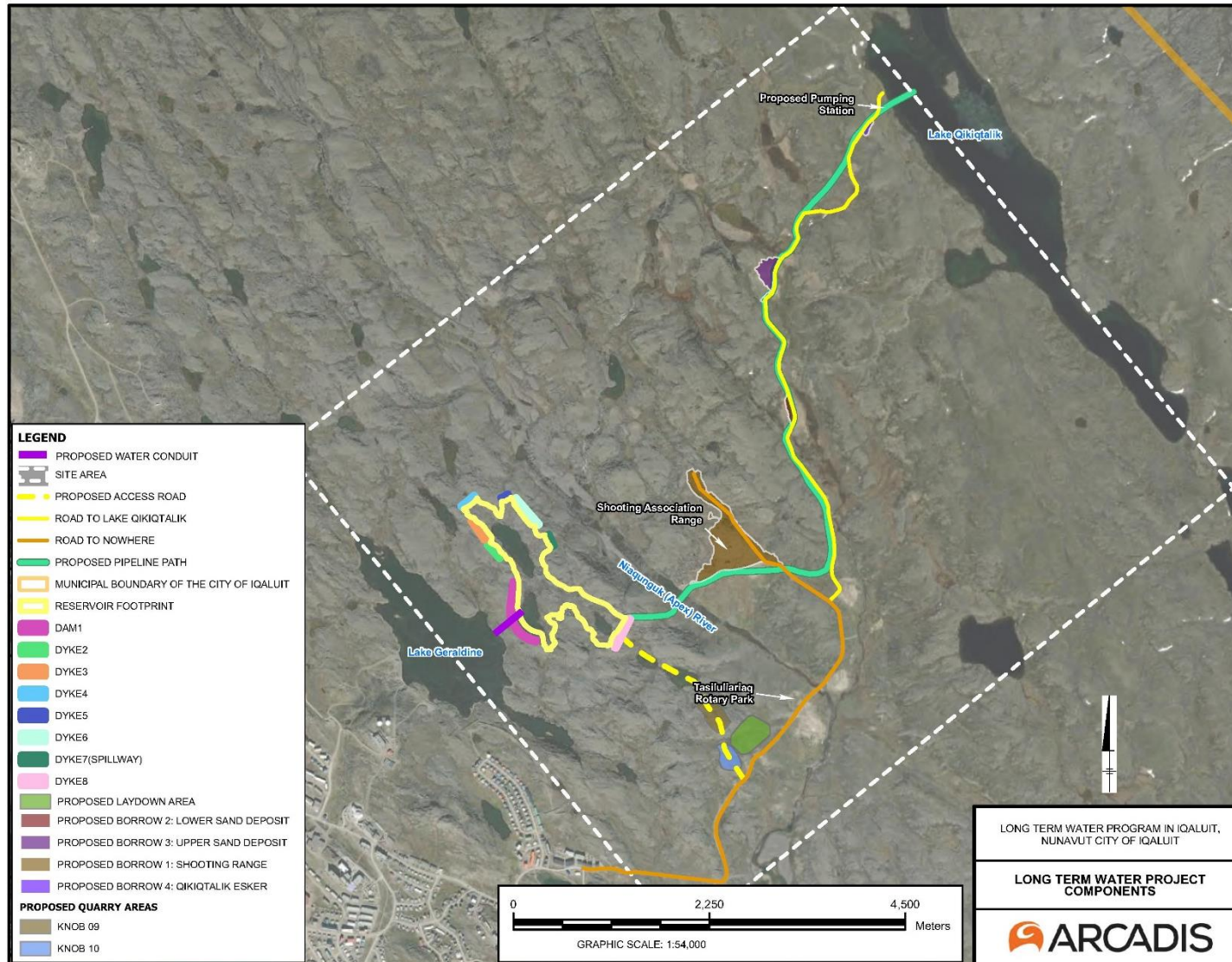


Figure 1-1 Site Plan

1.2 Purpose

The City has developed this Environmental Management Plan (EMP) to meet the Project's environmental compliance obligations through the development, construction, operation and decommissioning of the LTWP. The EMP will be implemented, maintained, and continuously improved in accordance with ISO 14001 and associated documents throughout the design, construction, and operational phases. The EMP will follow the “Plan, Do, Check, Act” (PDCA) framework (see Figure 1-2).



Figure 1-2 PDCA Framework

1.3 Objectives of the EMP

The objectives of this EMP are to identify, plan for, and manage environmental compliance for the LTWP. It is the City's goal that environmental permitting and regulatory obligations are identified so that they are respected, do not impede with schedule or cost during the construction and operations phases of the LTWP, and ensure environmental protection. The City commits to ongoing improvement to the LTWP's environmental performance, and that a strong framework is established for communicating environmental requirements to all personnel at all Project phases.

1.4 Applicability and Scope

The scope of this EMP applies to all activities undertaken by the City and its subcontractors during the design, construction, and operational phases of the Project. The EMP will be relevant and applicable to all Project personnel and associates participating in Project Works.

This EMP describes all the environmental obligations, requirements, standards, and procedures to be followed by Project personnel, including contractors and subcontractors, during the design, construction, and operational phases. The EMP is a “living document” and will be reviewed and updated at various stages of the Project (as required) to include the most current Project information and activities. The focus of the EMP in the design phase is to develop appropriate sub-plans to fulfil design requirements and to incorporate these into the required permit applications. These sub-plans will be revisited on an ongoing basis and adjusted as necessary to address the specific conditions encountered during the construction phase.

This EMP includes the following key components:

- Environmental Policy.
- Leadership and commitment.
- Roles and responsibilities.
- Environmental aspects and impacts.
- Regulatory and legal and other environmental requirements.
- Maintenance of records and documentation.
- Environmental monitoring and measurement.
- Incident reporting.
- Management review of the EMP, and
- Change management.

1.5 Project Reference Documents

Below are a series of table summaries of the associated documentation that is currently available for the LTWP and were used to prepare the EMP. These tables will be used to track the documents which have been included in the EMP.

Table 1 Contractual Documents for LTWP

ID	Agency	Reference Code	Date	Title
[1]	City of Iqaluit	2023-RFP-048	2023-04-12	RFP for the Provision of Owner’s Engineer for the Long-Term Water Program – Raw Water Supply and Storage

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Table 2 Project Documents for LTWP

ID	Agency	Reference Code	Date	Title
[2]	Arcadis	30192375-CDR	2023-11	Conceptual Design Report – Long-Term Water Program
[3]	Arcadis	30192375-PBSEIA	2023-11-29	DRAFT Physical Biological Socioeconomic Impact Assessment Report – Long-Term Water Program
[4]	Arcadis	30192375-SPCP	2024-01-16	Stakeholder and Permitting Communication Plan
[5]	Explotech	none	2023-12-15	Long-Term Water Program – Raw Water Supply and Storage Project Blasting Assessment Memo, Iqaluit, Nunavut
[6]	Arcadis	30192375-PDR	2024-03	Preliminary Design Report – Long-Term Water Program – Supply and Storage

Table 3 Permit Documents for LTWP

ID	Agency	Reference Code	Date	Title
[7]	NIRB	23YN040	2023-11-02	NIRB Screening Decision Report (application no. 125845) - Geotechnical Investigations
[8]	NPC	1550099	2023-06-23	Conformity Determination - Long-Term Water Project - Geotechnical Investigation
[9]	Government of Nunavut Department of Culture and Heritage	2023-52A	2023-07-14	Class 2 Nunavut Territory Archaeologist Permit: Archaeological Impact Assessment City of Iqaluit: Long-Term Water Project
[10]	DFO	24-HCAA-00575	2024-05-23	Geotechnical Drilling, Niaqunguk (Apex) River, Iqaluit (24-HCAA-00575) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Table 4 Standards and Best Practice Documents

ID	Agency	Reference Code	Date	Title
[11]	NIRB	Proponents' Guide	2020-02	Proponent's Guide – NIRB Technical Guide Series
[12]	DFO	Canadian Technical Report of Fisheries and Aquatic Sciences 2107	1998	Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters

Table 5 Description of Change from Previous Versions

Description of change	Section(s) where modifications occur
None	None

2 Environmental Policy and Leadership

2.1 Environmental Policy

An Environmental Policy guides the approach to environmental management and stewardship and aligns with relevant regulatory obligations. All employees, subcontractors, and suppliers working on behalf of the City are required to comply with the Environmental Policy. The Environmental Policy supports the communication of the City's environmental expectations. An Environmental Policy has not been developed by the City, however some general commitments that can be made to the LTWP are presented in Table 6 below.

Table 6 *City of Iqaluit’s Environmental Commitment*

City of Iqaluit’s Environmental Commitment
The City of Iqaluit is committed to creating a distinctive and vibrant capital that represents the unique cultural heritage of Nunavummiut. We aim to ensure that Iqalungmiut live in a safe, caring, prosperous, and attractive city that reflects an Arctic lifestyle. These objectives include: • Creating a distinctive core area and capital district that harmonizes with the surrounding natural arctic landscape. • Reflecting and celebrating Inuit cultural heritage. • Recognizing and protecting the Arctic way of life. • Providing a clear development strategy for housing choice. • Promoting attractive and well-designed developments. • Ensuring economic opportunities. • Ensuring security and safety through design. • Protecting access to the land and sea. • Promoting participation in planning. • Ensuring implementation of the plan. • Studying the impacts of climate change. • Adopting policies that recognize and respond to the long-term impacts of climate change. By implementing this policy, the City of Iqaluit is dedicated to creating an environmentally responsible and sustainable city that preserves, protects, and enhances a clean and healthy natural environment. We strive to actively involve the Iqalungmiut in the development of their city, ensuring their voices are heard and their needs are met.

To successfully implement the Environmental Policy, the City will adhere to the following commitments for the implementation of the LTWP:

- Strive to continuously improve the way construction activities are performed while minimizing the impacts on the environment and ensuring compliance with permitting requirements issued by regulatory agencies, environmental laws, and regulations.

- Effectively manage the use of hazardous materials and products and ensure that effective measures are in place to protect human health and the environment when such materials must be used, stored, and disposed of.
- Develop and maintain appropriate emergency and spill response programs.
- Promote reduction, reuse, and recycling in all of the City's activities.
- Promote efficient use of materials and resources throughout the City's construction job sites including water, electricity, raw materials, and other resources.
- Commit to restoration and rehabilitation of all temporary construction areas.
- Protect wetlands, streams, rivers, lakes, coastal waters, groundwater, sewers, trees, vegetation, steep slopes, and highly erodible soils, and
- Integrate the consideration of environmental concerns and impacts into decision-making and activities.

Periodic reviews and internal audits will be part of the approach to continuously improve the City's environmental performance.

2.2 Leadership and Commitment

The City's senior management provides leadership and commitment to the Project by providing direct involvement, support, and direction in the following interactions:

- Management reviews.
- Periodic environmental status meetings.
- Review of compliance tracking updates.
- Review of corrective action plans, and
- Support topic-specific environmental plans to manage significant environmental aspects.

The responsibilities of senior management as specified in 5.1 of the ISO 14001:2015 standard have been incorporated into the Management Review process for this EMP. This inclusion provides periodic review and confirmation of the accountability of top management.

2.3 Roles and Responsibilities

The implementation of a concise definition and hierarchy of roles and responsibilities is necessary for the successful compliance with all environmental requirements for the LTWP. See the reporting hierarchy below in Figure 1-3. It should be mentioned that the hierarchy can be expanded, however the structure was simplified to outline the Project stakeholders relevant to this EMP.

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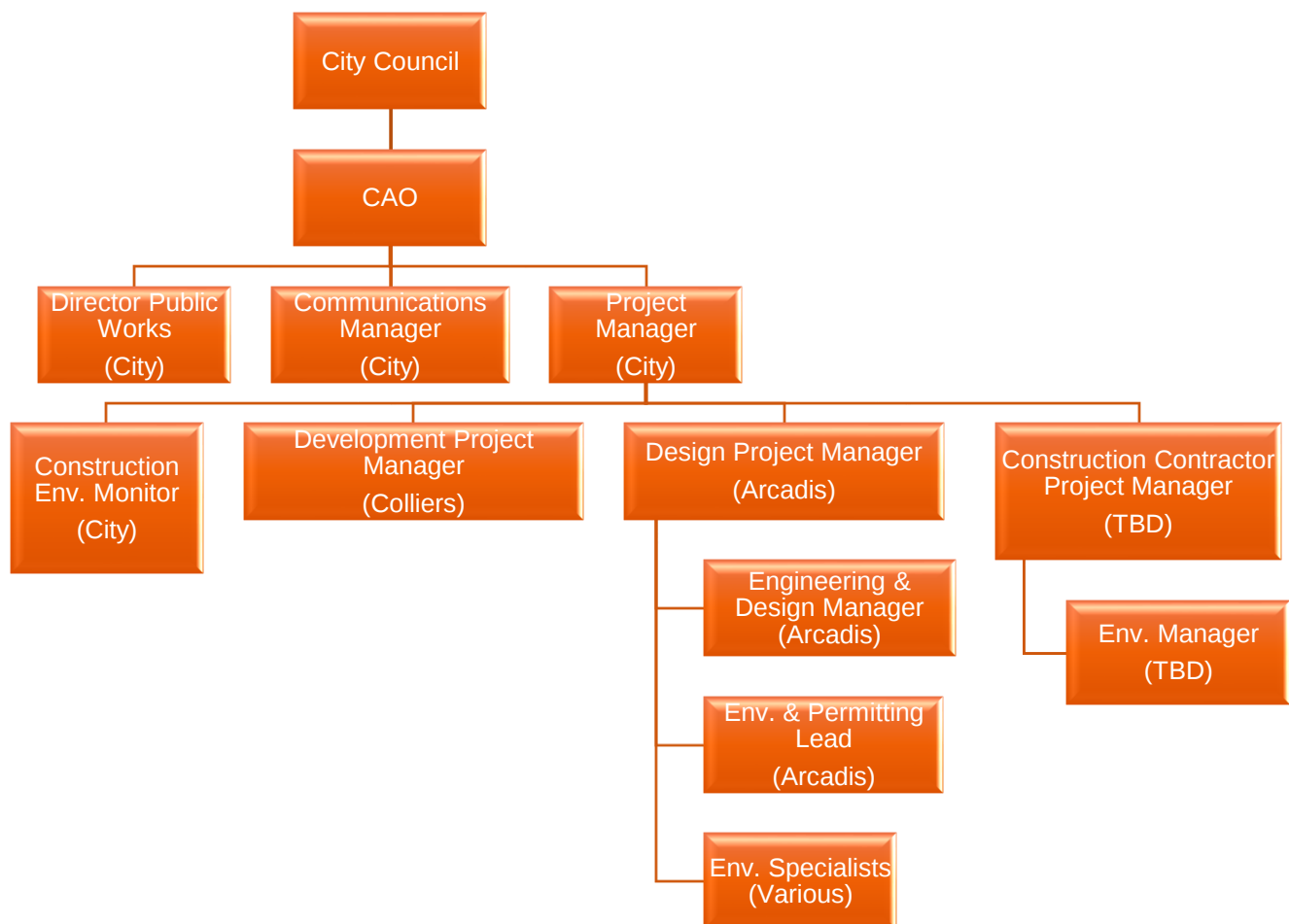


Figure 1-3 Hierarchy of Communication for LTWP

Details of the roles and responsibilities is shown below in Table 7.

Table 7 Roles and Responsibilities	
Individual or Group	Responsibilities and Authorities
City Council	Responsible for the development, construction, and operation of the LTWP.
Chief Administrative Officer (CAO)	- Implements strategic plan policies set out by the City Council. - Manages programs and services delivered by City departments. - Approves information to be released to stakeholders.
Director of Public Works	Responsible for maintenance of the water treatment plant and potable water supply.
City Project Manager	- Provides support in the LTWP design. - Leads management of the LTWP development, construction, and operation activities. - Responsible for the environmental conformance of the LTWP.
City Communications Manager	- Manages the public communications strategy and planning. - Harmonizes the communications messaging for the LTWP. - Maintains the LTWP website. - Coordinates information requests with all media.
Environmental Monitor (EM)	- During the construction phase of the Project, provide environmental monitoring of the construction activities. - Report any spills or environmental nonconformances to the City Project Manager.
Project Consultants	
Development Project Manager (Colliers)	- Supports the City in their project management activities. - Overall management and coordination of the Project. - Ensuring compliance with federal legislation and regulations. - Communication with stakeholders and regulatory agencies. - Budget management and resource allocation. - Risk assessment and mitigation. - Reporting on Project progress.
Design Project Manager (Arcadis)	- Overall management and coordination of the environmental considerations for the Project. - Ensuring compliance with all regulatory controls. - Communicating environmental requirements to the engineering team and to project management to ensure seamless design progress. - Manages the Arcadis design team and delivery of the LTWP design. - Manages the Arcadis environment team and delivery of the LTWP permitting requirements. - Supports the City in their project management activities.

Table 7 Roles and Responsibilities	
Environmental and Permitting Lead (Arcadis)	• Coordinates the environmental and permitting activities for Arcadis. • Conducting environmental assessments and impact studies. • Developing and implementing the EMP. • Ensuring compliance with environmental laws and regulations. • Monitoring and reporting on environmental performance. • Recommending mitigation measures to minimize environmental impacts.
Engineering and Design Manager (Arcadis)	• Designing and engineering the raw water pumping station and water conveyance system. • Ensuring compliance with engineering standards and regulations. • Conducting feasibility studies and technical assessments. • Overseeing construction and installation activities. • Collaborating with the environmental team to incorporate environmental considerations into the design.
Construction Contractor Project Manager (TBD)	• Constructing the raw water pumping station and water conveyance system. • Adhering to construction plans and specifications. • Implementing safety measures and protocols. • Managing construction schedule and resources. • Coordinating with the project manager and engineering team for smooth Project execution.
Construction Contractor Environmental Manager (TBD)	• Responsible for ensuring that environmental obligations are respected. • Observe and report any non-conformities. • Track permitting obligations. • Provide support to the Construction Contractor Project Manager.
Environmental Specialists (Various)	• Discipline leads advising Project team and leadership as subject matter experts (specialists). This may include: ○ Air Quality Specialists. ○ Ecologists/ Biologists. ○ Species At Risk Biologists. ○ Climate Mitigation and Resilience Specialists. ○ Inuit Heritage Specialists. ○ Noise Specialist. ○ Archaeologist. ○ Soil and Groundwater Contamination/ Environmental Site Assessor.

2.3.1 Competence and Awareness

The City will provide information to its team members including contractors and subcontractors, to ensure awareness and understanding of the potential environmental effects of the LTWP, and the approaches to environmental protection contained in the EMP and the environmental management plans. Worker Orientation will be provided to ensure all personnel who are doing work under the City's control are aware of:

- The environmental commitments.
- The significant environmental aspects and related actual or potential environmental impacts associated with their work.
- Their contribution to the effectiveness of the environmental management system, including the benefits of enhanced environmental performance.
- The implications of not conforming with the environmental management system requirements, including not fulfilling the organization's compliance obligations.

The City will ensure that team members including contractors and subcontractors, who have specific responsibilities under the EMP are competent to perform their responsibilities. This may be done through specific training, education, work experience, certifications or other credentials as required.

Documentation will be retained by worker supervision or the contractor manager as evidence of competence.

2.3.2 Communication

The City is committed to environmental communications at the relevant functions and levels of the LTWP. The procedure is applied to all operations to the degree that is necessary to facilitate consistency and where possible is integrated into the operations of the LTWP.

2.3.2.1 Internal Communications

Internal communications regarding the organization's EMP, opportunities to contribute to continual improvement, and changes to the EMP are made on an as-needed and flexible schedule. These communications may be made using any of the regular communication methods listed below.

- E-mail.
- Telephone calls and voice mail.
- Management reviews, and

- In person and virtual meetings.

2.3.2.2 External Communications

External communications are managed by the City's Communications Manager. The processes to complete and record these communications are documented in the plans associated with each requirement.

General inquiries and community complaints related to environmental issues are referred to the City Communications Manager to evaluate and determine the appropriate response. An environmental communications log is maintained by environmental staff to record the details of the environmental inquiries, complaints and responses.

Emergency communications related to spills or other environmental emergencies follow processes within ERP and recorded within incident reports. Internal communications related to emergency response and escalation notices are described in site emergency response plans.

2.3.3 Documented Information

The City is committed to the submission of documentation that is legible, dated (with dates of revision) and readily identifiable; that is maintained in an orderly manner; and retained for a specified period. The City will maintain an online project site accessible by all team members. Project documentation, submissions, schedules, etc. are tracked and maintained directly on the site. The system maintains an audit trail of when and by whom records have been created, retrieved, or altered while allowing the most current version to be used to facilitate document and records storage and control.

- Environmental records are maintained and controlled as objective evidence of conformance to the requirements of this plan, ISO 14001 and contractual requirements. EMP documentation control includes the following principles:
- Documents will be reviewed, revised as necessary and approved for adequacy by authorized personnel.
- The current version of relevant documents will be available where operations essential to the effective functioning of the EMP are performed.
- Documents of external origin determined by the organization to be necessary for the planning and operation of the EMP are identified and their distribution controlled.
- Obsolete documents will be promptly removed from all points of issue and use, or are otherwise assured against unintended use, and
- Any obsolete documents retained for legal and / or knowledge preservation purposes will be suitably identified.

3 Planning

3.1 Environmental Aspects

The environmental aspects of the LTWP include components that may be impacted by the Project activities, such as impacts on the physical, biological, and socio-economic environments. The mitigation of potential impacts is achieved by first anticipating and identifying the environmental interactions and documenting them. The Environmental Aspects Interactions Matrix (Matrix) presented in Appendix A, considers the known LTWP activities that will interact with the environment and may have potential environmental impacts during the planning, construction, and operation phases of the LTWP. . The environmental aspects were then evaluated to determine the overall significance. An environmental aspects list and worksheet have been developed to document the determination of significant aspects, risks and opportunities related to each aspect, and controls to mitigate potential impacts.

The associated mitigation measures are incorporated in the design development and identified in the Environmental Protection Plan (EPP), which are to be applied during construction to avoid or minimize adverse effects. As the LTWP progresses, new activities or modified activities that have the potential to impact the environment will be added, and modified, as applicable. Any new environmental aspects associated with the updated activities will be identified and added to the Matrix, along with the appropriate mitigation measures. As such, the Matrix will be continuously updated to ensure that it is effective in minimizing the environmental impact of the LTWP.

The City and its design consultants will regularly communicate the key environmental aspects and potential impacts to the design and construction teams to proactively manage environmental protection and compliance of the Project with environmental obligations and requirements.

3.2 Regulators

The regulatory agencies consulted as part of the LTWP include:

- Nunavut Planning Commission (NPC).
- Nunavut Impact Review Board (NIRB).
- Nunavut Water Board (NWB).
- Fisheries and Oceans Canada (DFO).
- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC).
- Government of Nunavut Archaeology Department.
- Government of Nunavut Department of Environment.

- Government of Nunavut Department of Health, and
- The City of Iqaluit.

The agencies and regulators associated with this Project have been involved since its inception and throughout consultation, permitting, and design. The Engineering Design Team and Environmental and Permitting Lead will identify any additional contacts and stay updated concerning any discussions that might impact the LTWP design, including mitigation and monitoring measures.

3.3 Environmental Compliance Obligations

The City is committed to undertaking the LTWP in compliance with legislative requirements. This section identifies the legislative and regulatory requirements that apply to the LTWP. To document the environmental obligations applicable to the City and how these expectations will be achieved, a form will be maintained under this EMP to augment methods to implement the requirements and to document evidence or records. Details are provided in Sec. 3.5 and Updates to this form will be periodically included in the monthly environmental reports.

The list of key environmental legislation, regulations, and municipal By-laws for the Project are included in Table 8.

Table 8 Environmental Legislation, Regulations, and Municipal By-laws

Agency / Entity	Legislation, Regulations and Municipal By-laws
	Federal
Environment and Climate Change Canada (ECCC)	<i>Canadian Wildlife Act, R.S.C. 1985, c. W-9.</i>
	- Wildlife Area Regulations C.R.C., c. 1609.
	<i>Canadian Environmental Protection Act, S.C. 1999, c.33.</i>
	- Environmental Emergency Regulations, 2019 (SOR/2019-51).
	- Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations, SOR/2008-197.
	- Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations, SOR/2021-25
	- Environmental Emergency Regulations, 2019, SOR/2019-51
	<i>Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22)</i>
	- Migratory Birds Regulations, 2022 (SOR/2022-105)
	<i>Species at Risk Act (S.C. 2002, c. 29)</i>
Canada Labour Program (CLP)	<i>Canada Labour Code (R.S.C., 1985, c. L-2)</i>
Crown-Indigenous Relations and	<i>Territorial Lands Act (R.S.C., 1985, c. T-7)</i>
	- Nunavut Mining Regulations (SOR/2014-69)
	- Territorial Land Use Regulations (C.R.C., c. 1524)

Agency / Entity	Legislation, Regulations and Municipal By-laws
Northern Affairs Canada (CIRNAC)	- Nunavut Mining Regulations, SOR/2014-69
	- Territorial Quarrying Regulations (C.R.C., c. 1527)
Natural Resources Canada (NRCan)	<i>Explosives Act (R.S.C., 1985, c. E-17)</i>
	- Explosives Regulations, 2013 (SOR/2013-211)
Public Safety Canada (PSC)	<i>Firearms Act (S.C. 1995, c. 39)</i>
Department of Fisheries and Oceans (DFO)	<i>Fisheries Act (R.S.C., 1985, c. F-14)</i>
Transport Canada (TC)	<i>Marine Transportation Security Act (S.C. 1994, c. 40)</i>
	- Marine Transportation Security Regulations (SOR/2004-144)
	<i>Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c. 34)</i>
	- Transportation of Dangerous Goods Regulations (SOR/2001-286)
Government of Nunavut	
Government of Nunavut (GN)	<i>Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada</i>
Department of Education (GN-DOEd)	<i>Apprenticeship, Trade and Occupations Certification Act, RSNWT (Nu) 1988, c A-4</i>
Department of Community and Government Services (GN-CGS)	<i>Commissioner's Land Act, CSNu, c C-130</i>
	<i>Fire Safety Act, RSNWT (Nu) 1988, c F-6</i>
	- Fire Prevention Regulations, RRNWT (Nu) 1990 c F-12
	- Propane Cylinder Storage Regulations, NWT Reg (Nu) 094-91
	<i>Gas Protection Act, RSNWT (Nu) 1988, c G-2</i>
Department of Environment (DOE)	<i>Nunavut Planning and Project Assessment Act, S.C. 2013, c.14, s.2</i>
	<i>Environmental Rights Act, RSNWT (Nu) 1988, c 83 (Supp),</i>
	- Spill Contingency Planning and Reporting Regulations r-068-93
	<i>Wildlife Act, SNU 2003, c 26</i>
	- Wildlife General Regulations, NWT Reg (Nu) 026-92
	- Critical Wildlife Areas Regulations, RRNWT (Nu) 1990 c W-3
	- Polar Bear Defence Kill Regulations, NWT Reg (Nu) 037-93

Agency / Entity	Legislation, Regulations and Municipal By-laws
	- Wildlife Management Barren-ground Caribou Areas Regulations, NWT Reg (Nu) 099-98 - Wildlife Management Polar Bear Areas Regulations, RRNWT (Nu) 1990 c W-13
Department of Culture and Heritage (GN-CH)	<i>Nunavut Act (S.C. 1993, c. 28)</i> - Nunavut Archaeological and Palaeontological Sites Regulations (SOR/2001-220)
Nunavut Research Institute (NRI)	<i>Scientists Act, RSNWT (Nu) 1988, c S-4</i> - Scientists Act Administration Regulations, NWT Reg (Nu) 174-96
Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) / Nunavut Water Board (NWB)	<i>Nunavut Waters and Nunavut Surface Rights Tribunal Act (S.C. 2002, c. 10)</i> Nunavut Waters Regulations (SOR/2013-69)
Department of Health (DOH)	<i>Public Health Act, SNu 2016, c 13</i> - General Sanitation Regulations, RRNWT (Nu) 1990 c P-16 - Public Water Supply Regulations R-050-2019
Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut (WSCC)	<i>Safety Act, RSNWT (Nu) 1988, c S-1</i> <i>Workers' Compensation Act, SNu 2007, c.15</i> <i>Explosives Use Act, RSNWT (Nu) 1988, c E-10</i>
Municipal	
City of Iqaluit	Noise Bylaw (#599, #739) General Specifications for Municipal Services

3.4 Performance Monitoring

The City will monitor, evaluate, track, and report on the performance of the EMP to maintain its effectiveness. Key elements of the monitoring and management processes will include measurement of environmental performance indicators as described in the EMP, field inspections, and internal and external audits. Monitoring results and/or summaries of results will be made available in English, French, Inuinnaqtun, and Inuktitut, to the extent feasible. All data collected and monitoring work for the Project will include at minimum the following information:

- The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations.
- The date, time, and place of sampling or measurement, and weather conditions.
- The date of analysis.
- The name of the person(s) who performed the analysis including any relevant accreditations.
- A description of the analytical methods or techniques used, and
- A discussion of the results of any analysis.

3.5 Permit Tracking Registry

The City will undertake the LTWP in compliance with regulatory permitting requirements. The City will establish, maintain, and update a permits, licenses, approvals, and agreements (PLAA) registry to identify and track legal and regulatory requirements that apply to the environmental aspects of construction and operations. These requirements will be integrated into the EMP. See Appendix B for the PLAA Tracker form.

The Environmental Manager will work collaboratively with the Design and Construction Teams to ensure that the PLAA accurately reflects the requirements of permits for the construction activities. The Environmental and Permitting Lead will communicate regularly with the design and construction teams to update and confirm understanding to support implementation and ensure compliance. Compliance will be monitored by comparing the known permitting and regulatory obligations to the applicable construction activities. The Environmental and Permitting Lead and the Construction Environmental Manager will track these through the PLAA updates.

The Environmental PLAA Tracker includes, but is not limited to, the following:

- Permit ID (Discrete ID).
- Permit Name.
- Agency.
- Typical Approval Time.
- Date Required By.
- Status.
- If during construction, the Construction Work Package.
- Engineering Inputs (drawings and specifications).
- Discipline Responsible.
- Fees (if required).

- Date Submitted.
- Expiry Date.
- Date Comments Received, and
- Approval Received.

The PLAA Tracker will be maintained, updated, and documented as appropriate throughout the Construction Period to reflect compliance with the EMP. The City will ensure the PLAA Tracker is handed over to and managed by the Engineering and Design Manager and the Construction Contractor's Environmental Manager once the design phase is completed and the final design (100%) has been approved.

3.6 Environmental Compliance Tracking and Reporting Matrix

The City will track and maintain the Project compliance obligations related to its environmental aspects using an Environmental Compliance Tracking and Reporting Matrix (ECTRIM). The ECTRIM will contain all the conditions of approval associated with the Environmental PLAs, the commitments of the EPR and associated studies during the design and construction phases. Please see Appendix C for a copy of the ECTRIM template.

The Project Manager is responsible for maintaining, updating and communicating the requirements from the ECTRIM to the design and construction teams to confirm understanding of the compliance requirements and effective implementation.

The ECTRIM will include:

- Item number (Discrete ID).
- Approval/permit/reference document.
- Authority Having Jurisdiction (AHJ).
- Requirement.
- Project phase.
- Status of commitment.
- Deadline for completion.
- Sign-off obtained (name & date), and

- Confirmation of completion.

The ECTRM will be maintained, updated and documented as appropriate throughout the Construction Period to reflect compliance with the EMP. The register will be available to the appropriate members of the Environmental Team through the monthly and annual Environmental Compliance Monitoring Reports.

4 Implementation

4.1 List of Subordinate Environmental Management Plans (SEMPs)

The environmental and contingency plans, subordinate to the EMP, will contain operational controls to be implemented as a key part of the actionable EMP process. These plans will include process-specific operating criteria and methods to help minimize or eliminate potential impacts of the Project’s environmental aspects. Table 9 describes the SEMP’s that are referenced this EMP though they are each their own standalone document. These plans may require modification on an ongoing basis as the project develops and will require revision and updating once the construction management plan is complete. The list of the SEMP’s is provided in Table 9 below.

Table 9 List of SEMP’s

Subordinate Environmental Management Plan	Description
Environmental Protection Plan (EPP)	An extension of the EMP; this plan expands on operational procedures related to compliance and administrative controls; environmental considerations and potential impacts of Project work; mitigation strategies and implementation of environmental protection measures; monitoring and inspection techniques; personnel training and certification, etc. The EPP is also intended to be a guidance document for site personnel for the planning and execution of Project activities as well as contingency and mitigation planning with regards to wildlife on and in the vicinity of the Project site. The specific purposes are to: identify potential concerns about wildlife and develop appropriate protection measures; provide instructions to site personnel regarding procedures and management of wildlife encounters; and provide a reference document for personnel when planning and/or conducting specific

Subordinate Environmental Management Plan	Description
	activities and working in specific areas, to ensure impacts with wildlife are minimized or eliminated.
Environmental Response Plan (ERP)	This contingency plan provides operational and reporting procedures in the event of unplanned events, accidents and emergencies that could potentially occur at the Project site during construction or operation. It includes a Comprehensive Spill Prevention and Response Plan, which considers hazardous waste, fuel handling, storage, disposal, spill prevention measures, staff training and equipment lists, and emergency contacts and reporting procedures for various emergencies. It details how to reduce the potential for accidents or malfunctions that could result in emergencies.
Erosion and Sediment Control Plan (ESCP)	This plan identifies the Project components and areas susceptible to erosion and sedimentation, site-specific mitigation measures, and monitoring approaches for reporting any changes in the environment during the different phases of the Project.
Site-Specific Health and Safety Plans	The project contract is to include emergency response plans, fire plans, and the identification of any additional site-specific issues. These plans are to be provided by the construction contractor before the start of the construction phase and is the responsibility of the environmental consultant to ensure that these plans are adequate and adhered to. The Construction Health and Safety Plan should be prepared by the <i>Safety Act</i>: Occupational Health and Safety Regulations as well as guidelines and Codes of Practice of the Workers' Safety and Compensation Commission.

4.2 Performance Evaluation

The City will monitor, evaluate, track, and report on the performance of the EMP to maintain its effectiveness. Key elements of the monitoring and management processes will include measurement of environmental performance indicators as described in the EMP and environmental plans, field inspections, and internal and external audits.

4.2.1 Environmental Effects Monitoring

The environmental effects that could potentially arise throughout the various activities of the LTWP are described in the Environmental Protection Plan (EPP). These effects were identified based on previous environmental studies and literature review, as well as on-site evaluations by subject specialists. The Construction Contractor's Environmental Manager will be responsible for regularly monitoring and assessing Project site activities for possible

effects on any specific environmental aspects and any other non-compliance issues during construction activities and promptly addressing these issues with the Construction Contractor's Project Manager.

4.2.2 Incident Reporting and Auditing

In the event of an environmental incident or external complaint, the City will act promptly to minimize the impact on the environment and community. Mitigation measures to respond to impacts will be developed and will be included in the respective SEMP. The mitigation measures will aim to minimize effects and implement mitigative actions to correct or restore the situation.

The Project's environmental performance can be assessed for compliance with the EMP and ISO 14001:2015 through internal audits conducted on elements of the EMP with the full system being assessed over a two-year cycle. The Environmental Manager will coordinate the internal audit program. In addition, an annual external audit can be conducted by an independent environmental consultant.

4.2.3 Competence and Training

Environmental specialists will hold a degree in environmental science, environmental engineering, biology, environmental technician, or a related field. Environmental specialists will have practical experience in environmental management. Previous experience in conducting environmental assessments, monitoring, and compliance evaluations will be utilized. Environmental specialists will have a strong understanding of the local, regional, and national environmental regulations applicable.

4.2.4 System Monitoring and Maintenance

Once the LTWP is operational, complete operational procedures, maintenance schedules, and emergency response plans will be made available to regulators.

Some components of the system that will require regular monitoring and inspections when operational include:

- RWPS equipment and control systems.
- Pipeline pathway for leaks or breaks.
- Valves throughout the system, including the function of manual shutoffs and any integrated automated shutoffs.
- Stability of berms and state of reservoir infrastructure.
- Evidence of any significant changes to the environment surrounding the associated water bodies, and
- Accessibility and maintenance of the Road to Nowhere.

4.2.5 Management Review

The City is committed to continuous improvement and ensuring ongoing suitability, adequacy and effectiveness of the EMP. The management review approach will include an annual review and update of the EMP that requires involvement by Senior Management. The annual review will adhere to ISO 14001.

Each EMP management review will support ongoing compliance with environmental requirements by considering the following:

- Previous management reviews action status.
- Changes in:
 - Internal and external issues relevant to this EMP.
 - Risks and opportunities.
 - Significant environmental aspects of this EMP.
 - The needs and expectations of interested parties, including compliance obligations.
- To what extent environmental objectives have been achieved.
- The City's environmental performance, including information and trends related to nonconformities and corrective actions, monitoring and measurement results, fulfilment of its compliance obligations, and audit results.
- Resource adequacy.
- Relevant communication(s) from interested parties, including issues/concerns raised, and
- Continuous improvement opportunities, including updates and improvements to objectives and targets.

As a result of the EMP review, outputs will include conclusions and decisions associated with the following:

- The adequacy and effectiveness of the EMP and its continuing suitability,
- Continual improvement opportunities,
- The need for changes to the EMP, including resources,
- Actions, as required, in the absence of achieving environmental objectives,

- Opportunities, as required, to improve integration of the EMP with other business processes, and
- Implications for the City's strategic direction.

5 Continual Improvement

The City is committed to continuously improving the Project's environmental performance, which will be accomplished through a process that:

- Receives input from all stakeholders, including regulators, employees, external providers, and Inuit and the local community.
- Solicits feedback from regulators, Inuit, and the public to understand their needs and expectations and to assess their satisfaction.
- Enables people to identify constraints of their performance, and to actively seek opportunities to enhance their competence, knowledge, and experience.
- Creates an environment in which everyone can openly discuss problems and issues and freely share their knowledge and experience.
- Continuously improves the EMP through critical reviews at management review meetings.
- Recognizes and acknowledges improvements, and
- Makes continual improvements to the Project's implementation.

5.1 Non-conformance and Corrective Action

The City will complete any preventive and corrective actions on a timely basis and preventive repair or rework will be approved before actions begin. The City Project Manager, in cooperation with the Construction Environmental Monitor, will verify the completion of preventive and corrective actions.

Lessons learned will be identified from these preventive and corrective actions through root cause analysis and this knowledge will be incorporated to enhance and improve the EMP on an ongoing basis. All members of the project hierarchy outline in the Section 2.3 will review these opportunities for changes to the EMP.

A Non-Conformance Report (NCR) Log will be maintained to keep track of NCRs and Corrective Actions. A copy of the NCR Log is available in Appendix D.

5.2 Change Management

The City Project Manager will review and oversee modifications and updates to the EMP, annually at minimum, with support from the Environmental Team, as needed.

The City will consider both planned and unplanned changes in circumstances affecting the intended outcomes of the EMP on an ongoing basis which may include, but are not limited to:

- Changes in environmental compliance obligations.
- Changes in project personnel or its subcontractors.
- Unanticipated changes based on additional information, impacts, or technologies associated with environmental aspects, and
- Anticipated changes to products, processes, operations, equipment, or facilities associated with environmental aspects.

Identification of changes will occur through various processes such as:

- Consideration of changes or modifications to activities and services associated with environmental aspects and abnormal or emergencies.
- Changes in legal and other requirements reviewed.
- Internal project communications.
- Operational planning and controls procedures.
- Monitoring and measurement activities, and
- Management review of the EMP.

EMP tracking includes maintaining records of complaints, work stoppages, notices from authorities, environmental training, and environmental toolbox talks

Appendix A

Environmental Aspects Interaction Matrix

Environmental Aspects Interactions Matrix

Project Name: LONG TERM WATER PROJECT - RAW WATER SUPPLY AND STORAGE
Client: City of Iqaluit
Project Number: 30192375
Date: September 2024

Project Components / Activities	Environmental Aspects																	
	Physical Environment										Biological Environment				Socio-Economic Environment			
	Designated Environmental areas	Ground Stability	Permafrost	Hydrology / Limnology	Water Quality	Climate Conditions	Eskers and Other Unique or Fragile Landscapes	Surface and Bedrock Geology	Sediment and Soil Quality	Tidal Process and Bathymetry	Air Quality	Noise levels	Terrestrial Vegetation	Terrestrial Wildlife and Habitat	Species at Risk and Migratory Birds	Aquatic Species and Habitat	Archaeological and Cultural Historic Site	Employment
Planning and Design Phase																		
Geotechnical Drilling					X				X				X	X			X	
Ecological Surveys													X	X	X			
Surveying													X					
Construction Phase																		
Ground Clearing		X			X				X		X	X	X	X	X		X	
Laydown Areas, Access Roads, New Reservoir Dam and Pipeline Construction		X	X										X	X	X			X
Dewatering of Existing Waterbodies				X					X					X	X	X	X	X
RWPS and Water Conveyances Construction			X										X	X				

Environmental Aspects Interactions Matrix

Project Name: LONG TERM WATER PROJECT - RAW WATER SUPPLY AND STORAGE
Client: City of Iqaluit
Project Number: 30192375
Date: September 2024

Project Components / Activities	Environmental Aspects																	
	Physical Environment										Biological Environment				Socio-Economic Environment			
	Designated Environmental areas	Ground Stability	Permafrost	Hydrology / Limnology	Water Quality	Climate Conditions	Eskers and Other Unique or Fragile Landscapes	Surface and Bedrock Geology	Sediment and Soil Quality	Tidal Process and Bathymetry	Air Quality	Noise levels	Terrestrial Vegetation	Terrestrial Wildlife and Habitat	Species at Risk and Migratory Birds	Aquatic Species and Habitat	Archaeological and Cultural Historic Site	Employment
Erosion Control		X		X	X				X				X	X		X		X
Blasting		X	X	X	X	X		X	X		X	X	X	X	X	X		X
Equipment Refuelling, Hazardous Materials and Waste					X				X				X	X	X	X		X
Heavy Machinery		X				X					X	X	X	X	X	X		X
Construction Noise												X		X				X
Operation Phase																		
RWPS and Water Conveyance Maintenance						X					X							
Dam, Laydown Areas, Access Roads, and Pipeline Maintenance				X											X	X		

Environmental Aspects Interactions Matrix

Project Name: LONG TERM WATER PROJECT - RAW WATER SUPPLY AND STORAGE
Client: City of Iqaluit
Project Number: 30192375
Date: September 2024

Project Components / Activities	Environmental Aspects																
	Physical Environment										Biological Environment				Socio-Economic Environment		
	Designated Environmental areas	Ground Stability	Permafrost	Hydrology / Limnology	Water Quality	Climate Conditions	Eskers and Other Unique or Fragile Landscapes	Surface and Bedrock Geology	Sediment and Soil Quality	Tidal Process and Bathymetry	Air Quality	Noise levels	Terrestrial Vegetation	Terrestrial Wildlife and Habitat	Species at Risk and Migratory Birds	Aquatic Species and Habitat	Archaeological and Cultural Historic Site
Pumping Water				X	X	X									X	X	
Operation of vehicles						X					X						
Storage of fuels					X				X								X

Appendix B

Permits, Licenses, Approvals and Agreements Tracker (PLAA)

Project Name: City of Iqaluit - Long Term Water Project
Client: City of Iqaluit
Project Number: 30192375
Date: September 2024

	ID	Permit Name	Agency Reference	Agency	Approval Date	Date Required	Status	Construction Package	Engineering Inputs	Discipline Responsible	Fees	Date Submitted	Expiry Date	Date Comments Received	Approval Received
FEDERAL AGENCIES	1	Geotechnical Drilling, Niaqunguk (Apex) River, Iqaluit (24-HCAA-00575) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat	24-HCAA-00575	Department of Fisheries and Oceans (DFO)	23-May-24	None	Completed	Planning & Design	Geotechnical drilling program	Geotechnical Drilling	None		None	23-May-24	23-May-24
	2														
	3														
	4														
TERRITORIAL AGENCIES	5	Conformity Determination - Long Term Water Project - Geotechnical Investigation	NPC File No. 1550099	Nunavut Planning Commission (NPC)	23-Jun-23	None	Completed	Planning & Design	Geotechnical drilling program	Geotechnical Drilling	None		None		23-Jun-23
	6	Notice Of Release Of Screening Decision Report	NIRB File No: 23YN040 Application No.: 125845	Nunavut Impact Review Board (NIRB)	02-Nov-23	None	Completed	Planning & Design	Geotechnical drilling program	Geotechnical Drilling	None		None		02-Nov-23
	7	Class 2 Nunavut Territory Archaeologist Permit : Archaeological Impact Assessment City of Iqaluit: Long-Term Water Project.	No. 2023-52A	Government of Nunavut Department of Culture and Heritage	14-Jul-23	None	Completed	Planning & Design	Archeological	Planning	None		31-Dec-23		14-Jul-23
	8														
	9														
	10														
OTHER AGENCIES	17														
	18														
	19														
	20														
	21														

Appendix C

Environmental Compliance Tracking and Reporting Matrix (ECTRIM)

Project Name: City of Iqaluit - Long Term Water Project

Client: City of Iqaluit

Project Number: 30192375

Date: September 2024

Item No. (Yr-XX)	Approval, Permit or Reference Document	Authority Having Jurisdiction (AHJ)	Requirement	Project Phase	Status of Commitment	Deadline for Completion (yyyy-mm-dd)	Sign-off Obtained (Name & Date yyyy-mm-dd)	Confirmation of Completion
24-01								
24-02								
24-03								

Appendix D

Non-Conformance Report (NCR) Log

Project Name: City of Iqaluit - Long Term Water Project

Client: City of Iqaluit

Project Number: 30192375

Date: September 2024

Item No. (Yr-XX)	Approval, Permit or Reference Document	Authority Having Jurisdiction (AHJ)	Requirement	Project Phase	Status of Commitment	Deadline for Completion (yyyy-mm-dd)	Sign-off Obtained (Name & Date yyyy-mm-dd)	Confirmation of Completion
24-01								
24-02								
24-03								

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