Application for Water Licence Amendment

Document Date: April 2013

Application Submission Date: _11/30/2016_____
Month/Day/Year

P.O. BOX 119
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NUNAVUT IMALIRIYIN KATIMAYIT
NUNAVUT WATER BOARD
OFFICE DES EAUX DU NUNAVUT

DOCUMENT MANAGEMENT

Original Document Date: April 2010

DOCUMENT AMENDMENTS

	Description	Date
(1)	Updated for public distribution as separate document from NWB Guide 7	June 2010
(2)	Updated NWB logos and reformatted table to allow rows to break across page	May 2011
(3)	New NWB logo; request for background information; and change to Block 24	April 2013
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		

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OFFICE DES EAUX DU NUNAVUT

APPLICATION FOR WATER LICENCE AMENDMENT

The applicant is referred to the NWB's Guide 7: *Licensee Requirements Following the Issuance of a Water Licence* for more information about this application form.

Where possible, provide background information regarding the original licence application or attach previously submitted information.

EXISTING LICENCE NO: 3AM-IQA1626___

1. LICENSEE CONTACT INFORMATION

Is the licensee the same as that referred to on the existing licence?

☒ Yes ☐ No

If No, a licence assignment must be completed and approved by the NWB. **An amendment will only be issued in the name of the current licensee in the absence of assignment of the licence.**

If the licensee is the same, but the name of the licensee has changed, attach a certificate of name change.

Name: *City of Iqaluit*

Address: *PO Box 460*
Iqaluit, Nunavut X0A 0H0

Phone: *867 979-5600*
Fax: *867 979-5922*
Email: *info@city.iqaluit.nu.ca*

2. LICENSEE REPRESENTATIVE CONTACT INFORMATION – If different from Block 1.

Name:
Mr. Greg Johnson, P.Eng., M.Sc.A.
Project Director - Qikiqtaaluk Environmental

Address:
2027 Iqaluit Lane, PO Box 1228
Iqaluit, Nunavut X0A 0H0

Phone: *866 634-6367*
Email: *gjohnson@qenv.ca*
(See attached letter of authorization from the City of Iqaluit, presented in Appendix A.)

3. NAME OF PROJECT

Has the name of the project changed?

☐ Yes ☒ No

If Yes, indicate the name of the project including the name of the location: _____

4. LOCATION OF UNDERTAKING

Does the proposed amendment change the location of the amended undertaking?

☐ Yes ☒ No

Provide the project extents and camp locations. Identify proposed changes.

Project Extents

NW:	*Latitude: (63° 50' 56.31" N)*	Longitude: *(68° 39' 49.87" W)*
NE:	*Latitude: (63° 43' 48.91" N)*	Longitude: *(68° 18' 12.53" W)*
SE:	*Latitude: (63° 41' 06.60" N)*	Longitude: *(68° 18' 18.82" W)*
SW:	*Latitude: (63° 44' 46.02" N)*	Longitude: *(68° 39' 43.10" W)*

Camp Location(s) – *Not Applicable*

Latitude: (° ' " N) Longitude: (° ' " W)

5. MAP

Does the proposed amendment change the locations of any of the main components of the undertaking?

☐ Yes ☒ No

Attach a topographical map, indicating the main components of the undertaking. Identify proposed changes.

NTS Map Sheet No.: *25N10* Map Name: *HILL ISLAND* Map Scale: *1:30,000*

Map presented in Appendix B

Only change is the addition of the bioreactor storage basin for the treatment of the contaminated water and the associated water treatment equipment.

6. NATURE OF INTEREST IN THE LAND

Does the proposed amendment change the nature of the interest in the land?

☐ Yes ☒ No

If Yes, indicate changes. _____

Check any of the following that are applicable to the proposed undertaking (at least one box under the 'Surface' header must be checked).

Sub-surface

☐ Mineral Lease from Nunavut Tunngavik Incorporated (NTI)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Mineral Lease from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

Surface

☐ Crown Land Use Authorization from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Inuit Owned Land (IOL) Authorization from Kitikmeot Inuit Association (KIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Kivalliq Inuit Association (KivIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Qikiqtani Inuit Association (QIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Commissioner's Land Use Authorization
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Other _____

Date (expected date) of issuance: _____ Date of expiry: _____

Is the name of the entity(s) holding authorizations the same as that considered in the existing water licence?

☒ Yes ☐ No

If No, a licence assignment must be completed and approved by the NWB.

Name of entity(s) holding authorizations:

_____

7. NUNAVUT PLANNING COMMISSION (NPC) DETERMINATION

Indicate the land use planning area in which the existing project is located.

- ☐ North Baffin
- ☒ South Baffin
- ☐ Akunniq
- ☐ Keewatin
- ☐ Sanikiluaq
- ☐ West Kitikmeot

Does the proposed amendment change the land use planning area?

☐ Yes ☒ No

If yes, indicate the land use planning area in which the amended undertaking is located.

- ☐ North Baffin
- ☒ South Baffin
- ☐ Akunniq
- ☐ Keewatin
- ☐ Sanikiluaq
- ☐ West Kitikmeot

Was a land use plan conformity determination required from NPC prior to the issuance of the existing water licence?

☒ Yes ☐ No

If Yes, indicate date issued and attach copy. _*August 28,2015*_____ *presented in Appendix C*.

Does the proposed amendment change the original NPC conformity determination or the need to obtain one?

☒ Yes ☐ No

If Yes, indicate date issued (or expected) and attach a copy. _*January 15, 2017*_____
If No, provide written confirmation from NPC confirming that a land use plan conformity review is not required.

8. NUNAVUT IMPACT REVIEW BOARD (NIRB) DETERMINATION

Was a screening determination required from NIRB prior to the issuance of the existing water licence?

☒ Yes ☐ No

If Yes, indicate date issued and attach copy. __*November 3, 2014*_____ presented in Appendix D.

Does the proposed amendment change the original NIRB screening determination or the need to obtain one?

☒ Yes ☐ No

If Yes, indicate date issued (or expected) and attach a copy. _*January 15, 2017*_____
If No, provide written confirmation from NIRB confirming that a screening determination is not required.

9. DESCRIPTION OF UNDERTAKING

Does the proposed amendment change the description of the undertaking?

☐ Yes ☒ No

List and attach plans and drawings or project proposal. Identify proposed changes.

10. OPTIONS

Does the proposed amendment change any of the alternative methods and locations that were considered to carry out the project?

☐ Yes ☒ No

Provide a brief explanation of the alternative methods or locations that were considered to carry out the project. Identify proposed changes.

11. CLASSIFICATION OF PRIMARY UNDERTAKING

Indicate the primary classification of undertaking for the existing licence by checking one of the following boxes:

☐ Industrial
☐ Agricultural
☐ Mining and Milling (includes exploration/drilling/exploration camps)
☐ Conservation
☒ Municipal (includes camps/lodges)
☐ Recreational
☐ Power
☐ Miscellaneous (describe below):
_____

Does the proposed amendment change the classification of primary undertaking?

☐ Yes ☒ No

If Yes, indicate the primary undertaking of the amendment:_____

Information in accordance with applicable Supplemental Information Guidelines (SIG) must be updated and submitted with an Application for Amendment. Indicate which SIG(s) are applicable to your application.

☐ Hydrostatic Testing
☐ Tannery
☐ Tourist / Remote Camp
☐ Landfarm & On-Site Storage of Hydrocarbon Contaminated Soil
☐ Onshore Oil and Gas Exploration Drilling
☐ Mineral Exploration / Remote Camp
☐ Advanced Exploration
☐ Mine Development
☐ Municipal
☐ General Water Works
☐ Power

12. WATER USE

Indicate, using the boxes below, the types of water use(s) approved in the existing licence.

☒ To obtain water for camp/municipal purposes
☐ To obtain water for industrial purposes
☐ To cross a watercourse
☐ To alter the flow of, or store water
☐ Other: _____
☐ To divert a watercourse
☐ To modify the bed or bank of a watercourse
☐ Flood control

Does the proposed amendment change the type(s) of water use(s)?

☐ Yes ☒ No

If Yes, indicate using the boxes below, the proposed change(s) to the type(s) of water use(s) noting any water use(s) that are to be added, continued, or removed.

☐ To obtain water for camp/ municipal purposes
☐ To obtain water for industrial purposes
☐ To cross a watercourse
☐ To alter the flow of, or store water
☒ Other: *To store and treat landfill leachate and contact run-off water.*
☐ To divert a watercourse
☐ To modify the bed or bank of a watercourse
☐ Flood control

13. QUANTITY OF WATER INVOLVED

Does the proposed amendment change the source of water? ☐ Yes ☒ No

Indicate the water source(s). Identify proposed changes.:

The water to be used that applies to this amendment is from the Leachate Containment Pond at the Landfill Facility.

(show location(s) on map) – presented in Appendix B.

Does the proposed amendment change the quality of the water source and/or its available capacity?

☐ Yes ☒ No

Describe the quality of the water source(s) and the available capacity(s). Identify any changes.:_____

Does the proposed amendment change the overall quantity of water to be used?

☐ Yes ☒ No

Provide the overall estimated quantity to be used. Identify proposed changes.:

Does the proposed amendment change the quantity of water to be used from each source?

☐ Yes ☒ No

Provide the estimated quantity(s) of water to be used from each source. Identify proposed changes. :
Contact water from the City of Iqaluit Landfill will be treated prior to discharge to reduce contaminants.

Does the proposed amendment change the quantity of water to be used for each purpose?

☐ Yes ☒ No

Provide the estimated quantities to be used for each purpose (camp, drilling, etc.). Identify proposed changes.:

Does the proposed amendment change the method(s) of extraction? ☐ Yes ☒ No

Describe the method(s) of extraction. Identify proposed changes. :_____

Does the proposed amendment change the quantity(s) of water returned to source(s)?

☐ Yes ☒ No

Estimated quantity(s) of water returned to source(s). Identify proposed changes:

Does the proposed amendment change the quality(s) of water returned to source(s)?

☐ Yes ☒ No

Describe the quality(s) of water(s) returned to source(s). Identify any changes.:

Water will not be returned to source; it will be discharged into Koojesse Inlet. It will be treated to remove metals, suspended solids, BOD[1] and Nitrogen contamination to meet target levels set by Environment and Climate Change Canada, and to pass toxicity testing with Rainbow Trout.

1 Biochemical oxygen demand

14. WASTE

Check the appropriate box(s) to indicate the types of waste(s) approved in the existing licence.

- ☒ Sewage
- ☒ Solid Waste
- ☐ Hazardous
- ☒ Bulky Items/Scrap Metal
- ☐ Animal Waste
- ☐ Other (describe):_____
- ☐ Waste oil
- ☐ Greywater
- ☐ Sludges
- ☐ Contaminated soil and/or water

Does the proposed amendment change the type(s) of waste(s) to be generated or deposited?

☒ Yes ☐ No

If Yes, indicate using the boxes below, the proposed change(s) to the type(s) of waste(s) to be generated and/or deposited noting the addition, removal or continued generation and/or disposal of waste(s).

- ☐ Sewage
- ☒ Solid Waste
- ☐ Hazardous
- ☐ Bulky Items/Scrap Metal
- ☐ Animal Waste
- ☒ Other (describe): *Treated landfill leachate and contact water*
- ☐ Waste oil
- ☐ Greywater
- ☒ Sludges
- ☐ Contaminated soil and/or water

15. QUANTITY AND QUALITY OF WASTE INVOLVED

Does the proposed amendment change the quantity(s) of the types of wastes involved?

☒ Yes ☐ No

Does the proposed amendment change the composition(s) of the types of wastes involved?

☒ Yes ☐ No

Does the proposed amendment change the method(s) of treatment for the types of waste involved?

☒ Yes ☐ No

Does the proposed amendment change the method(s) of disposal for the types of waste involved?

☒ Yes ☐ No

If Yes to any of the above, describe the proposed changes:

This waste is landfill leachate and contact water. The treatment method used will be precipitation of metals thought pH adjustment, flocculation of suspended solids, biological treatment of BOD and ammonia Nitrogen, pH adjustment and filtration (refer to process flowcharts in Appendix B). Treated water that meets discharge targets will be discharged into Frobisher Bay; waste filter media will be disposed of at an authorized facility in Southern Canada.

For each type of waste indicated in Block 14, describe its composition, quantity in cubic meters/day, method of treatment and method of disposal.

Type of Waste	*Composition*	*Quantity Generated*	*Treatment Method*	*Disposal Method*
Solid Waste	*Waste filter media*	*1,000 kg of activated charcoal and 120 kg of ULTRASORPTION™ per year*	*Package according to regulations and transport south for disposal*	*Disposal at an authorized facility in Southern Canada*
Sludge	*Sludges from precipitation of metals and suspended solids*	*100 m³ per year*	*None required*	*In the City of Iqaluit Landfill*
Treated Water	*Water*	*500,000 L annually*	*Treat water*	*Discharge into Koojesse Inlet under the supervision of ECCC and INAC*

m.t. Metric tonne
ECCC Environment and Climate Change Canada
INAC Indigenous and Northern Affairs Canada

16. OTHER AUTHORIZATIONS

Does the proposed amendment change the need for other authorizations in addition to the sub-surface and surface land use authorizations provided in Block 6?

☐ Yes ☒ No

If Yes, indicate any additional authorizations required, which authorizations are no longer required, and which authorizations continue to be required.

For each provide the following:

Authorization: _____

Administering Agency: _____

Project Activity: _____

Date (expected date) of issuance: _____ Date of expiry: _____

17. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES

Does the proposed amendment change the predicted environmental impacts of the undertaking or the mitigation measures?

☐ Yes ☒ No

Describe direct, indirect, and cumulative impacts related to water and waste. Identify any changes.

18. WATER RIGHTS OF EXISTING AND OTHER WATER USERS

Was compensation paid and/or an agreement(s) for compensation been entered into with any existing or other users of water during consideration of the existing licence?

☐ Yes ☒ No

If Yes, provide the names, addresses and the nature of water use by those persons or properties.

Does the proposed amendment adversely affect any known persons or property including those that hold licences for water use in precedence to the application, domestic users, in-stream users, authorized waste depositors, owners of property, occupiers of property, and/or holders of outfitting concessions, registered trapline holders, and holders of other rights of a similar nature?

☐ Yes ☒ No

If Yes, provide the names, addresses and the nature of water use of those persons or properties.

Advise the Board if compensation has been paid and/or an agreement(s) for compensation has been reached with any existing or other water users with respect to the proposed amendment.

19. INUIT WATER RIGHTS

Was compensation paid/ or an agreement(s) for compensation been entered into with any Designated Inuit Organization (DIO) during consideration of the existing licence?

☐ Yes ☒ No

If Yes, which DIO(s) _____

Does the proposed amendment substantially affect the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL)?

☐ Yes ☒ No

If Yes, advise the Board if negotiations have commenced or an agreement to pay compensation for any loss or damage has been reached with one or more DIO(s) with respect to the proposed amendment.

20. CONSULTATION - Provide a summary of any consultation meetings including when the meetings were held, where and with whom. Include a list of concerns expressed and measures to address concerns.

No consultations were held related to this project

21. SECURITY INFORMATION

Does the proposed amendment change the financial security assessment?

☐ Yes ☒ No

Does the proposed amendment change the estimate of the total financial security for final reclamation?

☐ Yes ☒ No

Provide an estimate of the total financial security for final reclamation equal to the total outstanding reclamation liability for land and water combined sufficient to cover the highest liability over the life of the undertaking. Estimates of reclamation costs must be based on the cost of having the necessary reclamation work done by a third party contractor if the operator defaults. The estimate must also include contingency factors appropriate to the particular work to be undertaken. Identify any changes in the financial security assessment resulting from the proposed amendment.

Where applicable, the financial security assessment should be prepared in a manner consistent with the principals respecting mine site reclamation and implementation found in the *Mine Site Reclamation Policy for Nunavut,* Indian and Northern Affairs Canada, 2002.

Not applicable

22. FINANCIAL INFORMATION

Is the statement of financial security the same as that considered in the existing water licence?

☒ Yes ☐ No

Provide an updated statement of financial security.

If the applicant is a business entity please answer the questions below:

Is the list of the officers of the company the same as those considered in the existing water licence?

☐ Yes ☐ No – *N/A*

Provide a list of the officers of the company.

Is the Certificate of Incorporation or evidence of registration of the company name the same?

☐ Yes ☐ No – *N/A*

Attach a copy of the Certificate of Incorporation or evidence of registration of the company name.

23. STUDIES UNDERTAKEN TO DATE

List and attach updated studies, reports, research etc.

No studies have been undertaken

Provide a compliance assessment and status report including a response to any inspector's reports. The licensee must contact the NWB for licence specific direction in completing the assessment and report.

One inspection report is attached in Appendix E.

If in non-compliance, a licence may not be issued until compliance is achieved. If in non-compliance, attach plans/reports for consideration. Application will not be processed if significant issues of non-compliance exist.

This amendment application is in response to the observations made during the April 2016 INAC Inspection regarding the West 40 Landfill Post Fire Restorative Work.

24. PROPOSED TIME SCHEDULE

When are proposed amendments scheduled to be undertaken: *June 2017*

Does the proposed amendment change the time schedule considered in the existing licence for any phase of development?

☐ Yes ☒ No

Indicate the start and completion dates for each applicable phase of development (construction, operation, closure, and post closure). Identify proposed changes.

Construction
Proposed Start Date: *06/2016* (month/year) Proposed Completion Date: *06/2016* (month/year)

Operation
Proposed Start Date: *06/2016* (month/year) Proposed Completion Date: *Unknown* (month/year)

Closure
Proposed Start Date: *Unknown* (month/year) Proposed Completion Date: *Unknown* (month/year)

Post - Closure
Proposed Start Date: *Unknown* (month/year) Proposed Completion Date: *Unknown* (month/year)

For each applicable phase of development indicate which season(s) activities occur.

Construction
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

Operation
☐ Winter ☒ Spring ☒ Summer ☒ Fall ☐ All season

Closure
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season – N/A

Post - Closure
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season – N/A

25. PROPOSED TERM OF LICENCE

On what date does the existing licence expire? *June 16, 2026*

Is the Licensee applying for a combined renewal and amendment of the existing licence?

☐ Yes ☒ No

If Yes, indicate the proposed term of the renewal (maximum of 25 years): _____

Requested date of renewal issuance: _____ (month/year) Requested Expiry Date: _____ (month/year)

(The requested date of renewal issuance must be at least three (3) months from the date of application for a Type B water licence and at least one (1) year from the date of application for a type A water licence, to allow for processing of the water licence application. These timeframes are approximate and do not account for the time to complete any pre-licensing land use planning or development impact requirements, time for the applicant to prepare and submit a water licence application in accordance with any project specific guidelines issued by the NWB, or the time for the applicant to respond to requests for additional information. See the NWB's *Guide 5: Processing Water Licence Applications* for more information)

26. ANNUAL REPORTING

Will the proposed amendment change the content of annual reports or the annual report template?

☒ Yes ☐ No

If Yes, provide details regarding the content of annual reports and a proposed outline or template of the annual report.

Laboratory analytical reports from the treatment will be included with the annual reports.

27. CHECKLIST

The following must be included with the application for Amendment for the water licensing process to begin.

Completed Application for Water Licence Amendment form.

☒ Yes ☐ No If no, date expected _____

Information addressing Supplement Information Guideline (SIG), where applicable (see Block 11)

☐ Yes ☐ No If no, date expected *Not applicable*

Compliance Assessment / Status Report (see Block 23).

☐ Yes ☐ No If no, date expected *Not applicable*

Indication of Renewal Requirement (see Block 26)

☐ Yes ☐ No If no, date expected *Not applicable*

English Summary of Amendment Application.

☒ Yes ☐ No If no, date expected *Appendix F*

Inuktitut and/or Inuinnaqtun Summary of Amendment Application.

☒ Yes ☐ No If no, date expected *Appendix G*

Application fee of $30.00 CDN (Payee Receiver General for Canada).

☐ Yes ☒ No If no, date expected *January 15, 2017*

Water Use Fee Deposit of $30.00 CDN (Payee Receiver General for Canada). The actual water use fee will be calculated by the NWB based upon the amount of water authorized for use in accordance with the Regulations at the time of issuance of the licence.

☐ Yes ☐ No If no, date expected *Not applicable*

28. SIGNATURE

Greg Johnson, P.Eng., M.Sc.A.	Project Director, Qikiqtaaluk Environmental		2016-11-30
Name (Print)	**Title (Print)**	**Signature**	**Date**

APPENDIX A

City of Iqaluit Letter of Authorization

Iqaluit

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ᐅᖃᓕᑭᐅᑎᖓ (867) 979-5600
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Télécop. (867) 979-0866

29 November 2016

Greg Johnson, M.Sc.A., P.Eng.
Project Director
Qikiqtaaluk Environmental
Iqaluit, Nunavut X0A 0H0

Re: Authorization to Complete Water Licence Amendment Application

Mr. Johnson,

Please accept this letter as authorization to complete and submit an amendment application to Water Licence 3AM-IQA1626 on behalf of the City of Iqaluit for the West 40 Landfill run-off treatment process and infrastructure, and to act as representative of the City in communications with the Nunavut Water Board on this matter.

If you have any questions regarding the above please feel free to contact the undersigned at 979-5653.

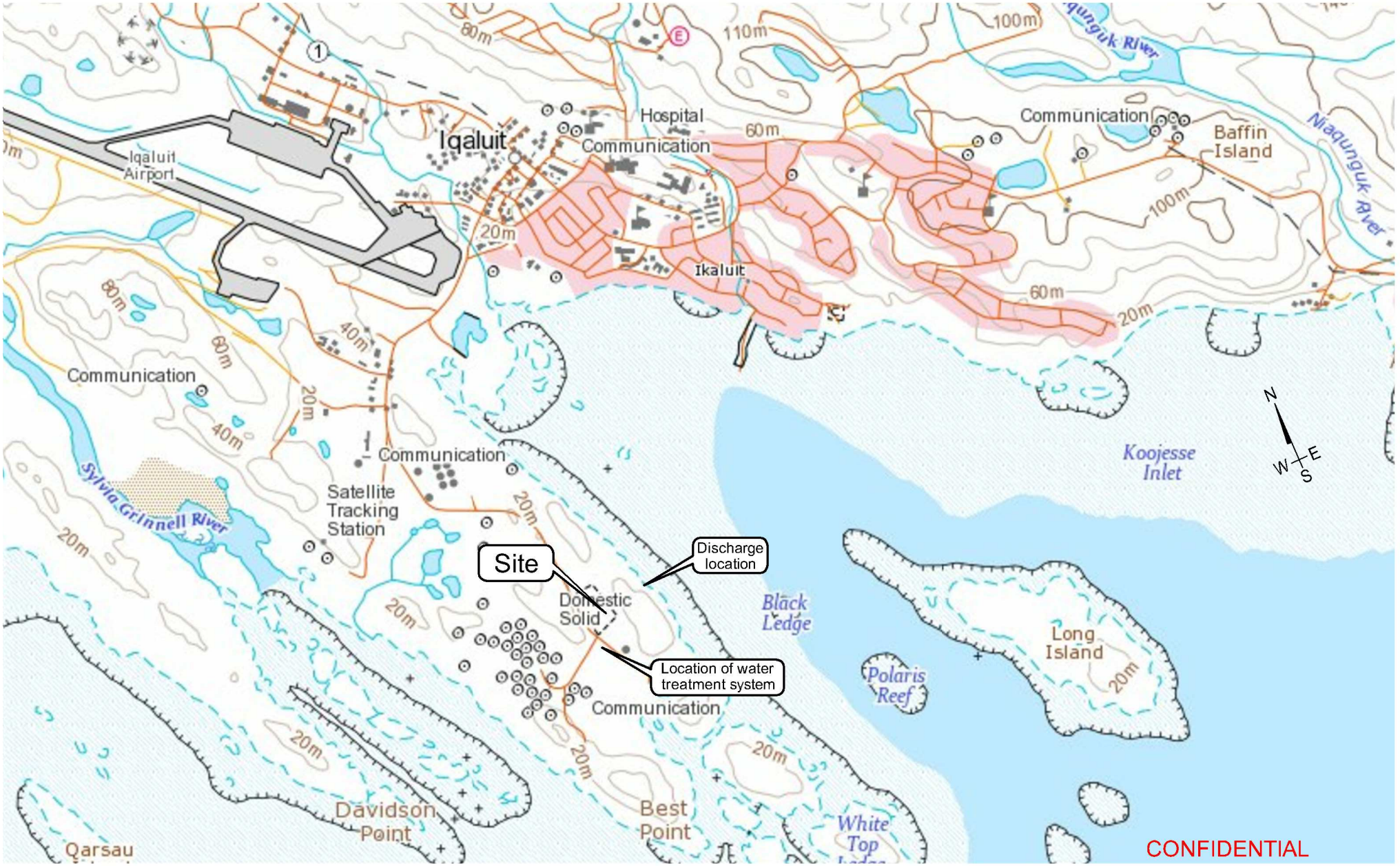
Sincerely,

Muhamud Hassan
Chief Administrative Officer
City of Iqaluit

cc: Matthew Hamp, Director of Public Works and Engineering, City of Iqaluit

APPENDIX B

Figures



This document shall not be used for construction, building or installation purposes.

Presented to:
Iqaluit

Property located at:
City of Iqaluit, Nunavut
Solid Waste Facility

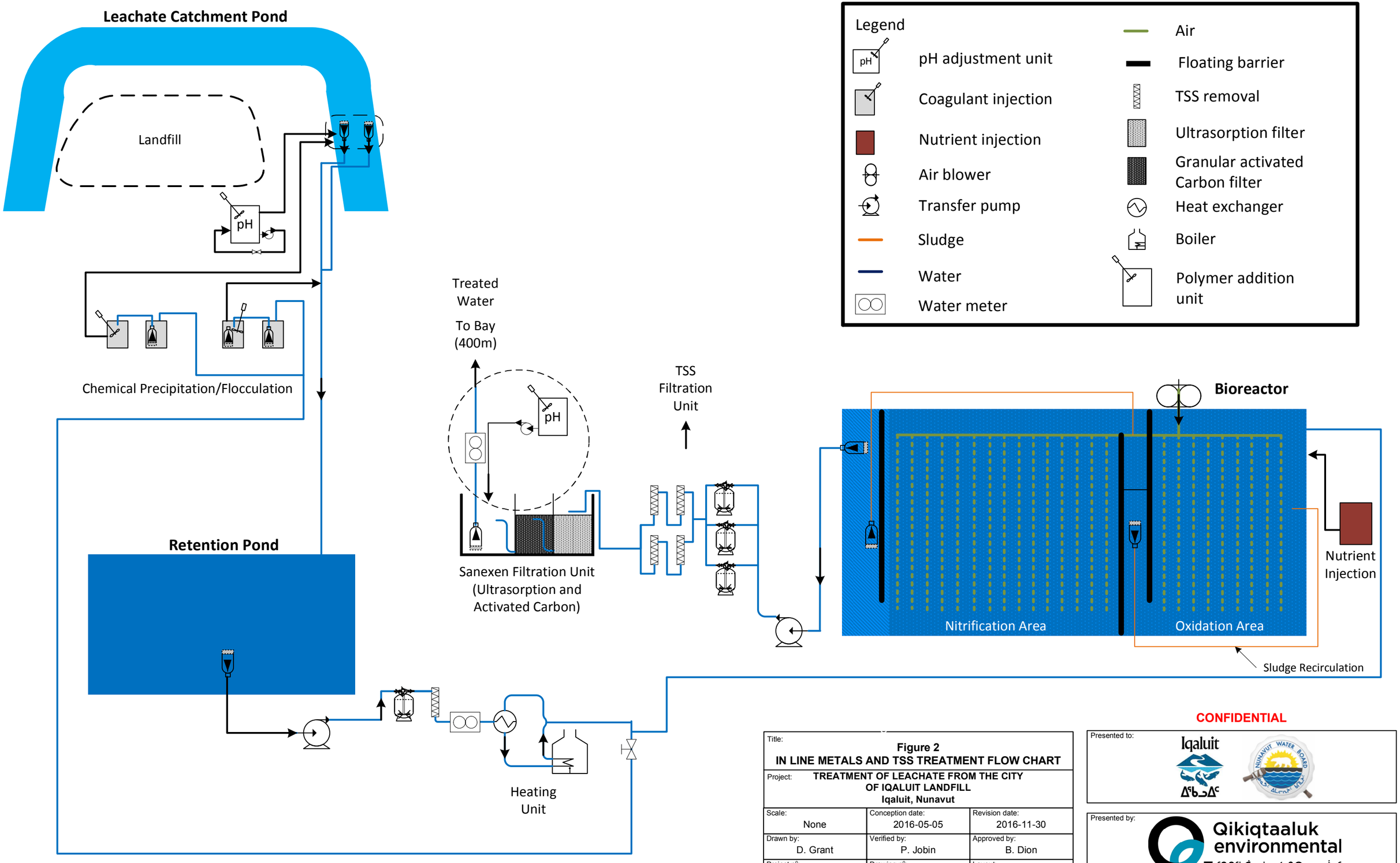
Figure 1

Site Plan Location

TREATMENT OF LEACHATE FROM THE CITY OF IQALUIT
LANDFILL, IQALUIT, NUNAVUT

Drawn by:	Verified by:	Approved by:	
D. Grant	G. Johnson	B. Dion	
Date:	Drawing no.:	Geodetic reference:	
2016-11-30	QE15-107-5-01 A	None	None

Qikiqtaaluk environmental

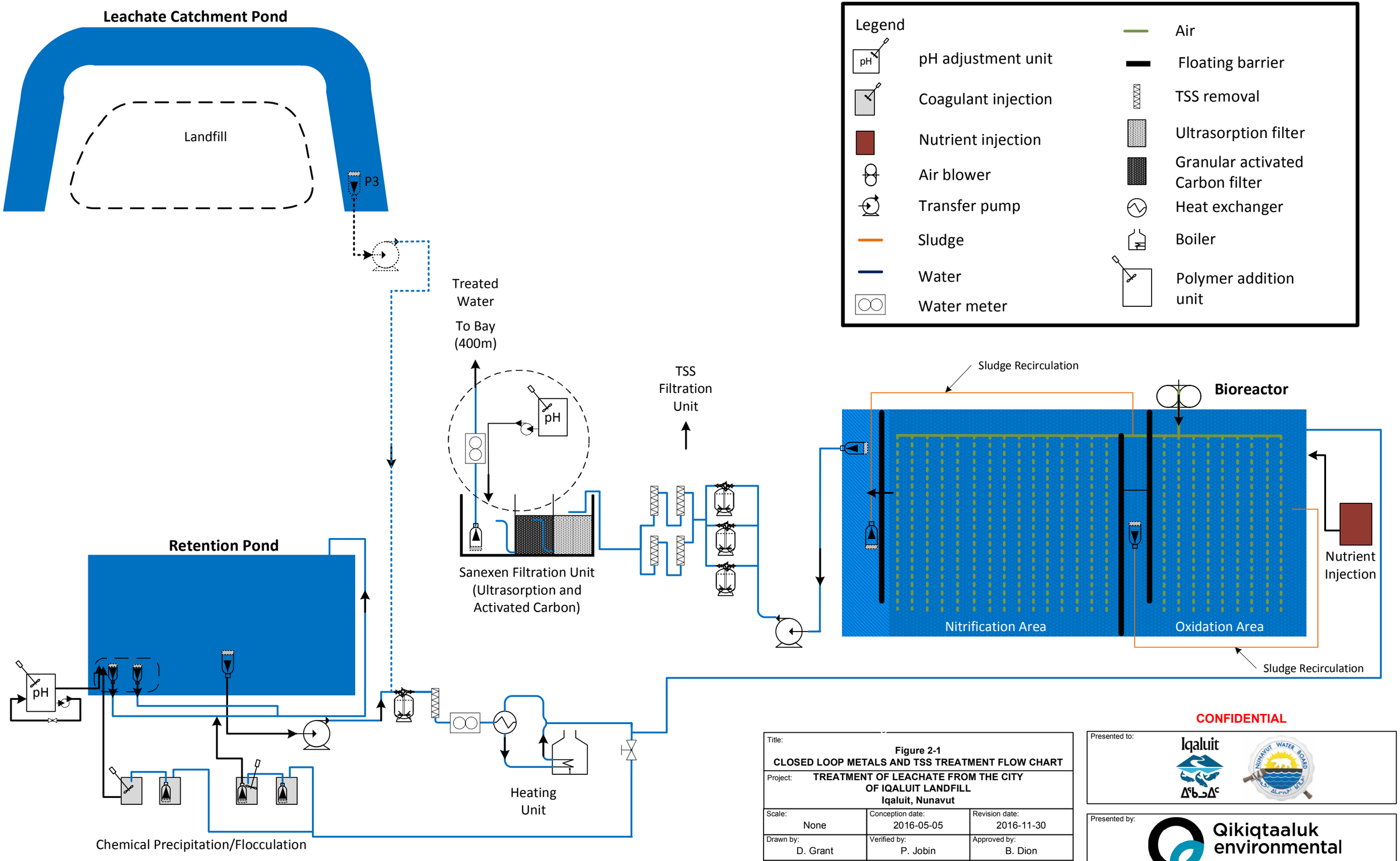


CONFIDENTIAL

Title: **Figure 2** **IN LINE METALS AND TSS TREATMENT FLOW CHART**		
Project: **TREATMENT OF LEACHATE FROM THE CITY OF IQALUIT LANDFILL** **Iqaluit, Nunavut**		
Scale: None	Conception date: 2016-05-05	Revision date: 2016-11-30
Drawn by: D. Grant	Verified by: P. Jobin	Approved by: B. Dion
Project n°: QE15-107-5	Drawing n°: QE15-107-5-01.vsd	Layout: A

Presented to: Iqaluit; Nunavut Water Board

Presented by: Qikiqtaaluk environmental

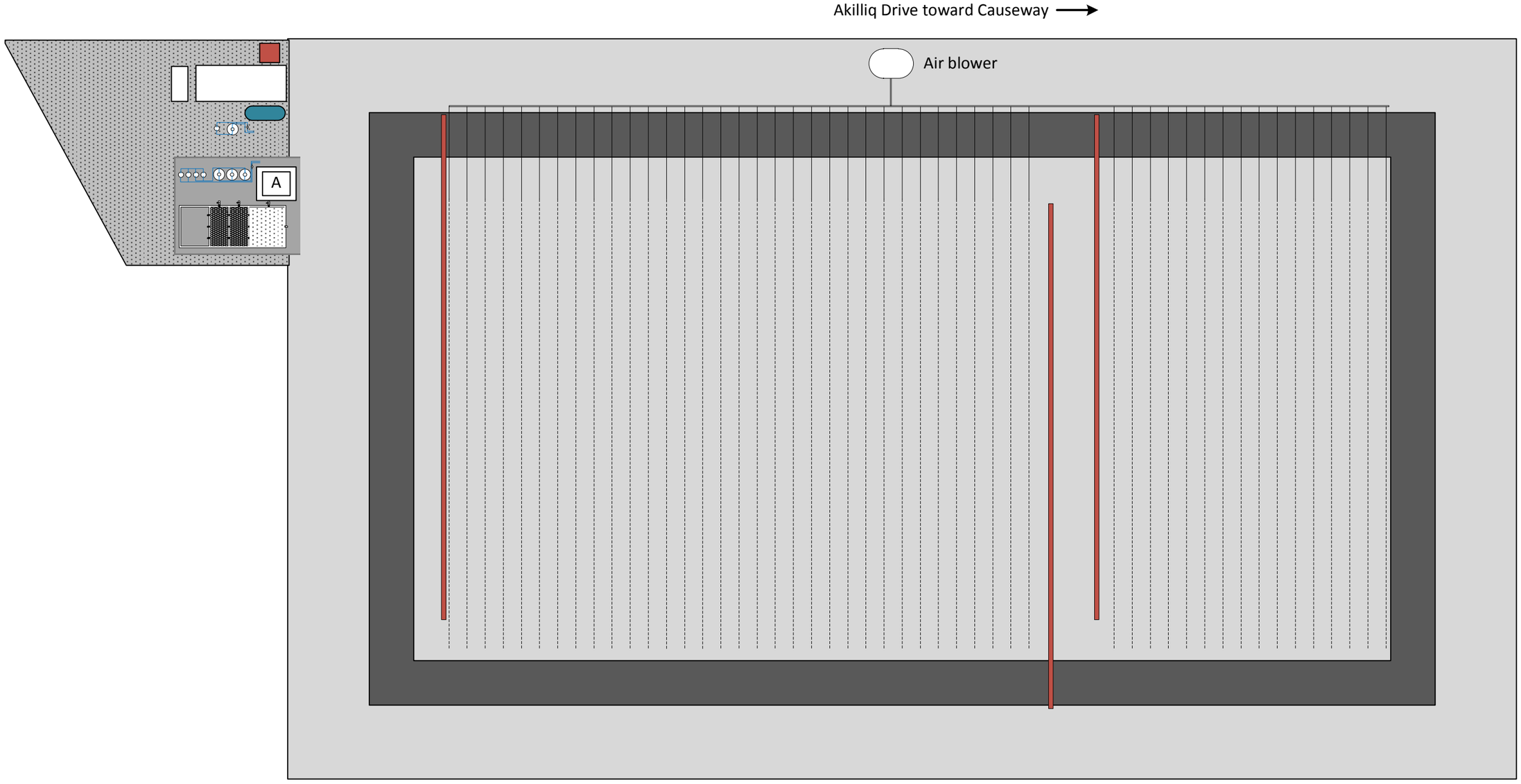


CONFIDENTIAL

Title: **Figure 2-1 CLOSED LOOP METALS AND TSS TREATMENT FLOW CHART**		
Project: **TREATMENT OF LEACHATE FROM THE CITY OF IQALUIT LANDFILL Iqaluit, Nunavut**		
Scale: None	Conception date: 2016-05-05	Revision date: 2016-11-30
Drawn by: D. Grant	Verified by: P. Jobin	Approved by: B. Dion
Project n°: QE15-107-5	Drawing n°: QE15-107-5-02.vsd	Layout: A

Presented to: Iqaluit; Nunavut Water Board

Presented by: Qikiqtaaluk environmental



Legend

- Generator
- Fuel tank
- A — Acid injection (H_2SO_4, 93%) with spill containment protection

CONFIDENTIAL

Title: **Figure 3 LOCATION OF FUEL TANK AND HAZARDOUS MATERIALS ON SITE**		
Project: **TREATMENT OF LEACHATE FROM THE CITY OF IQALUIT LANDFILL Iqaluit, Nunavut**		
Scale: None	Conception date: 2016-10-27	Revision date: 2016-11-30
Drawn by: D. Grant	Verified by: P. Jobin	Approved by: B. Dion
Project n°: QE15-107-5	Drawing n°: QE15-107-5-03.vsd	Layout: A

Presented to: Iqaluit; Nunavut Water Board

Presented by: Qikiqtaaluk environmental

APPENDIX C

NPC Conformity Determination

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Nunavunmi Parnaiyiit
Nunavut Planning Commission
Commission d'Aménagement du Nunavut

August 28, 2015

Muhamud Hassan
Chief Administrative Officer, Engineering Department
City of Iqaluit, P.O. Box 460, Iqaluit, NU, X0A 0H0

BY Email m.hassan@city.iqaluit.nu.ca

Dear Mr. Hassan,

RE: NWB 3AM IQA0612 – Type "A" Amendment

Further to previous communications including Mr. Clow's email this morning, Nunavut Planning Commission (NPC) has reviewed this file with the Nunavut Water Board (NWB) and understands that the Nunavut Impact Review Board (NIRB) issued an approval in late 2014; also, that there have been no modifications to the proposed project since then. As such, this file falls under 235. (1) of the *Nunavut Planning and Project Assessment Act* (NUPPAA), which states:

> "This Act does not apply in respect of
> *(a)* a project that is being assessed under the Agreement or is being, or has been, lawfully carried out on the day on which this section comes into force;…"

Therefore NPC is not required to undertake a review. As Mr. Clow stated, for any future projects the City of Iqaluit will need to submit a proposal to NPC.

If you have any questions or comments you can contact me at 867-857-2242.

Sincerely,

Peter Scholz, Senior Planner
Nunavut Planning Commission

cc. Paul Clow, Project Officer, City of Iqaluit Engineering Department
Robin Ikkutisluk, Nunavut Water Board
Tara Arko, Nunavut Impact Review Board

APPENDIX D

NIRB Determination

SCREENING DECISION REPORT
NIRB FILE NO.: 13UN034

AANDC File No.: 865340
NWB File No.: 3AM-IQA0611

November 3, 2014

To: The Honourable Bernard Valcourt
Minister of Aboriginal Affairs and Northern Development
10 rue Wellington
Gatineau, QC K1A 0H3

Cc: Thomas Kabloona
Chairperson, Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU

Sent via email: minister@aandc.gc.ca; bernard.valcourt@parl.gc.ca; thomas.kabloona@nwb-oen.ca

Re: Screening Decision for the City of Iqaluit's "Application for Water Licence Renewal" Project Proposal, Qikiqtani Region, 13UN034

Dear Mr. Bernard Valcourt:

The primary objectives of the Nunavut Impact Review Board (NIRB) are set out in Section 12.2.5 of the Nunavut Land Claims Agreement (NLCA) as follows:

> *"In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well-being of the residents of Canada outside the Nunavut Settlement Area."*

Section 12.4.4 of the NLCA states:

> *"Upon receipt of a project proposal, NIRB shall screen the proposal and indicate to the Minister in writing that:*

a) *the proposal may be processed without a review under Part 5 or 6; NIRB may recommend specific terms and conditions to be attached to any approval, reflecting the primary objectives set out in Section 12.2.5;*
b) *the proposal requires review under Part 5 or 6; NIRB shall identify particular issues or concerns which should be considered in such a review;*
c) *the proposal is insufficiently developed to permit proper screening, and should be returned to the proponent for clarification; or*
d) *the potential adverse impacts of the proposal are so unacceptable that it should be modified or abandoned."*

NIRB Assessment and Decision

After a thorough assessment of all material provided to the Board (please see *Procedural History* and *Project Activities* in **Appendix A**), in accordance with the principles identified within Section 12.4.2 of the NLCA, the decision of the Board as per Section 12.4.4 of the NLCA is:

> **12.4.4 (a)**: the proposal may be processed without a review under Part 5 or 6; NIRB may recommend specific terms and conditions to be attached to any approval, reflecting the primary objectives set out in Section 12.2.5.

Recommended Project-Specific Terms and Conditions (pursuant to Section 12.4.4(a) of the NLCA)

The Board is recommending that the following or similar project-specific terms and conditions be imposed upon the Proponent through all relevant legislation:

General

1. The City of Iqaluit (the Proponent) shall maintain a copy of the Project Terms and Conditions at the site of operation at all times.
2. The Proponent shall forward copies of all permits obtained and required for this project to the Nunavut Impact Review Board (NIRB) prior to the commencement of the project.
3. The Proponent shall operate in accordance with all commitments stated in correspondence comprising its project proposal as provided to the NIRB (revised NIRB Part 1 and Part 2 forms, July 15, 2014) and as formed its application with the Nunavut Water Board (Application for Water Licence Renewal, October 2, 2012; Annual Reports, Management Plans and Manuals, and applicable City policies, September 3, 2013 to July 16, 2014).
4. The Proponent shall operate the site in accordance with all applicable Acts, Regulations and Guidelines.

Water Use

5. The Proponent shall not extract water from any fish-bearing waterbody unless the water intake hose is equipped with a screen of appropriate mesh size to ensure that there is no entrapment of fish. Small lakes or streams should not be used for water withdrawal unless approved by the Nunavut Water Board.
6. The Proponent shall not use water, including constructing or disturbing any stream, lakebed or the banks of any definable water course unless approved by the Nunavut Water Board.

Fuel and Chemical Storage

7. Unless otherwise permitted, the Proponent shall locate all fuel and hazardous materials a minimum of thirty-one (31) metres away from the high water mark of any water body and in such a manner as to prevent their release into the environment.
8. Unless otherwise permitted, the Proponent shall ensure that re-fuelling of all equipment occurs a minimum of thirty-one (31) metres away from the high water mark of any water body.
9. The Proponent shall store all fuel and chemicals in such a manner that they are inaccessible to wildlife.
10. The Proponent shall use adequate secondary containment or a surface liner (e.g., self-supporting insta-berms and fold-a-tanks) when storing barreled fuel and chemicals at all locations and at all refueling stations. Appropriate spill response equipment and clean-up materials (e.g., shovels, pumps, barrels, drip pans, and absorbents) must be readily available during any transfer of fuel or hazardous substances, as well as at vehicle-maintenance areas and at drill sites.
11. The Proponent shall remove and treat hydrocarbon contaminated soils on site or transport them to an approved disposal site for treatment.
12. The Proponent shall ensure that all personnel are properly trained in fuel and hazardous waste handling procedures, as well as spill response procedures. All spills of fuel or other deleterious materials of any amount must be reported immediately to the 24 hour Spill Line at (867) 920-8130.

Landfill Operations

13. The Proponent shall dispose of non-hazardous materials only at the landfill and shall limit this disposal to those materials listed as acceptable for disposal. Hazardous materials, materials listed as unacceptable for disposal at the landfill, or materials that contain asbestos, fluorescent tubes or ozone depleting substances are not to be disposed of in the landfill and must be disposed of at an authorized facility, unless otherwise permitted.
14. The Proponent shall ensure that the site is kept free of debris through the use of fencing and other measures to limit wind dispersal of waste materials off-site.
15. The Proponent shall take appropriate dust suppression measures when conducting soil topping of landfill materials, or landfill capping activities.

16. All operations personnel shall be adequately trained prior to commencement of landfill operations, and shall be made aware of all operational guidelines and Proponent commitments relating to the Project.
17. The Proponent shall clearly stake all boundaries so they remain visible to other land users.
18. The Proponent shall ensure there is no obstruction of natural drainage, flooding or channel diversion from access or other structures or facilities.
19. The Proponent shall ensure that silt fences/curtains are installed down gradient of any construction activities.
20. The Proponent shall maintain an undisturbed buffer zone between the periphery of the landfill sites and the high water mark of any water body that is of an adequate distance to ensure erosion control.
21. The Proponent shall stockpile all overburden/topsoil generated during construction using proper erosion prevention measures. Upon completion of operation, the Proponent shall back fill, reclaim/re-contour and re-vegetate all disturbed areas.

Wildlife - General

22. The Proponent shall not harass wildlife. This includes persistently worrying or chasing animals, or disturbing large groups of animals. The Proponent shall not hunt or fish, unless proper Nunavut authorizations have been acquired.
23. The Proponent shall ensure that all project personnel are made aware of the measures to protect wildlife and are provided with training and/or advice on how to implement these measures.

Migratory Birds and Raptors Disturbance

24. The Proponent shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Proponent shall take precaution to avoid further interaction and or disturbance (e.g., a 100 metre buffer around the nests). If active nests of any birds are discovered (i.e. with eggs or young), the Proponent shall avoid these areas until nesting is complete and the young have left the nest.

Caribou Disturbance

25. The Proponent shall cease activities, including vehicle traffic along roadways, that may interfere with the migration or calving of caribou, until the caribou have passed or left the area.
26. The Proponent shall not block or cause any diversion to caribou migration, and shall cease activities likely to interfere with migration, such as movement of equipment or personnel, until such time as the caribou have passed.
27. During the period of May 15 to July 15, when caribou are observed within 1 km of project operations, the Proponent shall suspend all operations, including movement of equipment or personnel. Following July 15, if caribou cows or calves are observed within 1 km of project operations, the Proponent shall also suspend all operations in the vicinity, including movement of equipment or personnel, until caribou are no longer in the immediate area.

All-Weather Road and Ground Disturbance

28. The Proponent shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. Overland travel of equipment or vehicles must be suspended if rutting occurs.
29. The Proponent shall implement suitable erosion and sediment suppression measures on disturbed areas before, during and after construction in order to prevent sediment from entering any water body.
30. The Proponent shall ensure that all project vehicles are fitted with standard and well-maintained noise suppression devices, and that engine idling is also minimized.
31. The Proponent should consider the potential for public traffic to utilize project roads, and in its design features and consideration of public safety, ensure adequate posting of signage indicating speed limit(s) along the road and within project site(s).

Restoration of Disturbed Areas

32. The Proponent shall ensure that all disturbed areas are restored to a stable or pre-disturbed state to the extent possible upon reclamation and closure of project activities.
33. The Proponent shall remove all fuel and equipment upon abandonment and ensure that the landfill continued to be monitored as necessary to ensure long-term structural integrity until fully remediated.

Other

34. The Proponent should, to the extent possible, hire local people and consult with local residents regarding their activities in the region.
35. Any activity related to this application, and outside the original scope of the project as described in the application and considered within this decision, will be considered a new project and should be submitted to the NIRB for Screening.

MONITORING AND REPORTING REQUIREMENTS

In addition, the Board is recommending the following:

Updated Plans

1. The Proponent shall submit to the NIRB, Project-specific operational, mitigation and/or monitoring plans and details as updated and/or finalized including, but not limited to, the following:
    a. West 40 Landfill Decommissioning Plan;
    b. Spill Contingency Plan (to incorporate all updated plans and activities);
    c. Emergency Response Plan;
    d. Fire Safety Plan;
    e. Hazardous Waste Management Plan (including household hazardous waste and waste electronics);
    f. Abandonment and Restoration Plan;
    g. Solid Waste Management Plan;

h. Decommissioning plans for the Water Treatment Plant, West 40 Wastewater Treatment Plant and the proposed Solid Waste Management Site;
i. Operational, Contingency and Management Plan (Design and Operations and Maintenance Plan);
j. Site Development Plan;
k. Landfill Safety Plan; and
l. Site mapping showing all components.

OTHER NIRB CONCERNS AND RECOMMENDATIONS

In addition to the project-specific terms and conditions, the Board is recommending the following:

Bear and Carnivore Safety

1. The Proponent review the bear/carnivore detection and deterrent techniques outlined in "Safety in Grizzly and Black Bear Country" which can be down-loaded from this link: http://www.enr.gov.nt.ca/_live/documents/content/Bear_Safety.pdf. Note that some recommendations in this manual are also relevant to polar bears. There is a DVD about polar bears and safety available from Nunavut Parks at the following link http://www.nunavutparks.com/english/visitor-information/suggested-resources.html and a "Safety in Polar Bear Country" pamphlet from Parks Canada at the following link http://www.pc.gc.ca/eng/pn-np/nu/auyuittuq/visit/visit6/d/i.aspx.

2. Any problem wildlife or any interaction with carnivores should be reported immediately to the local Government of Nunavut, Department of Environment Conservation Office (Iqaluit Conservation Office, (867) 439-2004).

Species at Risk

3. The Proponent review Environment Canada's "Environment Assessment Best Practice Guide for Wildlife at Risk in Canada", available at the following link: http://epe.lac-bac.gc.ca/100/200/301/environment_can/cws-scf/environmental_assessment-ef/ea_best_practices_2004_e.pdf. The guide provides information to the Proponent on what is required when Wildlife at Risk, including *Species at Risk*, are encountered or affected by the project.

Change in Project Scope

4. All Authorizing Agencies shall notify the NIRB of any changes in operating plans or conditions associated with this project prior to any such change.

REGULATORY REQUIREMENTS

The Proponent is also advised that the following legislation may apply to the project:

1. The Proponent is advised that the *Canadian Environmental Protection Act* (http://laws.justice.gc.ca/en/C-15.31/) lists calcium chloride (CaCl) as a toxic substance.

2. The *Fisheries Act* (http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html).

3. The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (http://www.canlii.org/ca/sta/n-28.8/whole.html).

4. The *Migratory Birds Convention Act* and *Migratory Birds Regulations* (http://laws-lois.justice.gc.ca/eng/acts/M-7.01/).

5. The *Species at Risk Act* (http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html). Attached in **Appendix B** is a list of Species at Risk in Nunavut.

6. The *Wildlife Act* (http://www.canlii.org/en/nu/laws/stat/snu-2003-c-26/latest/snu-2003-c-26.html) which contains provisions to protect and conserve wildlife and wildlife habitat, including specific protection measures for wildlife habitat and species at risk.

7. The *Nunavut Act* (http://laws-lois.justice.gc.ca/eng/acts/N-28.6/). The Proponent must comply with the proposed terms and conditions listed in the attached **Appendix C**.

8. The *Transportation of Dangerous Goods Regulations*, *Transportation of Dangerous Goods Act* (http://www.tc.gc.ca/eng/tdg/safety-menu.htm), and the *Canadian Environmental Protection Act* (http://laws-lois.justice.gc.ca/eng/acts/C-15.31/). The Proponent must ensure that proper shipping documents accompany all movements of dangerous goods. The Proponent must register with the Government of Nunavut, Department of Environment Manager of Pollution Control and Air Quality at 867-975-7748.

Validity of Land Claims Agreement

Section 2.12.2
Where there is any inconsistency or conflict between any federal, territorial and local government laws, and the Agreement, the Agreement shall prevail to the extent of the inconsistency or conflict.

Dated November 3, 2014 at Churchill, MB.

Elizabeth Copland, Chairperson

Attachments:
Appendix A: Procedural History and Project Activities
Appendix B: Species at Risk in Nunavut
Appendix C: Archaeological and Palaeontological Resources Terms and Conditions for Land Use Permit Holders

Appendix A
Procedural History and Project Activities

Procedural History

On November 5, 2012 the Nunavut Impact Review Board (NIRB or Board) received the City of Iqaluit's (the Proponent) "Application for Water Licence Renewal" proposal directly from the Proponent. On November 14, 2012 the NIRB issued correspondence to the Proponent advising that the Board would be required to await a formal referral from an Authorizing Agency prior to commencing with its screening assessment. While awaiting referral from an Authorizing Agency, the NIRB conducted a preliminary completeness check and found that the proposal did *not* contain sufficient information to permit proper screening. On July 11, 2013 the NIRB issued correspondence to the Proponent outlining the additional information required and requesting that it be provided to the NIRB on or before July 25, 2013. On July 25, 2013 the NIRB received an indication from the Proponent that the requested information would be available on or before September 30, 2013, and again on August 28, 2013 the NIRB received an updated notice that information would be submitted to the Board by November 30, 2013. On October 21, 2013 the NIRB received a formal referral from the Nunavut Water Board (NWB) to commence screening of this proposal and on November 1, 2013 the NIRB issued an application acknowledgement, requested additional information and assigned the proposal file number 13UN034.

On December 2, 2013 the Board requested an extension to its screening timeline from the Minister of Aboriginal Affairs and Northern Development as it had not yet received the outstanding information from the Proponent as requested.

On February 5, 2014 the NIRB requested that the Proponent provide an update on the status of the requested information. On February 6, 2014 the Proponent noted that it had made additional submissions to the NWB and forwarded the requested information on hazardous waste management and the abandonment and restoration plan to the NIRB and further noted that it was completing the remaining requested documents. On March 26, 2014 the NIRB again requested that the Proponent provide an update on the status of the requested information.

On June 11, 2014 the NIRB further requested that the Proponent provide an indication as to its anticipated timing for submission of requested information, and on June 26, 2014 the Board received an updated notice that information would be submitted to the NIRB by July 15, 2014. On July 23, 2014 the Board received additional information from the Proponent as requested and proceeded with its assessment.

This project proposal was distributed to community organizations in Iqaluit, as well as to relevant federal and territorial government agencies, and Inuit organizations. The NIRB requested that interested parties review the proposal and provide the Board with any comments or concerns by October 9, 2014 regarding:

- Whether the project proposal is likely to arouse significant public concern; and if so, why;

- Whether the project proposal is likely to cause significant adverse eco-systemic and socio-economic effects; and if so, why;
- Whether the project is of a type where the potential adverse effects are highly predictable and mitigable with known technology, (providing any recommended mitigation measures); and
- Any matter of importance to the Party related to the project proposal.

On or before October 9, 2014 the NIRB received comments from the following interested parties (see Comments and Concerns section below):

- **Government of Nunavut (GN)**
- **Environment Canada (EC)**

On or before October 16, 2014 the NIRB also received submissions from the following interested parties:

- **Aboriginal Affairs and Northern Development Canada (AANDC)**
- **Fisheries and Oceans Canada (DFO)**

Comments and Concerns

The following is a *summary* of the comments and concerns received during the public commenting period for this file:

Government of Nunavut (GN):

- The GN noted concern with the Proponent's waste management plans, noting that they required modification and revision in order to mitigate potential adverse environmental impacts.
- The GN recommended that the Proponent update its Solid Waste Management Plan to incorporate information and expertise gained during the Iqaluit dump fires in the summer of 2014.

Aboriginal Affairs and Northern Development Canada (AANDC):

- AANDC submitted comments noting that in its view, Schedule 12-1, Item 3 of the Nunavut Land Claims Agreement (NLCA) would apply to exempt this project from screening because the project involves the "provision of a service within an established municipality".

Following the receipt of the AANDC comment submission, the Board issued correspondence to AANDC clarifying that as the Board has concluded that the project was not exempt from screening under NLCA Schedule 12-1, it would continue with the screening and would be issuing a Screening Decision Report to the Minister in due course.[1] This decision reflects the Board's consistent and long-standing approach to interpretation of the exemptions in NLCA

[1] The NIRB response to AANDC was provided on October 21, 2014 and is available from the NIRB's online public registry at: http://ftp.nirb.ca/01-SCREENINGS/ACTIVE%20SCREENINGS/13UN034-City%20of%20Iqaluit%20Type%20A%20Water%20Licence%20Renewal/02-DISTRIBUTION/CORRESPONDENCE/

Schedule 12-1 and the Board's specific analysis of this project proposal, specifically whereby the Nunavut Water Board's initial referral of the project proposal to the NIRB for assessment indicated that a public hearing would be required as a part of its licensing process. The NIRB notes that NLCA Schedule 12-1, item 5 may apply to proposals for which a water use did not require a public hearing pursuant to NLCA 13.7.3. Given the NWB notification of hearing, the NIRB remains of the opinion that assessment was both warranted, and required for this proposal.

Environment Canada (EC):

- EC provided general comments and recommendations regarding the following:
  - Prohibition of deleterious substances in waters frequented by fish, or in any place that a deleterious substance could enter such water, under the *Fisheries Act*; and
  - Potential impacts to wildlife, migratory birds and Species at Risk.
- EC noted that it was unclear whether the Proponent would be undertaking groundwater sampling and if so, where monitoring wells would be located.

Fisheries and Oceans Canada (DFO):

- DFO requested that the Proponent provide additional information regarding fish community(ies) and other aquatic species that may inhabit, use, or rely on, Lake Geraldine and/or the outlet stream of Lake Geraldine and the anticipated effects from the proposed activities, including the operation of the Lake Geraldine Dam on these communities and/or species.

- DFO made recommendations regarding avoiding harm to fish and fish habitat, use of fish screens on intake hoses, water withdrawal rates, and the identification of an alternative water source.

All comments provided to NIRB regarding this project proposal can be viewed on NIRB's public registry, at the following location:
http://ftp.nirb.ca/01-SCREENINGS/COMPLETED%20SCREENINGS/.

Project Activities

The proposed project is located in the South Baffin Region within the municipality of Iqaluit. The City of Iqaluit (the Proponent) is applying to renew and amend its Type A water licence (which expired in 2011 and was extended for a term of one year to 2012) with the NWB to upgrade existing and construct new waste management facilities in Iqaluit. The Proponent has requested a renewed term of licence from October 2013 to October 2018. The proposed project activities associated with the renewal and amendment application include:

- Upgrade, operation and the eventual decommissioning of the Water Treatment Plant and other associated systems that supply water extracted from Lake Geraldine for municipal use;
  - Proposed maximum annual withdrawal of 1,100,000 cubic metres (m^3) of water; to be gravity fed and transported to the Water Treatment Plant via a high density polyethylene insulated pipe 360 metres long and 400 millimetres in diameter;

- Storage of hazardous materials and chemicals (including hydrofluorosilicic acid, chlorine gas, caustic soda and sodium hypochlorite);

- Operation and the eventual decommissioning of a solid waste management facility at the existing West 40 Landfill and associated infrastructure;
  - Collection and separation of solid waste into general waste, metals, tires and hazardous waste:
    - Compaction of solid non-hazardous residential and commercial waste and covered with material such as crushed wood;
    - Scrap metal, tires, hazardous waste, and empty barrels/fuel drums stored and transported south for appropriate disposal;

- Upgrade, operation and decommissioning of infrastructure for managing wastewater at the existing West 40 Wastewater Treatment Plant and backup Sewage Lagoon;
  - Use of a utilidor system;
  - Contaminated snow transported to the sewage lagoon;

- Snow and soil contaminated with hazardous waste (e.g. fuel) treated and disposed of at Nunatta Environmental landfarm[2], which is within the Iqaluit municipality;

- Construction, operation, and the eventual decommissioning and closure of a new Solid Waste Management Site approximately 7.5 kilometres (km) northwest of Iqaluit;
  - Site survey and boundary delineation to take place as part of the design contract and projected in the spring of 2015;
  - Potential future development of incineration;

- Equipment to include:
  - Heavy equipment including loaders, garbage trucks, water and sewer trucks and shredder, as well as light vehicles;
  - Bulb buster (to safely extract mercury from florescent light bulbs before disposal), Freon remover, two pumps (one with two inch hose and one with four inch hose) at the retention pond;

- Storage of fuel in outside storage tanks with refueling to take place through a fuel distributor; and
- Construction of an access road approximately four (4) km northwest of Iqaluit and to be 8.5 m wide (not including the ditch and embankment) and 3.97 km long.

Within its application materials, the Proponent initially indicated that the scope of the Project would also include consideration of the following components and/or activities, however the Proponent had confirmed later in the assessment that none of these were to be included within the NIRB's current consideration and assessment. As such, the Board's consideration has not

[2] The NIRB notes that the Nunatta Environmental landfarm was previously screened by the NIRB (File No. 12UN019) and allowed to proceed subject to the terms and conditions contained within the NIRB's May 14, 2012 Screening Decision Report, and authorizations as required for the landfarm to proceed. The NIRB's Screening Decision Report is available online at: http://ftp.nirb.ca/01-SCREENINGS/COMPLETED%20SCREENINGS/2012/12UN019-Nunatta%20Environmental-Land%20Farm/03-DECISION/.

included the following activities, and additional assessment by the NIRB would be required at such time as the Proponent wishes to undertake these or other activities:

- Composting and recycling facility;
- Reuse centre;
- Supplementary water supply in additional to Geraldine Lake;
- Municipal Quarry; and
- Incineration of waste.

Appendix B
Species at Risk in Nunavut

This list includes species listed on one of the Schedules of SARA (*Species at Risk Act*) and under consideration for listing on Schedule 1 of SARA. These species have been designated as at risk by COSEWIC (Committee on the Status of Endangered Wildlife in Canada). This list may not include all species identified as at risk by the Territorial Government.

- Schedule 1 is the official legal list of Species at Risk for SARA. SARA applies to all species on Schedule 1. The term "listed" species refers to species on Schedule 1.
- Schedule 2 and 3 of SARA identify species that were designated at risk by the COSEWIC prior to October 1999 and must be reassessed using revised criteria before they can be considered for addition to Schedule 1.
- Some species identified at risk by COSEWIC are "pending" addition to Schedule 1 of SARA. These species are under consideration for addition to Schedule 1, subject to further consultation or assessment.

Schedules of SARA are amended on a regular basis so it is important to check the SARA registry (www.sararegistry.gc.ca) to get the current status of a species.

Updated: July 2013

Species at Risk [1]	**COSEWIC Designation**	**Schedule of SARA**	**Government Organization with Primary Management Responsibility** [2]
Peary Caribou	Endangered	Schedule 1	Government of Nunavut (GN)
Barren-ground Caribou (Dolphin and Union population)	Special Concern	Schedule 1	GN
Polar Bear	Special Concern	Schedule 1	GN
Short-eared Owl	Special Concern	Schedule 1	GN
Peregrine Falcon	Special Concern (*anatum-tundrius* complex[3])	Schedule 1	GN
Rusty Blackbird	Special Concern	Schedule 1	GN
Felt-leaf Willow	Special Concern	Schedule 1	GN
Porsild's Bryum	Threatened	Schedule 1	GN
Eskimo Curlew	Endangered	Schedule 1	Environment Canada (EC)
Ivory Gull	Endangered	Schedule 1	EC
Red Knot (*rufa* subspecies)	Endangered	Schedule 1	EC
Ross's Gull	Threatened	Schedule 1	EC
Red Knot	Special Concern	Schedule 1	EC

Species at Risk [1]	COSEWIC Designation	Schedule of SARA	Government Organization with Primary Management Responsibility [2]
(*islandica* subspecies)			
Harlequin Duck (Eastern population)	Special Concern	Schedule 1	EC
Grizzly Bear	Special Concern	Pending	GN
Wolverine (Western population)	Special Concern	Pending	GN
Horned Grebe (Western population)	Special Concern	Pending	EC
Buff-breasted Sandpiper	Special Concern	Pending	EC
Atlantic Cod, Arctic Lakes	Special Concern	No schedule	Fisheries and Oceans Canada (DFO)
Atlantic Walrus	Special Concern	Pending	DFO
Beluga Whale (Cumberland Sound population)	Threatened	Pending	DFO
Beluga Whale (Eastern Hudson Bay population)	Endangered	Pending	DFO
Beluga Whale (Western Hudson Bay population)	Special Concern	Pending	DFO
Beluga Whale (Eastern High Arctic – Baffin Bay population)	Special Concern	Pending	DFO
Bowhead Whale (Eastern Canada – West Greenland population)	Special Concern	Pending	DFO
Killer Whale (Northwest Atlantic / Eastern Arctic populations)	Special Concern	Pending	DFO
Narwhal	Special Concern	Pending	DFO

[1] The Department of Fisheries and Oceans has responsibility for aquatic species.

[2] Environment Canada (EC) has a national role to play in the conservation and recovery of Species at Risk in Canada, as well as responsibility for management of birds described in the Migratory Birds Convention Act (MBCA). Day-to-day management of terrestrial species not covered in the MBCA is the responsibility of the Territorial Government. Populations that exist in National Parks are also managed under the authority of the Parks Canada Agency.

[3] The *anatum* and *tundrius* subspecies of Peregrine Falcon were reassessed by COSEWIC in 2007 and combined into one subpopulation complex. This subpopulation complex was assessed by COSEWIC as Special Concern, and was added to Schedule 1 of SARA in July 2012.

Appendix C
Archaeological and Palaeontological Resources Terms and Conditions for Land Use Permit Holders

INTRODUCTION

The Department of Culture and Heritage (CH) routinely reviews land use applications sent to the Nunavut Water Board, Nunavut Impact Review Board and the Aboriginal Affairs and Northern Development Canada. These terms and conditions provide general direction to the permittee/proponent regarding the appropriate actions to be taken to ensure the permittee/proponent carries out its role in the protection of Nunavut's archaeological and palaeontological resources.

TERMS AND CONDITIONS

1) The permittee/proponent shall have a professional archaeologist and/or palaeontologist perform the following **Functions** associated with the **Types of Development** listed below or similar development activities:

	Types of Development (See Guidelines below)	**Function** (See Guidelines below)
a)	Large scale prospecting	Archaeological/Palaeontological Overview Assessment
b)	Diamond drilling for exploration or geotechnical purpose or planning of linear disturbances	Archaeological/ Palaeontological Inventory
c)	Construction of linear disturbances, Extractive disturbances, Impounding disturbances and other land disturbance activities	Archaeological/ Palaeontological Inventory or Assessment or Mitigation

Note that the above-mentioned functions require either a Nunavut Archaeologist Permit or a Nunavut Palaeontologist Permit. CH is authorized by way of the *Nunavut and Archaeological and Palaeontological Site Regulations*[3] to issue such permits.

[3] P.C. 2001-1111 14 June, 2001

2) The permittee/proponent shall not operate any vehicle over a known or suspected archaeological or palaeontological site.
3) The permittee/proponent shall not remove, disturb, or displace any archaeological artifact or site, or any fossil or palaeontological site.
4) The permittee/proponent shall immediately contact CH at (867) 934-2046 or (867) 975-5500 should an archaeological site or specimen, or a palaeontological site or fossil, be encountered or disturbed by any land use activity.
5) The permittee/proponent shall immediately cease any activity that disturbs an archaeological or palaeontological site encountered during the course of a land use operation until permitted to proceed with the authorization of CH.
6) The permittee/proponent shall follow the direction of CH in restoring disturbed archaeological or palaeontological sites to an acceptable condition. If these conditions are attached to either a Class A or B Permit under the Territorial Lands Act Aboriginal Affairs and Northern Development Canada directions will also be followed.
7) The permittee/proponent shall provide all information requested by CH concerning all archaeological sites or artifacts and all palaeontological sites and fossils encountered in the course of any land use activity.
8) The permittee/proponent shall make best efforts to ensure that all persons working under its authority are aware of these conditions concerning archaeological sites and artifacts and palaeontological sites and fossils.
9) If a list of recorded archaeological and/or palaeontological sites is provided to the permittee/proponent by CH as part of the review of the land use application the permittee/proponent shall avoid the archaeological and/or palaeontological sites listed.
10) Should a list of recorded sites be provided to the permittee/proponent, the information is provided solely for the purpose of the proponent's land use activities as described in the land use application, and must otherwise be treated confidentially by the proponent.

Legal Framework

As stated in Article 33 of the *Nunavut Land Claims Agreement*:

Where an application is made for a land use permit in the Nunavut Settlement Area, and there are reasonable grounds to believe that there could be sites of archaeological importance on the lands affected, no land use permit shall be issued without written consent of the Designated Agency. Such consent shall not be unreasonably withheld. [33.5.12]

Each land use permit referred to in Section 33.5.12 shall specify the plans and methods of archeological site protection and restoration to be followed by the permit holder, and any other conditions the Designated Agency may deem fit. [33.5.13]

Palaeontology and Archaeology

Under the *Nunavut Act*[4], the federal government can make regulations for the protection, care and preservation of palaeontological and archaeological sites and specimens in Nunavut. Under the *Nunavut Archaeological and Palaeontological Sites Regulations*[5], it is illegal to alter or disturb any palaeontological or archaeological site in Nunavut unless permission is first granted through the permitting process.

Definitions

As defined in the *Nunavut Archaeological and Palaeontological Sites Regulations*, the following definitions apply:

> *"archaeological site" means a place where an archaeological artifact is found.*
>
> *"archaeological artifact" means any tangible evidence of human activity that is more than 50 years old and in respect of which an unbroken chain of possession or regular pattern of usage cannot be demonstrated, and includes a Denesuline archaeological specimen referred to in section 40.4.9 of the Nunavut Land Claims Agreement.*
>
> *"palaeontological site" means a site where a fossil is found.*
>
> *"fossil" includes:*
> *Fossil means the hardened or preserved remains or impression of previously living organisms or vegetation and includes:*
> *(a) natural casts;*
> *(b) preserved tracks, coprolites and plant remains; and*
> *(c) the preserved shells and exoskeletons of invertebrates and the preserved eggs, teeth and bones of vertebrates.*

[4] s. 51(1)
[5] P.C. 2001-1111 14 June, 2001

(**Note:** Partial document only, complete document at: www.ch.gov.nu.ca/en/Archaeology.aspx)

Introduction

The following guidelines have been formulated to ensure that the impacts of proposed developments upon heritage resources are assessed and mitigated before ground surface altering activities occur. Heritage resources are defined as, but not limited to, archaeological and historical sites, burial grounds, palaeontological sites, historic buildings and cairns Effective collaboration between the developer, the Department of Culture, Language, Elders and Youth (CH), and the contract archaeologist(s) will ensure proper preservation of heritage resources in the Nunavut Territory. The roles of each are briefly described.

CH is the Nunavut Government agency which oversees the protection and management of heritage resources in Nunavut, in partnership with land claim authorities, regulatory agencies, and the federal government. Its role in mitigating impacts of developments on heritage resources is as follows: to identify the need for an impact assessment and make recommendations to the appropriate regulatory agency; set the terms of reference for the study depending upon the scope of the development; suggest the names of qualified individuals prepared to undertake the study to the developer; issue an archaeologist or palaeontologist permit authorizing field work; assess the completeness of the study and its recommendations; and ensure that the developer complies with the recommendations.

The primary regulatory agencies that CH provides information and assistance to are the Nunavut Impact Review Board, for development activities proposed for Inuit Owned Lands (as defined in Section 1.1.1 of the Nunavut Land Claims Agreement), and the Aboriginal Affairs and Northern Development Canada, for development activities proposed for federal Crown Lands.

A developer is the initiator of a land use activity. It is the obligation of the developer to ensure that a qualified archaeologist or palaeontologist is hired to perform the required study and that provisions of the contract with the archaeologist or palaeontologist allow permit requirements to be met; i.e. fieldwork, collections management, artifact and specimen conservation, and report preparation. On the recommendation of the contract archaeologist or palaeontologist in the field and the Government of Nunavut, the developer shall implement avoidance or mitigative measures to protect heritage resources or to salvage the information they contain through excavation, analysis, and report writing. The developer assumes all costs associated with the study in its entirety.

Through his or her active participation and supervision of the study, the contract archaeologist or palaeontologist is accountable for the quality of work undertaken and the quality of the report produced. Facilities to conduct fieldwork, analysis, and report preparation should be available to this individual through institutional, agency, or company affiliations. Responsibility for the curation of objects recovered during field work while under study and for documents generated in the course of the study as well as remittance of artifacts, specimens and documents to the repository specified on the permit accrue to the contract archaeologist or palaeontologist. This individual is also bound by the legal requirements of the *Nunavut Archaeological and*

Palaeontological Sites Regulations.

Types of Development

In general, those developments that cause concern for the safety of heritage resources will include one or more of the following kinds of surface disturbances. These categories, in combination, are comprehensive of the major kinds of developments commonly proposed in Nunavut. For any single development proposal, several kinds of these disturbances may be involved

- *Linear disturbances: including the construction of highways, roads, winter roads, transmission lines, and pipelines;*
- *Extractive disturbances: including mining, gravel removal, quarrying, and land filling;*
- *Impoundment disturbances: including dams, reservoirs, and tailings ponds;*
- *Intensive land use disturbances: including industrial, residential, commercial, recreational, and land reclamation work, and use of heritage resources as tourist developments.*
- *Mineral, oil and gas exploration: establishment of camps, temporary airstrips, access routes, well sites, or quarries all have potential for impacting heritage resources*.

Types of Studies Undertaken to Preserve Heritage Resources

Overview: An overview study of heritage resources should be conducted at the same time as the development project is being designed or its feasibility addressed. They usually lack specificity with regard to the exact location(s) and form(s) of impact and involve limited, if any, field surveys. Their main aim is to accumulate, evaluate, and synthesize the existing knowledge of the heritage of the known area of impact. The overview study provides managers with baseline data from which recommendations for future research and forecasts of potential impacts can be made. A Class I Permit is required for this type of study if field surveys are undertaken.

Reconnaissance: This is done to provide a judgmental appraisal of a region sufficient to provide the developer, the consultant, and government managers with recommendations for further development planning. This study may be implemented as a preliminary step to inventory and assessment investigations except in cases where a reconnaissance may indicate a very low or negligible heritage resource potential. Alternately, in the case of small-scale or linear developments, an inventory study may be recommended and obviate the need for a reconnaissance.

The main goal of a reconnaissance study is to provide baseline data for the verification of the presence of potential heritage resources, the determination of impacts to these resources, the generation of terms of reference for further studies and, if required, the advancement of preliminary mitigative and compensatory plans. The results of reconnaissance studies are primarily useful for the selection of alternatives and secondarily as a means of identifying impacts that must be mitigated after the final siting and design of the development project.

Depending on the scope of the study, a Class 1 or Class 2 Permit is required for this type of investigation.

Inventory: A resource inventory is generally conducted at that stage in a project's development at which the geographical area(s) likely to sustain direct, indirect, and perceived impacts can be well defined. This requires systematic and intensive fieldwork to ascertain the effects of all possible and alternate construction components on heritage resources. All heritage sites must be recorded on Government of Nunavut Site Survey forms. Sufficient information must be amassed from field, library and archival components of the study to generate a predictive model of the heritage resource base that will:

- allow the identification of research and conservation opportunities;
- enable the developer to make planning decisions and recognize their likely effects on the known or predicted resources; and
- make the developer aware of the expenditures, which may be required for subsequent studies and mitigation. A Class 1 or 2 permit is required.

Assessment: At this stage, sufficient information concerning the numbers and locations of heritage resources will be available, as well as data to predict the forms and magnitude of impacts. Assessments provide information on the size, volume, complexity and content of a heritage resource, which is used to rank the values of different sites or site types given current archaeological knowledge. As this information will shape subsequent mitigation program(s), great care is necessary during this phase.

Mitigation: This refers to the amelioration of adverse impacts to heritage resources and involves the avoidance of impact through the redesign or relocation of a development or its components; the protection of the resource by constructing physical facilities; or, the scientific investigation and recovery of information from the resource by excavation or other method. The type(s) of appropriate mitigative measures are dictated by their viability in the context of the development project. Mitigation strategies must be developed in consultation with, and approved by, the Department of Culture and Heritage. It is important to note that mitigation activities should be initiated as far in advance of the construction of the development as possible.

Surveillance and monitoring: These may be required as part of the mitigation program.

Surveillance may be conducted during the construction phase of a project to ensure that the developer has complied with the recommendations.

Monitoring involves identification and inspection of residual and long-term impacts of a development (i.e. shoreline stability of a reservoir); or the use of impacts to disclose the presence of heritage resources, for example, the uncovering of buried sites during the construction of a pipeline.

APPENDIX E

Inspection Report

Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

WATER LICENCE INSPECTION FORM

☒ Original
☐ Follow-Up Report

Licensee	Licensee Representative
City of Iqaluit	Paul Clow
Licence No. / Expiry	**Representative's Title**
3AM-IQA0612 (expired)	Project Manager
Land / Other Authorizations	
None	
Date of Inspection	**Inspector**
April 8 2015	Justin HACK

Activities Inspected

☒ Camp/Municipality ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☐ Other: ☐ Other:

Conditions: **A - Acceptable** **C - Concern** **U - Unacceptable** **NA – Not Applicable** **NI – Not Inspected**

Water Use	Condition	Comment	Site Conditions	Condition	Comment	Haz/Mat Management	Condition	Comment
Intake/Screen	C	2	Water Management Structures	C	11	Storage	A	
Flow Measure. Device	A		Culverts / Bridges	A		Spills	C	12
Source:	A		Drainage	A		Spill Plan	A	
Water Use:	C	3,4	Erosion / Sediment	A				
Recirculation (y /n)	NA		Mitigation Measures	A		**Administrative**		
			Reclamation Activities	A		Records	A	
			Materials Storage	A		Reports	A	
Waste Disposal			Signage	A		Plans	A	
Waste Water	A					Notifications	A	
Solid Waste	C	18	**Monitoring**			**Other**		
Hazardous Waste	A		Sample Collection / Analysis	NI				

**The number in the comments field will correspond with specific comments provided below.*

Samples taken by Inspector:	Location(s):
☐ Yes ☒ No	

SECTION 1 ☒ **Comments** ☐ **Non-Compliance with Act or Licence** ☐ **Action Required**

Background

The City of Iqaluit remains in the regulatory process to acquire a new water licence that will authorize the City of Iqaluit to *use* water and deposit wastes to water or wastes that may enter water under the authority of a licence. It is estimated that the new licence will be issued sometime in 2016.

The City of Iqaluit's previous licence has been expired since 2012, but they have been involved in the regulatory process to acquire a new licence since that time.

The City of Iqaluit continues to operate without a licence and has been issued a Letter of Non-Compliance, pursuant to Section 90 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* for contravening Section 11(1), namely using waters for a municipal undertaking without a water use licence as prescribed in Schedule 2 of the *Nunavut Waters Act*.

Inspectors Statement

On April 8 2015, an Inspection was conducted at the City of Iqaluit of all relevant conditions of the expired water licence (3AM-IQA0612). This inspection included all facilities administered by the City of Iqaluit that either *uses* water or deposits waste to water or under conditions in which that waste may enter waters. This included an inspection of the Lake Geraldine Reservoir and the appurtenant infrastructure, the drinking water plant, the sewage lagoon, the waste water processing plant, and the West 40 landfill and related water storage areas. Furthermore, the intent of the inspection was also to identify any other activities that were occurring in the municipality that may trigger section 11 and section 12 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*.

Prior to the inspection, a pre-inspection meeting was held where a brief summary of activities occurring on site were discussed, reminders related to conditions associated with the emergency measures were discussed, and a follow-up on previous commitments and deficiencies as noted in the previous inspection were discussed.

Grab samples were not taken at the waste water outflow from the sewage treatment facility considering no new equipment has been installed and water samples would be in range of the previous inspection results. Furthermore, no grab samples were taken from the water storage ponds at the West 40 Landfill because the City of Iqaluit is not permitted to discharge wastes without the authority of a licence.

SECTION 2	☐ Comments	☐ Non-Compliance with Act or Licence	☒ Action Required

Lake Geraldine Reservoir:

Observations:

1. As noted in the previous inspection, a Dam Safety Inspection was completed on September 22, 2014. This document was submitted to the NWB on December 17, 2014. The Dam Safety Inspection for 2015 has been submitted November 5, 2015.
2. The City of Iqaluit has committed to installing a screen on the water intake pipe at Lake Geraldine in 2016. The city is currently issuing a tender for this work next week.
3. The water line and the heated re-circulation line were inspected between the Dam and the Raw Water Treatment Facility. Approximately half way between both facilities liquid water was observed beside the water lines.

Concerns:

There is concern that there may be a potential leak in the water lines between the Dam and the Water Treatment Facility. It is recommended that the City of Iqaluit follow-up and ensure the water lines are not cracked. The City has conducted a preliminary inspection since the possible leak was discovered. They believe it to be ground water but need to do more work to confirm. Provide a report to the inspector addressing this concern by June 30, 2016.

Drinking Water Treatment Plant:

Observations:

4. Records of water usage were available to the Inspector and up-to-date.
5. Spill kits were noted to be on site.

Concerns:

The City of Iqaluit, pursuant to Section 90 of the NWNSRTA is in non-compliance for contravening Section 11(1), namely using waters for a municipal undertaking without a water use licence as prescribed in Schedule 2 of the *Nunavut Waters Regulations*. This non-compliance is being addressed currently through quarterly progress meetings to ensure any areas of concerns are dealt with in a timely manner.

Waste Water Treatment Plant:

Observations:

6. The Waste Water Treatment Plant continues to operate only as primary treatment. Sludge is collected and placed at the landfill.
7. Waste water is still discharged into the nearshore of Koojessee Inlet.
8. Records were up-to-date and in good order.
9. Spill kits were noted and available throughout the facility.

Sewage Lagoon

Observations:

10. Berms walls surrounding the sewage lagoon showed no signs of slumping or cracking; however, conditions on site prevented a thorough inspection of this structure.
11. Ice was close to overtopping the sewage lagoon.
    a. The City representative outlined that the lagoon was decanted weeks ago after notifying INAC. There is a depression in the middle of the lagoon that may relieve pressure on the walls of the berms surrounding the facility.
    b. It is recommended more sewage is not added to this facility to prevent failure unless freeboard is further addressed.
12. Deposited on the side of the lagoon was snow containing sewage. This pile of snow containing sewage is a product of sewage spill clean-up from around town. It is recommended that this snow containing sewage be pushed further into the lagoon to prevent run-off into the receiving environment.

Concerns:

Storing (waste) water within a facility with insufficient freeboard increases the risk of structural failure. Given the frequency that the lagoon needs to be used, it is recommended that the capacity of the lagoon be increased to deal with the proper treatment of sewage before it is discharged, or standard operating procedures be changed to address this concern.

Furthermore, the sewage resting on the lagoon wall must be placed within the confines of the lagoon. The City has confirmed that this will be actioned.

West 40 Landfill Site

Observations:

13. During the last inspection, a *Landfill Post Fire Restorative Work Plan* was established with the City of Iqaluit as a means to address the restorative work required after the fire at the Landfill to ensure compliance with the Act.
14. The City of Iqaluit is on track to meet all of the commitments established under this plan and will likely implement all measures by the end of 2016.
    a. Please refer to the **West 40 Landfill Post Fire Restorative Work Plan** below on page 3 to see updates

and current status of this plan.

15. Surrounding the West 40 Landfill site exist four water storage facilities for the storage of run-off waste water from the landfill. Two of these facilities are currently being licenced through the regulatory process, whereas the other two were established under the Emergency Measures clause of the NWNSRTA. It is expected the unlicensed water storage facilities will be remediated before October 31, 2016 as understood as part of their emergency measures or the City of Iqaluit will be in contravention of section 11 of the Act, for the use of water without an authorization. Another option it that the City of Iqaluit can apply for an amendment to their water licence before October 31, 2016 to include these storages of water.
16. Due to significant snow cover conditions on the ground, berm integrity and freeboard were not inspected at the four water storage facilities.
17. It was communicated that the City of Iqaluit is prohibited from discharging any of the waste water within these storage facilities to inland waters without the authority of a licence.
    a. Until such a time, the City of Iqaluit outlined during the inspection that they will be treating the waste water to parameters set by Environment Canada and discharging this water to the marine environment.
18. At the north end of the Landfill facility, the City of Iqaluit burns cardboard in a controlled burn box. At the time of the inspection, residual ash from the burn was not being controlled in a way to prevent the waste ash from entering water when freshet is to occur.

***Concerns*:**
Due to the poor ash handling, waste ash handling procedures must be implemented immediately to prevent waste ash from entering water. Otherwise, the City of Iqaluit must request an amendment to their licence to allow for the deposit of waste ash into water.
It is requested that the City of Iqaluit submit a plan to the Inspector by May 13 2016, explaining how they will prevent this waste from entering water or will be subject to further enforcement actions.

West 40 Landfill Post Fire Restorative Work

Background
During the fire extinguishment in 2014, it was explained to the City of Iqaluit that all major water use measures would be temporary in nature and would require work to restore and reclaim the workings to pre-extinguishment status within a reasonable time (which has been set to October 31, 2016). The City of Iqaluit responded post-fire with this work plan outlining the work that would be undertaken to address the restorative work required.

Plan

1. Run-off water collected from the firefighting operations (i.e. water used on the fire) has been transferred from the catchment area to the retention pond across the road and to the new drafting pond adjacent to the landfill entrance; this water will be held in these areas until next summer, when it will be treated and discharged.
    a. *Update: Run-off water from the firefighting operations has been transferred to the new pond and has received primary treatment. In August 2016, the plan is to further treat this water to standards set up Environment and Climate Change Canada for release into marine waters until a water licence is issued.*

2. The household waste that is currently being temporarily stored next to the retention pond will be removed and placed back into the landfill (note: a temperature monitoring program was initiated by the City upon the recommendation of Hellfire Suppression Services to ensure that the “new” waste pile in the landfill was sufficiently cool to accept new waste; this monitoring program is managed by the Acting Director of Emergency and Protective Services; as soon as the temperatures are low enough, the Acting Director will authorize the opening of the “new” waste pile and the waste from the temporary storage site will be transferred back into the landfill).
    a. *Update: The household waste has been removed and placed back within the landfill.*

3. After the household waste has been removed from the temporary storage site, approximately 6-8” of soil will be removed from across the site and deposited in the landfill and the surface grade will be reinstated.
    a. *Update: Soil from underneath the temporary storage area was removed and placed into the landfill. Surface grade was reinstated.*

4. It is expected that there will be some additional run-off water that collects in the catchment area until freeze-up; this run-off water will also be held until next summer when it will be treated and discharged.
    a. *Update: Run-off water has been contained and is currently being held within the old pond. It is scheduled to be treated summer 2016.*

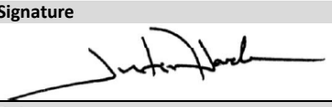
5. A sample of the run-off water that was transferred to the retention pond was procured and analyzed for a suite of parameters including metals, F1-F4 hydrocarbons, BTEX/VOCs, PAHs, Dioxins & Furans, and BOD/TOC, TSS, and nutrients; the results of this sample will support the development of a quote for the treatment of the run-off water.
    a. *Update: The sampling of the run-off water was completed.*

6. The weir that was installed in Carney Creek has been removed and the sediment reinstated at the location where the fire pump was set up to draft fresh water.
    a. *Update: The weir that was installed in Carney Creek was removed and the sediment was reinstated.*

7. Additional water sampling will be completed in the spring of 2015 to assess the run-off water quality within the West 40 Landfill containment areas in order to further optimize the treatment process.
    a. *Update: Completed.*

8. After the water from the new drafting pond has been treated and discharged, the liner will be removed and the grade reinstated.
    a. *Update: Water still remains in the new drafting pond. The City of Iqaluit has confirmed that once discharges from these facilities occur this summer, it can move ahead and remediate the drafting pond.*

9. The plan to address the temporary metals storage site is for the City to issue a tender call in early 2015 for the removal of the material from the site (along with metal waste currently stored at the landfill) and to ship the material to a metals recycling facility in southern Canada. Following the removal of the metal waste, soil samples will be procured and analyzed for a suite of chemical parameters and compared to the analyses that were completed this summer prior to depositing metal waste at the site. If it is determined that any negative impacts occurred to the soil at the site due to the temporary storage of the metal waste, the severity of the impact will be assessed and a remediation program will be initiated if warranted. Water samples will also be procured from the drainage ponds located south of the site that receive run-off from the site. Similarly, these results will be compared to the results of the water analyses that were completed this summer prior to depositing metal waste at the site. If it is determined that any negative impacts occurred to the water in these ponds as a result of the temporary storage of metals at the site, the severity of the impact will be assessed and the water will be diverted to the landfill retention pond for treatment, if warranted.
    a. *Update: The City issued an RFP in March. In the terms of Reference it required the successful proponent to remove metals from inside the landfill by 2016. The metals from the temporary site must be removed by 2017 and if the successful proponents plans on storing these metals in town in 2016/2017, these metals must be removed by 2018.*

Inspector's Name	
Justin Hack	
Signature	
	
Date	
April 26, 2016	

APPENDIX F

Water Licence Application Amendment Summary
(English)

ENGLISH SUMMARY OF AMENDMENT APPLICATION

In December of 2013, the municipal landfill located in the City of Iqaluit, Nunavut caught fire by spontaneous combustion. The local fire department fought the fire and extinguished it, or so they thought. The fire continued smouldering below the surface during the cold winter months. In May, when the snow and ice cover on the waste pile began melting, and oxygen rushed toward the smouldering waste, the fire erupted again. The City lacked the resources and expertise to combat the fire, so it was decided to allow it to burn itself out. However, by August it was obvious that the fire was not going to go out on its own within a reasonable period of time, and a more proactive approach was needed. Experts for extinguishing landfill fires were brought in from Alberta, and on September 1, 2014 they began fighting the fire. By September 16, 2014 the fire had finally been extinguished.

Combatting and extinguishing the fire resulted in the generation of approximately 8 million litres of contaminated water, which was contained within 3 holding basins. Following the extinguishing of the fire, testing of this water in September of 2014 showed that it was contaminated by several different kinds of metals, toxic levels of ammonia nitrogen, BOD[1], as well as elevated levels of suspended solids. In August of 2015, following a competitive proposal process, the City of Iqaluit awarded Qikiqtaaluk Environmental (QE) the contract to treat the contaminated water. At the time the contract was awarded, only 6 weeks remained to order supplies, ship them by marine vessel to Iqaluit and treat the water prior to freeze-up.

The treatment unit used to treat the contaminated water is comprised of 3 steps. The first step involves a pretreatment for metals and suspended solids. The second step is a 2-stage aerated bioreactor to treat first the BOD and then the ammonia nitrogen. Finally the water is pH[2] adjusted, and passed through a 2-stage filter to remove any organic contamination found in the water.

The pretreatment is accomplished by raising the pH to precipitate the metals, and through the addition of polymers to flocculate and separate the suspended solids. This can normally be done in a closed loop; however, this requires treating the water the equivalent of 2 times to ensure that the water has been completely treated. The other preferred option is to treat the water as it is pumped from one basin to another. This is not always possible, such as when the basins are full; in this case the first option is retained.

The bioreactor is installed in a basin with an approximate volume of 4.5 million cubic litres. The pretreatment cannot be done in the bioreactor, as the lime and polymers would have a negative effect on the biological processes required to treat the water.

In the bioreactor a water heater is used to raise the water temperature in the basin to above 15°C. Biological activity doubles for every 10°C increase in temperature, and there is little or no activity between 0 and 10°C. A blower injects air into the water through evenly spaced bubblers that release microbubbles into the water, increasing the available 0_2[3] in the water. Curtains are used to separate the treatment areas with small settling sections between the BOD and ammonia nitrogen treatment areas, and at the end of the bioreactor.

Water samples were collected weekly and sent to a laboratory in Ottawa, so as to follow the progression of the treatment system. Daily on-site measurements were also taken. However, it was found that the on-site measurements for COD[4] and N[5] showed little correlation to the laboratory results.

Target treatment values were determined in cooperation with Environment and Climate Change Canada. The treatment targets are presented in Table 1, following.

1 Biochemical oxygen demand
2 Measure of acidity or alkalinity
3 Oxygen
4 Chemical oxygen demand
5 Nitrogen

TABLE 1
Target Treatment Values

Parameter	Target Value
Total ammonia (NH_3+NH_4^+)	Total ammonia values as presented in the *Canadian Guidelines for the Protection of Aquatic Life – Table 2* (example at pH[1] 7 and 15°C: 7 mg/L)
BOD_5[2]	25 mg/L BOD or levels which are non-acutely toxic
TSS[3]	Lowest possible; suggest 15 to 25 mg/L
pH	6 to 8
Aluminum	No limit established
Arsenic	125 µg/L[4]
Cadmium	1.2 µg/L
Chromium	< 100 µg/L
Copper	4.8 µg/L
Iron	No limit established
Mercury	16 µg/L
Nickel	74 µg/L
Zinc	120 µg/L
Dioxins and furans	39 ppq[5] TEQs[6]
Total Oil and Grease	5 mg/L

1 Measure of acidity or alkalinity
2 Biochemical oxygen demand over 5 days
3 Total suspended solids
4 Micrograms per litre
5 Parts per quadrillion
6 Toxic equivalent

For the water to be considered acceptable for discharge, water samples needed to be sent to a qualified laboratory for toxicity testing with Rainbow Trout. Due to the remote location, this means that samples have to be shipped from Iqaluit to Ottawa, and then forwarded by refrigerated truck to the laboratory in Guelph. Shipping instructions state that the samples are to remain refrigerated at all times.

The treatment system in 2015 (pretreatment only) and 2016 obtained significant levels of contaminant removal; the table below summarizes these results.

Parameter	Average Removal
Total Suspended Solids	**95%**
Arsenic	**92%**
Cadmium	**94%**
Chromium	**97%**
Copper	**92%**
Iron	**99.6%**

Parameter	Average Removal
Nickel	**86%**
Zinc	**99.6%**
Ammonia nitrogen	**65%**
Biochemical Oxygen Demand	**99%**
Oil & Grease	**88%**

All of the work done to treat the water to date has been done under a state of emergency. From this point forward, all operations are subject to normal permitting processes. This is the reason that this amendment application is being submitted.

APPENDIX G

Water Licence Application Amendment Summary
(Inuktitut)

ᐃᓄᒃᑎᑑᖕᒐᔪᑦ ᓇᐃᓈᖅᓯᒪᔪᑦ ᐅᓂᒃᑳᑦ ᐱᔾᔪᑎᓖᑦ ᐋᖅᑭᐊᓇᒍᒪᓂᕐᒧᑦ ᑐᒃᓯᕋᐅᑎᒥᒃ

ᑎᓰᕝᕙ 2013-ᖑᑎᓪᓗᒍ, ᓄᓇᓕᐅᑉ ᒐᕙᒪᖓᑕ ᐊᓯᕕᖓ ᐃᖃᓗᐃᑦ ᓄᓇᓕᐸᐅᔭᖓᓃᑦᑐᖅ ᓄᓇᕗᒥ, ᐃᒻᒥᓂᒃ ᐃᑯᐊᓪᓚᑲᓪᓚᓚᐅᖅᓯᒪᒻᒪᑦ. ᐃᖃᓗᐃᑦ ᖃᑦᑎᕆᔨᖏᓐᓄᑦ ᖃᒥᑦᑕᐅᒐᓱᓚᐅᖅᑐᖅ ᐊᒻᒪᓗ ᖃᒥᑦᑕᐅᓱᕆᔭᐅᓚᐅᖅᑐᓂ. ᑭᓯᐊᓂᓕ ᐃᑭᐊᖓᓂ ᐊᐅᒪᐅᕆᓐᓇᓂᕐᒪᑦ ᐅᑭᐅᒃᑯᑦ ᓂᓪᓚᓱᑦᑐᐊᓘᒐᓗᐊᖅᑎᓪᓗᒍ. ᒪᐃᖑᓕᖅᑎᓪᓗᒍᓕ ᐊᓯᕕᐅᑉ ᖄᖓᓃᑦᑐᖅ ᐊᓂᐅᖅ ᓂᓪᓚᓪᓗ ᐊᐅᑉᐸᓪᓕᐊᓕᕐᒪᑦ, ᐊᒻᒪᓗ ᐊᒻᒪᕆᑎᑐᐊᕐᒪᑦ ᐊᐅᒪᐅᓂᖓᓄᑦ ᓴᓂᖓᒍᑦ, ᐃᑯᐊᓪᓚᑲᓐᓂᓚᐅᖅᓯᒪᒻᒪᑦ. ᑖᒃᑯᐊ ᓄᓇᓕᐸᐅᔮᒃᑯᑦ ᖃᒥᑦᑎᒐᓱᐃᑎᒃᓴᓂᑦ ᐱᓕᕆᔾᔪᑎᒃᓴᑭᓗᐊᓚᐅᕐᒪᑕ ᑕᐃᒪᑦᑐᓕᕆᓂᕐᒥᓪᓗ ᐃᖅᑲᓇᐃᔭᖅᑎᖏᓐᓂᑦ ᖃᐅᔨᒪᔪᕐᑯᑎᖅᑲᓐᖏᓗᐊᖅᑐᑎᒃ, ᐃᓱᒪᑖᓚᐅᖅᓯᒪᔪᑦ ᐃᒻᒥᓂᒃ ᐃᑯᐊᓚᑐᐃᓐᓇᕐᓗᓂ ᓄᖑᑎᐊᖑᔪᒪᓪᓗᓂ. ᑭᓯᐊᓂᓕ ᐋᓪᓕᓯᐅᓕᖅᑎᓪᓗᒍ ᓇᓗᓇᐃᖅᓂᓚᐅᖅᑐᖅ ᑕᐃᓐᓇ ᐃᑯᐊᓚᖓ ᒫᓐᓇᒃᑯᑦ ᐃᒻᒥᓂᒃ ᖃᒥᔾᔪᖕᒥᒻᒪᑦ, ᑕᐃᒫᓪᓗ ᐱᓕᕆᐊᖑᓗᓂ ᑭᓯᐊᓂᐅᓕᔪᓪᓗᓂ. ᖃᐅᔨᒪᔪᕐᔪᐊᖅ ᖃᒥᑦᑎᓂᕐᒥᒃ ᐊᓯᕕᓐᓂᒃ ᑎᑭᑎᑕᐅᓚᐅᖅᑐᑦ ᐋᓪᔫᑕᒥᑦ, ᐊᒻᒪᓗ ᔩᑏᕝᕙ 1, 2014-ᒥ ᖃᒥᑦᑎᒐᓱᐊᓕᓚᐅᖅᓯᒪᓪᓗᑎᒃ. ᔩᑏᕝᕙ 16, 2014-ᖑᓕᖅᑎᓪᓗᒍ ᖃᒥᑕᐅᓯᓐᓇᓕᖅᑐᒥᓂᖅ.

ᖃᒥᑦᑎᐅᓱᐊᖅᑐᑎᒃ ᐃᑯᐊᓚᔪᒥᒃ ᓴᖅᐲᓕᕿᓚᐅᖅᑐᑦ ᑕᒫᓂᐸᓗᒃ 8 ᒥᓕᐊᓐ ᖃᓪᓗᓇᓂᒃ (ᑖᓚᓂᑦ) ᓱᕋᖅᓯᒪᔪᒥᒃ ᐃᒥᕐᒥᒃ, ᓄᐊᑦᑕᐅᔪᔪᓂᒃ ᐱᖓᓱᓄᑦ ᐃᒻᒪᑦᑕᖅᑐᓄᑦ ᓄᓇᒥ ᓴᓇᓯᒪᔪᓄᑦ. ᖃᒥᑦᑕᓚᐅᖅᑎᓪᓗᒍᓕ ᐃᑯᐊᓚᔪᖅ, ᔫᓯᕙᒥ ᑕᐃᒃᑯᐊ ᐃᒦᑦ ᓄᐊᑦᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᒪᓪᓚᑦ ᖃᐅᔨᔭᐅᔫᒪᓪᓚᑦ ᓱᕋᖅᓯᒪᔪᖅ ᐊᒥᓱᐊᓗᓐᓄᑦ ᐊᔾᔨᒌᓐᖏᑦᑐᓄᑦ ᓴᕕᕋᔭᒥᓂᕐᓄᑦ, ᓴᓐᖏᓂᖏᑦ ᑐᕐᑯᓇᖅᓯᓯᒪᔪᑦ ᓱᕕᓐᓂᑦᑐᖅ ᓱᕋᔪᒃ, ᓂᕿᒥᓂᕈᓃᔭᐃᑦ, ᐊᒻᒪᓗᑦᑕᐅᖅ ᐊᒥᓱᒪᓇᓐᓂᑦ ᐳᑦᑕᔪᓂᒃ ᐃᑭᐊᖅᓯᐅᖅᑐᓂᓪᓗ ᑎᓯᕖᑎᓂᒃ ᓴᓂᕋᖏᓂᒃ. ᐋᒡᒌᓯ 2015-ᒥ, ᑳᓐᑐᕌ ᐊᑭᑦᑐᕋᕈᑎᐅᓚᐅᖅᑐᓂ, ᐃᖃᓗᐃᑦ ᓄᓇᓕᐸᐅᔭᖓ ᑳᓐᑐᕌᒥᒃ ᑐᓂᓯᓚᐅᖅᑐᖅ ᕿᑭᖅᑖᓗᒃ ᐊᕙᑎᓕᓇᔾᔨᕆᓐᓇᓄᑦ ᓴᓗᒻᒪᖅᓴᐃᓂᐊᕐᓗᑎᒃ ᓱᕋᖅᓯᒪᔪᒥᒃ ᐃᒪᕐᒥᒃ. ᑕᐃᒃᓯᒪᓂ ᑳᓐᑐᕌ ᑐᓂᔭᐅᒻᒪᑦ, 6-ᑐᐃᓐᓇᕐᓂᒃ ᐱᓇᓱᐊᕈᓯᕐᓂᒃ ᐱᕕᖃᓚᐅᕐᒪᑕ ᑎᑭᓴᐃᕆᐊᖃᖅᑐᑎᒃ ᓱᓇᒃᑯᑖᓂᒃ, ᐅᒥᐊᕐᔪᐊᒃᑯᑦ ᑎᑭᑎᑦᑎᕆᐊᖃᖅᑐᑎᒃ ᐃᖃᓗᓐᓄᑦ, ᐊᒻᒪᓗ ᐃᒥᕐᒥᒃ ᓴᓗᒻᒪᒃᓴᐃᕆᐊᖃᖅᑐᑎᒃ ᓯᑯᓚᐅᓐᖏᓐᓂᖓᓂ.

ᐃᒥᕐᒥᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎ ᐱᖓᓲᓕᖅᑲᖓᔪᒥᒃ ᓴᓗᒻᒪᖅᓴᐃᕙᓪᓕᐊᔫᖑᔭᖅ. ᓯᕗᓪᓕᖅᐸᖅ ᓴᓗᒻᒪᖅᓴᐃᕆᐊᓐᖓᖅᑐᖅ ᓴᕕᕋᔭᓐᓂᒃ ᐳᑦᑕᔪᓂᓪᓗ ᑎᓯᔪᓂᒃ ᓴᓂᓐᓂᒃ. ᑐᖏᓕᐊ ᒪᕿᑦᓕᖅᑲᖓᔪᖅ ᐳᓪᓚᖃᖅᑐᒥ ᖁᐱᕈᕋᑖᓄᑦ ᓴᓗᒻᒪᒃᓴᐃᖅᑳᔫᖅ ᓂᕿᒥᓂᕐᓂᒃ ᐊᒻᒪᓗ ᑭᖑᓂᐊᒍᑦ ᓱᕕᓐᓂᑦᑐᓂᒃ ᓱᕋᔪᓂᑦ. ᐊᒻᒪᓗ ᐱᖓᔪᐊᓂ ᐱᓕᕆᐊᖑᓂᖓ ᑕᒪᑐᒪ ᐃᒥᐅᑉ ᐅᕕᓂᒥᒃ ᐆᑦᑎᑦᑎᔪᓐᓇᕐᓂᖓ ᒥᑭᓪᓕᕆᐊᖅᑕᐅᔫᖅ, ᐊᒻᒪᓗ ᐃᓗᐊᒎᖅᑎᑕᐅᓪᓗᓂ ᒪᕿᑦᓕᖅᑲᖓᔪᒃᑯᑦ ᓴᓂᐅᔾᔭᐃᒃᑯᑎᒃᑯᑦ ᖁᐱᕈᒥᓃᔭᖅᑕᐅᓪᓗᓂ.

ᑕᒪᓇ ᓱᕗᓂᐊᓂ ᓴᓗᒻᒪᖅᑕᐅᕆᐊᓐᖑᕐᓂᖓ ᐱᓕᕆᐊᖑᔫᖅ ᖁᕝᕙᔾᔭᕆᐊᖅᑕᐅᓪᓗᓂ ᓄᖑᓴᐃᔭᓐᓇᕐᓂᖓ ᓴᕕᕋᔭᐅᓂᖓ ᑭᕙᔪᓐᓇᖅᓯᓂᐊᕐᒪᑦ ᐊᒻᒪᓗ ᐃᓚᐅᖅᑕᐅᓪᓗᑎᒃ ᑲᑎᑉᐸᓪᓕᐊᓇᖅᑐᓂᒃ ᐃᓛᒃᑯᑦ ᓄᐊᑦᓴᐅᓂᐊᕐᒪᑕ ᓴᓃᑦ. ᑕᒪᓇ ᐱᓕᕆᐊᖑᔫᖑᓗᐊᖅ ᐊᒻᒪᓗᕿᑕᐅᔨᖓᔪᒃᑯᑦ ᒪᑐᓯᒪᔪᒃᑯᑦ, ᑭᓯᐊᓂᓕ ᑕᐃᒪᐃᓐᓂᐊᖅᑲᑕ ᐃᒥᖅ ᓴᓗᒻᒪᓴᖅᑕᐅᔭᕆᐊᖅᑲᖅᓴᔭᐅᖅᑐᖅ ᒪᕿᐊᖅᑎᖅᑐᓂ ᖃᐅᔨᒪᔭᐅᑦᑎᐊᖅᓱᐊᖅᓱᐊᖅᑐᓂ ᓴᓗᒻᒪᑦᑎᐊᖅᓱᐊᖅᓯᒪᖕᖔᖅ. ᐊᐃᑉᐹ ᐊᑐᖅᑕᐅᓴᓪᓕᒥᔪᖅ ᑕᒪᓇᐅᒻᒪᑦ ᐃᒥᕐᒥᒃ ᓴᓗᒻᒪᒃᓴᐃᓂᖅ ᒥᓪᓗᐊᖅᑕᐅᕙᓪᓕᐊᑎᓪᓗᒍ ᐊᑕᐅᑦᑎᒥᒃ ᐃᒻᒪᒃᓯᒪᔪᒥᒃ ᐊᓯᐊᓄᑦ ᐃᒥᒃᑯᕕᒻᒧᑦ. ᑖᓇ ᑭᓯᐊᓂ ᐊᑐᐃᓐᓇᖅᓴᒃᓴᐅᕆᑦᑐᖅ, ᑕᐃᒫᖕᒋᑖᒃ ᑯᕕᕕᐅᖅᑲᑦᑕᔩᑦ ᑕᑦᑎᓪᓗᒋᑦ; ᑕᐃᒪᓕ ᓱᕗᓪᓕᖅ ᐅᖅᑲᐅᓯᐅᖅᑳᖅᑐᖅ ᐊᑐᖅᑕᐅᖕᖔᓇᐊᖅᑲᖅᓴᖅᐳᖅ.

ᑖᓇ ᖁᐱᕈᕋᓐᓄᑦ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎ ᐋᖅᑭᒃᓯᒪᔪᖅ ᐃᒥᒃᑯᕕᒻᒥ ᐃᒪᖅᑲᕈᓇᖅᑐᒥ ᑕᒫᓂᐸᓗᒃ 4.5 ᒥᓕᐊᓐ ᖃᓪᓗᓈᑦ. ᑕᐃᓇ ᓱᕗᓕᕐᒥ ᓴᓗᒻᒪᖅᓴᐃᕆᐊᖓᖑᕈᑎ ᐊᑐᖅᑕᐅᔪᓐᓇᖕᖏᑦᑐᖅ ᖁᐱᕈᕋᓐᓄᑦ ᓴᓗᒻᒪᖅᓴᐃᕕᒻᒥ, ᐱᔾᔪᑎᒋᓪᓗᒍ ᓄᖑᓐᓇᖅᑐᖅ ᐊᒻᒪᓗ ᓂᐱᓴᐅᑎᑦ ᖁᐱᕈᕋᓐᓄᑦ ᐃᒥᕐᒥᒃ ᓴᓗᒻᒪᒃᓴᐃᔾᔪᑎᐅᔪᓄᑦ ᐱᐅᓯᔭᖕᖏᒻᒪᑎᒃ

ᖁᐱᕈᕋᓐᓄᑦ ᓴᓗᒻᒪᓴᐃᔾᔪᑎᒥ ᐃᒥᕐᒧᑦ ᐆᓇᖅᓯᓴᐅᑎᒥᒃ ᐊᑐᓲᑦ ᐃᒪᖅ ᐆᓇᕐᓂᖅᑲᓕᖅᑎᑕᐅᓪᓗᓂ 15°C-ᒥᒃ. ᖁᐱᕈᕋᓐᓇᖅ ᑕᐃᒪᓐᓇᓪᓗᐊᖅ ᐊᒥᓲᓂᖕᒋᓐᓇᓂᑦ ᐊᒥᓱᕋᖅᐹᓪᓕᖅᑕᕐᓚᑦ 10°C–ᒥᑦ ᐆᓇᖅᓯᕖᓪᓕᓂᖅᑕᒫᖅ, ᐊᒻᒪᓗ ᖁᐱᕈᑦ ᐊᐅᓚᒐᓵᑐᐃᓐᓇᓲᖑᒻᒪᑦ ᐊᐅᓚᓲᖑᓐᖏᓪᓕᒪᓇᑦᑐᑎᓪᓗ ᐆᓇᕐᓂᖅᑲᖅᑎᓪᓗᒍ 0–ᒥᑦ – 10°C ᐊᑯᓐᓂᖓᓂ. ᐳᓪᓚᒨᖅᑐᖅ ᓱᐱᓯᕙᑦᑐᓂ ᐃᒪᕐᒧᑦ ᓲᐳᖅᕕᖕᒋᑎᒍᑦ ᐊᔾᔨᒌᒥᒃ ᖃᓂᒌᓐᓂᖅᑲᖅᑐᓄᑦ ᐃᒪᕐᒧᑦ ᐳᕐᓇᓪᓛᑎᑦᑎᓲᖅ, ᐊᓂᕐᓂᖅᑲᕐᓇᕐᓂᖓᓂᒃ ᐃᓚᐅᓇᓪᓗᓂ. ᑕᓗᐊᕐᓄᑦ ᐃᓛᒃᑰᖓᑎᑕᐅᓲᑦ ᓴᓗᒻᒪᖅᑕᐅᔪᑦ ᒥᑭᔩᑎᓂᒃ ᑐᑦᑕᖅᕕᖅᑲᖅᑐᑎᒃ ᑭᕕᐅᕋᖅᑐᓄᑦ ᐊᑯᓐᓂᖓᓂ ᓂᕿᒥᓂᕐᓂᒃ ᐊᒻ ᓱᕕᓐᓂᑦᑐᓂᒃ ᓱᕋᔪᓂᒃ ᓴᓗᒻᒪᖅᓴᐃᕕᖓᓂ, ᐊᒻᒪᓗ ᐃᓱᕆᔭᖓᓂ ᖁᐱᕈᕋᓐᓄᑦ ᓴᓗᒻᒪᖅᓴᐃᕕᐅᑉ.

ᐃᒦᑦ ᖃᐅᔨᓴᖅᓴᒃᓴᐃᑦ ᖃᓗᔭᐅᕙᓚᐅᖅᑐᑦ ᐱᓇᓱᐊᕈᓯᖅᑕᒫᖅ ᐋᑐᕚᒥ ᖃᐅᔨᓴᖅᕕᒻᒧᓪᓗ ᐊᐅᓪᓚᖅᑎᑕᐅᕙᑦᑐᑎᒃ, ᖃᐅᔨᒪᔭᐅᔭᓇᓂᐊᕐᒪᑦ ᓴᓗᒪᐸᓪᓕᐊᓂᖅ. ᖃᐅᑕᒫᑦ ᓱᕋᔪᓄᑦ ᖃᐅᔨᓴᐅᑎᓄᑦ ᖃᐅᔨᓴᖅᐸᓚᐅᕐᒥᔪᑦ. ᑭᓯᐊᓂᓕ ᖃᐅᔨᓴᔭᐅᓚᐅᖅᑐᖅ ᑕᐃᒃᑯᐊ ᓴᓗᒻᒪᖅᓴᐃᕕᐅᔪᒥ ᖃᐅᔨᓴᐅᑎᓄᑦ ᖃᐅᔨᓴᔭᐅᔪᑦ ᐊᔾᔨᖅᑎᐊᖅᐸᓚᐅᖕᖏᒻᒪᑕ ᖃᐅᔨᓴᖅᕕᒻᒥ ᖃᐅᔨᒪᔾᔨᒥᐅᔪᓂᒃ.

ᓴᓗᒻᒪᖅᓴᐃᓂᖏᑦ ᑐᕋᒐᓇᔭᐅᓂᐊᖅᑐᑦ ᐋᖅᑭᑦᑕᐅᔪᔪᑦ ᐱᓕᕆᖅᑎᖅᑲᖅᑐᑎᒃ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᓯᓚᐅᑉ ᐊᓯᔾᔨᐸᓪᓕᐊᓂᖓᓄᑦ ᐱᓕᕆᕕᖓᓂᒃ ᑲᓇᑕᒥ. ᑎᑭᐅᑎᔭᐅᓯᒪᔪᐊᖅᑐᑦ ᓴᓗᒪᓂᕐᒧᑦ ᓇᓗᓇᐃᖅᑐᐃᔾᔪᑎ 1–ᒥ ᑕᑯᒃᓴᐅᕗᑦ, ᐆᒪ ᐅᖓᑎᑦᑎᐊᖓᓂ.

ᓇᓗᓇᐃᖅᑐᐃᕝᔪᑎ 1

ᓴᓗᒻᒪᒃᓴᐃᓂᕐᒧᑦ ᑎᑭᐅᑎᔭᐅᒐᓱᐊᖅᑐᑦ ᓈᓴᐅᑎᖏᑦ

ᑭᓱᓂᖓ	**ᓴᓗᒪᓂᕐᒧᑦ ᑎᑭᐅᑎᔭᐅᒐᓱᐊᖅᑐᖅ**
ᑲᑎᑦᑐᑎᒃ ᓱᕕᓐᓂᑦᑐᑦ ᓱᑭᔪᐃᑦ	ᑲᑎᑦᑐᕆᑦ ᓱᕕᓐᓂᑦᑐᐃᑦ ᓈᓴᐅᑎᖏᑦ ᒪᓕᑦᑐᑦ *ᑲᓇᑕᒥ ᐊᑐᐊᒐᐅᔪᓂᑦ ᓴᐳᒻᒍᑎᐅᔪᓂᒃ ᐃᒪᕐᒥᐅᑕᓂᒃ ᐆᒪᔪᓂᒃ* – *ᓇᓗᓇᐃᖅᑐᐃᒍᑎ 2* (ᐆᑦᑑᑎᐅᔪᖅ ᑕᒫᓂᑦᑐᖅ ᓄᖑᓴᐃᔪᓇᕐᓂᖓ 7–ᒥᑦ 15°C–ᒧᑦ: 7 ᐆᑑᑎᕋᓛᑦ/ᖃᓪᓗᑎᒥ)
ᓂᕿᒥᓃᑦ	25 ᐆᑑᑎᕋᓛᑦ/ᖃᓪᓗᑎᒥ ᓂᕿᒥᓃᑦ ᐅᕙᓘᓐᓃᑦ ᖁᑦᑎᓐᓂᓖᑦ ᑐᖁᓇᖅᓯᓯᒪᙱᑦᑐᓂᑦ
ᑲᑎᑦᑐᕆᑦ ᐃᑭᐊᖅᓯᐅᖅᑐᑦ ᓴᓃᑦ	ᐊᑦᑎᓂᖅᐹᖑᔪᓇᖅᑐᖅ; ᑕᐃᒪᐃᖁᔭᖅ 15--ᒥᑦ 25–ᒧᑦ ᐆᑑᑎᕋᓛᑦ/ᖃᓪᓗᑎᒥ
ᓄᖑᓴᐃᓂᖓ	6–ᒥᑦ 8–ᒧᑦ
ᓴᕕᕋᔭᒃ ᐅᑭᑦᑐᐊᕿᔾᔭᒃ	ᐃᓱᖓ ᐋᖅᑭᑦᑕᐅᓯᒪᙱᑦᑐᖅ
ᑐᖁᓇᖅᑐᓪᓚᑦᑖᖅ	125 μg/L[4]
ᓄᖑᔪᐃᑦᑐᒃᓴᖅ	1.2 μg/L
ᕿᕐᓚᑦᑐᖅ ᓴᕕᕋᔭᒻᒧᑦ ᐊᒥᐊᖅ	< 100 μg/L
ᓴᕕᒐᐅᔭᒃᓴᔭ	4.8 μg/L
ᓴᕕᕋᔭᑐᐃᓐᓇᒃᓴᔭ	ᐃᓱᖓ ᐋᖅᑭᒃᓯᒪᙱᑦᑐᖅ
ᓴᕕᕋᔭ ᓂᓪᓚᓇᖅᑐᓂ ᑰᓰᖅ	16 μg/L
ᐸᐃᓴᔅᓴᖅ	74 μg/L
ᓴᕕᕋᔭᒻᒧᑦ ᑎᓯᑦᑎᓴᐅᑎ	120 μg/L
ᓂᕐᔪᑎᓅᖅᑲᓰᑦ	39 ppq[5] ᑐᕐᑯᓇᖅᑐᓂᒃ ᐊᔾᔨᖃᕐᓂᖓ
ᑲᑎᑦᑐᕆᑦ ᐅᖅᓱᖅᑎᕈᑎᑦ ᐱᐊᒃᓴᐅᑏᓪᓗ	5 mg/L

1 ᐆᑦᑐᖅᑕᐅᓂᖓ ᓄᖑᓴᐃᔪᓇᕐᓂᖓᓂᒃ ᐅᕙᓘᓐᓃᑦ ᓄᖑᓴᐃᔪᓇᕐᓂᖓᓂᒃ ᐀ᐱᔭᐃᓰᓂᒃ
2 ᖁᐱᕐᕈᕋᓛᑦ ᐊᓂᕐᓂᕐᑲᓇᐊᕐᑲᕐᓂᕆᑦ ᐅᓪᓗᓄᑦ ᑕᓪᓚᒪᓄᑦ
3 ᑲᑎᑦᑐᕆᑦ ᐃᑭᐊᖅᓯᐅᖅᑐᑦ ᐳᑦᑕᔪᓪᓗ ᑎᓯᔪᑦ ᓴᓃᑦ
4 ᐆᑦᑑᑎᑎᒍᑦ ᓱᕈᔪᕐᑲᕐᓂᖓ ᐊᑕᐅᓯᖅ ᖃᓪᓗᑎ
5 ᐊᑕᐅᓯᒐᓛᒃ, ᐅᕙᓐᖓᓐ ᓈᓴᐅᑎᒥᒃ: 1,000,000,000,000,000
6 ᑐᕐᑯᓇᖅᑐᒥᒃ ᐊᔾᔨᖃᕐᓂᖓ

ᑕᐃᒪᓕ ᐃᒥᖅ ᓈᒻᒪᕆᔭᐅᓕᕐᓂᐊᖅᐸᑦ ᐃᒪᕕᒻᒧᑦ ᑯᕕᑎᒐᒃᓴᕈᕐᓗᓂ, ᐃᒦᑦ ᖃᐅᔨᓴᕋᒃᓴᐃᑦ ᐊᐅᓪᓚᖅᑎᑕᐅᔭᕆᐊᓖᑦ ᐃᓚᑕᕆᔭᐅᓯᒪᔪᒧᑦ ᖃᐅᔨᓴᖅᕕᒻᒧᖅ ᑐᕐᑯᓇᕐᓂᖏᑦ ᖃᐅᔨᓴᖅᑕᐅᒐᔭᕐᒪᑕ ᐃᖃᓗᓪᓚᕆᓐᓄᑦ ᐆᒪᔪᓄᑦ. ᐅᖓᓯᑦᑐᒦᓐᓂᖓ ᖃᐅᔨᓴᖅᕕᒻᒥᒃ ᐱᕝᔪᑎᕆᓪᓗᒍ, ᖃᐅᔨᓴᕋᒃᓴᐃᑦ ᐊᐅᓪᓚᖅᑎᑕᐅᖃᑦᑕᕆᐊᓖᑦ ᐃᖃᓗᓐᓂᑦ ᐋᑐᕚᒧᑦ, ᐊᒻᒪᓗ ᓄᓇᓯᐅᑎᒃᑯᑦ ᓂᓪᓚᓇᖅᑐᖃᐅᑎᓚᒃᑯᑦ ᐅᓯᔭᐅᓚᕐᒥᓗᑎᒃ ᖃᐅᔨᓴᖅᕕᒻᒧᑦ ᒍᕘᐊᕝᒥ. ᐊᐅᓪᓚᕈᑎᖓᑦ ᑎᑎᖅᑲᖅ ᐅᖃᖅᓯᒪᕙᑦᑐᑦ ᑖᒃᑯᐊ ᖃᐅᔨᓴᕋᒃᓴᐃᑦ ᓂᓪᓚᓇᖅᑐᒃᑯᕕᒦᕆᓐᓇᓇᐊᖃᕐᒪᑕ ᖃᖓᓚᒫᒃᑯᑦ.

ᑖᓐᓇ ᓴᓗᒻᒪᓴᐃᔾᔪᑎ ᐊᑐᖅᑕᖅ 2015–ᒥ (ᓯᕗᓂᐊᒍᑦ ᓴᓗᒻᒪᒃᓴᐃᓂᑐᐊᖅ) ᐊᒻᒪᓗ 2016–ᒥ ᐊᕆᔪᑲᓪᓛᓗᓐᓂᒃ ᓱᕈᔪᓂᒃ ᐀ᐱᔭᐃᔾᔨᑎᑦᑎᓚᐅᖅᑐᑦ: ᐅᕙ ᐊᑖᓃᑦᑐᑦ ᓇᓗᓇᐃᖅᑐᐃᔾᔪᑏᑦ ᑕᒪᑐᒥᖓ ᑕᑯᒃᓴᐅᑎᑦᑎᕗᑦ.

ᑭᓱᓂᖓ	**᐀ᐱᔭᖅᑕᑦ**
ᑲᑎᑦᑐᕆᑦ ᐳᑦᑕᔪᑦ ᐃᑭᐊᖅᓯᐅᑐᓪᓗ ᓴᓃᑦ	**95%**
ᑐᕐᑯᓇᖅᑐᖅ	**92%**
ᓄᖑᔪᐃᑦᑐᒃᓴᖅ	**94%**
ᕿᕐᓚᑦᑐᖅ ᓴᕕᕋᔭᒻᒧᑦ ᐊᒥᐊᖅ	**97%**
ᓴᕕᒐᐅᔭᒃᓴᔭ ᓴᕕᕋᔭᒃ	**92%**
ᓴᕕᕋᔭᑐᐃᓐᓇᒃᓴᔭ	**99.6%**

ᑭᓱᓂᖓ	**᐀ᐱᔭᖅᑕᑦ**
ᐸᐃᓴᔅᓴᖅ	**86%**
ᓴᕕᕋᔭᒻᒧᑦ ᑎᓯᑦᑎᓴᐅᑎZinc	**99.6%**
ᐳᕕᓐᓂᑦᑐᖅ ᓱᕈᔪ	**65%**
ᖁᐱᕐᕈᕋᓛᑦ ᐊᓂᕐᓂᕐᑲᕐᓇᖅᑐᒥᒃ ᐱᕆᐊᕐᑲᕐᓂᖓ	**99%**
ᐅᖅᓱᖅᑎᕈᑎᑦ ᐱᐊᒃᓴᐅᑎᓪᓗ	**88%**

ᐊᑕᕆᖅᑐᑎᒃ ᐃᓕᓐᓂᐅᓯᒪᔪᑦ ᐃᒥᕐᒥᒃ ᓴᓗᒻᒪᖅᓴᐃᓪᓗᑎᒃ ᐱᓕᓐᐊᕁᔪᓯᒪᕗᑦ ᑐᐊᕕᕐᓇᑐᒦᓚᕐᓂᒃᑯᑦ. ᑕᕝᕙᓐᖓᑦ ᐱᕆᐊᕐᓗᓂ ᓯᕗᒧᑦ, ᐊᐅᓚᑦᑎᓂᓕᒫᑦ ᒪᓕᒋᐊᕐᑲᕐᓂᐊᓕᕐᒪᑕ ᐊᑐᖅᑕᐅᕙᑦᑐᓂᒃ ᐱᔪᓐᓇᐅᑎᑖᓇᐊᕐᑲᕐᓂᕐᓂᒃ. ᑕᕙ ᑖᓐᓇ ᐱᕝᔪᑎᐅᓪᓗᓂ ᐋᖅᑭᐊᓇᔪᑎᒥᒃ ᑐᒃᓯᕋᐅᑎᒥᒃ ᑐᓂᓯᕗᑦ.

APPENDIX H

Spill Contingency Plan

SPILL CONTINGENCY PLAN

CITY OF IQALUIT LANDFILL WATER TREATMENT PROGRAM

IQALUIT, NUNAVUT

REVISION 0

Iqaluit
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24-Hour Non-Emergency Dispatch: 867 979-5650

Operations Superintendent: 867 222-2956

November 30, 2016

O/Ref. No.: QE15-107-5

Confidential and priviledged document

Qikiqtaaluk environmental
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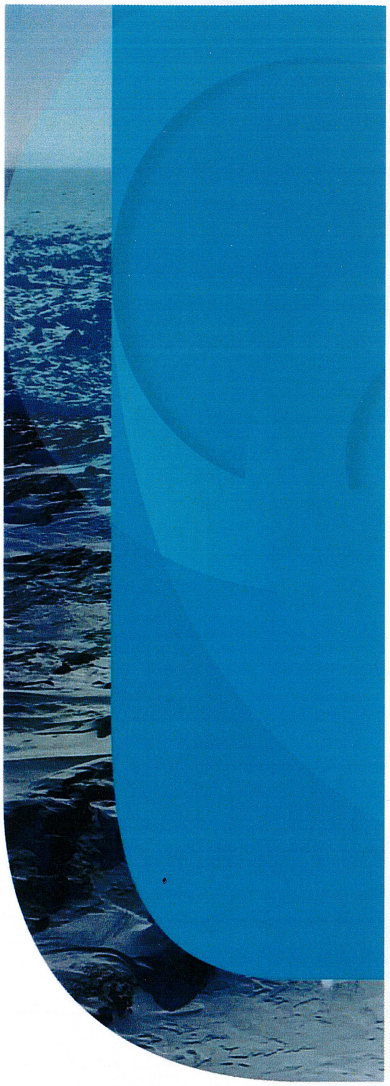
Spill Contingency Plan

City of Iqaluit Landfill
Water Treatment Program

Iqaluit, Nunavut

REVISION 0



Privileged and confidential document presented to

CITY OF IQALUIT

Prepared and verified by:

Greg Johnson, P.Eng., M.Sc.A.
Project Director – Northern Projects

Approved by:

Benoît Dion, B.Sc., M.Env.
Director – Northern Projects

Qikiqtaaluk environmental
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November 25, 2016

O/Ref. No.: QE15-107-5

PREAMBLE

This Emergency and Spill Response Plan covers the works that are related to the treatment of contaminated landfill contact water.

The Plan will be updated and revised as necessary if operations are modified or if type and quantity of waste stored changes.

Formal distribution of the Plan has been made to:

Aboriginal Affairs and Northern Development Canada - Nunavut Field Operations
969 QIMUGJUK BUILDING
PO BOX 2200
IQALUIT (Nunavut) X0A 0H0
Fax: 867 979-6445

Additional copies and updates of this Plan may be obtained from:

City of Iqaluit
Att.: Matthew Hamp
PO Box 460
Iqaluit, Nunavut
X0A 0H0
Phone: (867) 979-5600

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1. GENERAL

The Spill Contingency Plan (Plan) was developed to assist with implementing measures to protect the environment and minimize impacts from spill events. It provides precise instructions to guide all personnel in emergency spill response situations. The Plan outlines procedures for responding to spills, while minimizing potential health and safety hazards, environmental damage, and clean-up costs.

This Emergency and Spill Response Plan covers the work related to the treatment of contaminated landfill contact water.

The activities listed in this Plan will be located near the City of Iqaluit Landfill (hereinafter referred to as the "Site"). The following table presents the approximate location of the water treatment activities:

TABLE 1
Approximate Location of Area Impacted by the Airport Project

Coordinate	Latitude	Longitude	Description
1	63°44'0.0"	68°31'40.0"	Northeastern Corner of Site
2	63°44'0.0"	68°32'15.0	Northwestern Corner of Site
3	63°43'42.0	68°32'15.0	Southwestern Corner of Site
4	63°43'42.0	68°31'40.0	Southeastern Corner of Site

The site is bordered by Koojesse Inlet to the east of the site, Frobisher Bay to the south, and the outlet of the Sylvia Grinnell River to the west of the site. The approved discharge location is into Koojesse Inlet, and the drainage from the Site runs toward the south, into Frobisher Bay.

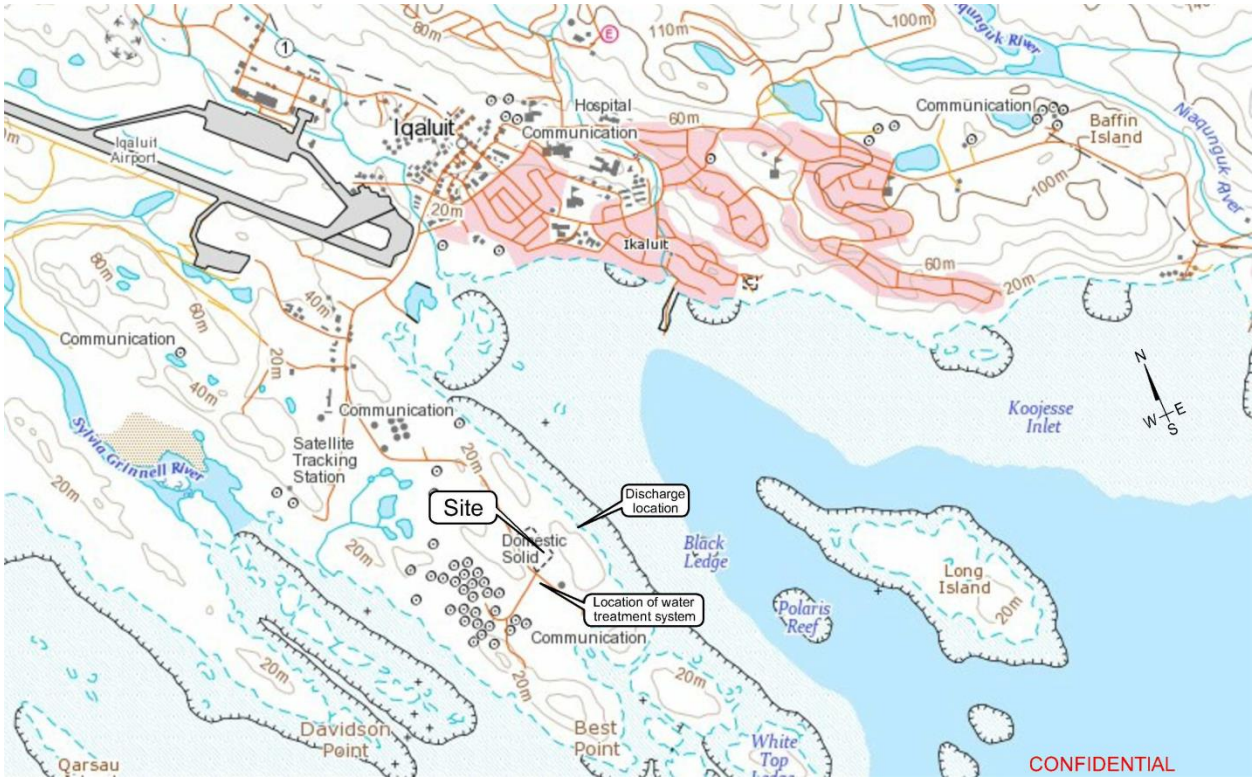

FIGURE 1: Site Plan Showing Locations of Site Works
Source: Google Maps, 2015

The Plan will be implemented to ensure that the storage and treatment of contaminated water respects all applicable federal and territorial laws, regulations and requirements. The City of Iqaluit will obtain, and comply with, all required permits, approvals and authorizations required for the operations. The following applicable Regulations and documents constitute an integral part of the Spill Contingency Plan:

- The *Canadian Environmental Protection Act* controls hazardous substances from their production and/or import, their consumption, storage and/or disposal;
- The federal *Transportation of Dangerous Goods Act* and *Regulations* ensure the protection of public health and safety, and the environment during the handling and transport of dangerous goods. The Regulations apply to all modes of transportation, by road, by sea, and by air;
- The *Nunavut Environmental Protection Act* governs the protection of the environment from contaminants. The act defines offences and penalties as well as the powers of government inspectors;
- The *Nunavut Spill Contingency Planning and Reporting Regulations* describe requirements for spill reporting and emergency planning;
- The *Land Transportation Emergency Response Guideline for Petroleum Spills* developed by the Canadian Petroleum Products Institute outlines scope, emergency response code of practice, response time guidelines, response equipment and personnel capability requirements;

2. STORAGE OF CONTAMINATED WATER

As part of the spill emergency response plan, the City of Iqaluit is responsible for implementing, through the subcontractor responsible for the treatment of contaminated water at the landfill, the following procedures:

Contaminated water will be stored on-site in holding basins with the following maximum volumes:

- Leachate Containment Pond – 4,000,000 L;
- Retention Pond – 3,500,000 L;
- Bioreactor – 4,500,000 L.

The holding basins will be inspected weekly for signs of leaks. Any leaking water will be collected and pumped into another basin, or if there is no space back into the same basin, and the source of the leak will be determined and repaired.

3. STORAGE OF PETROLEUM HYDROCARBONS

As part of the spill emergency response plan, the City of Iqaluit is responsible for implementing, through the subcontractor responsible for the treatment of contaminated water at the landfill, the following procedures:

Liquid hydrocarbons will be stored at the water treatment site. Diesel generators will be used to power the treatment unit. These generators have their own storage tanks. In addition, there are 2 diesel-fired water heaters on-site; each will have its own storage tank. The storage site will be inspected daily, for signs of leaks or spills. The list of hydrocarbon products including the size and type of storage container and estimated volume to be stored at each location is listed below:

- Water Heaters:
  - Diesel Fuel – 2 reservoirs of 1,000 L each;
- Generators:
  - 25 kW generator – diesel fuel – 300 L;
  - 125 kW generator – diesel fuel – 1,000 L.

An emergency spill response kit will be installed at each of the liquid storage locations. The spill kits will be inspected and maintained during the inspection of the storage sites, if required. All spill kits will contain the appropriate type, size and quantity of equipment for the volume and type of product present at the storage location, as well as for the environment likely to be affected by a spill (i.e., soils/water). The spill kits will also include a fire extinguisher.

4. ACID, LIME AND POLYMER STORAGE

As part of the treatment program, the pH[1] of the water must be adjusted. First, the pH is raised above 8.5 using lime to cause the metals to come out of solution. Immediately following this, a polymer is added to the water to remove the suspended solids including the metals. Both the lime and the polymers are in a powder form. They are stored in a locked marine container, according to the manufacturer's instructions. They are not stored with incompatible products.

The lime is in 25 kg bags, and the maximum quantity of lime to be stored on the Site will be 6,000 kg. The polymer also comes in 25 kg bags, and the maximum quantity of polymer to be stored on-site will be 750 kg.

Any powder form of either of the lime or the polymer that is spilled will be collected using a shovel, placed in a water-tight container, and disposed of as per the manufacturer's instructions and local regulations.

In the final stage of the treatment, sulphuric acid is added to the water to lower the pH to between 7 and 7.5. The acid is shipped in a liquid form in 1000 L tote tanks. Only one tote tank is at the treatment site at any given time. The remainder of the acid is stored at Qikiqtaaluk Environmental's (QE) EWPF[2] located at 2027 Iqaluit Lane in Iqaluit.

At the Site, the acid is contained in a spill tray of sufficient capacity to hold the entire volume of the tote tank should the containment be breached. Furthermore, access to the area where the tote tank is stored is restricted by a plywood barrier with labelling indicating the danger, so as to ensure that no unauthorized and untrained personnel come in contact with the acid. Furthermore, the acid is stored in a location that, should a spill of acid occur, it will flow into the bioreactor.

The maximum quantity of acid stored on the Site is 1,000 L. The maximum quantity of acid stored at the EWPF is 3,000 L.

1 Measure of acidity or alkalinity
2 Environmental Waste Processing Facility

5. CONTAMINATED WATER

The contaminated water is stored in 2 holding basins and in the bioreactor. During normal operations, a spill from the holding basins should not occur. The only time that there is potential of a spill from the holding basins is during the transfer of water from one basin to another. To prevent spills, all hoses and pumps will be visually inspected hourly to ensure that there are no leaks or breaks in the lines. Pumping operations will be supervised by a QE Technician specialized in water treatment and spill response.

Should a spill of contaminated water be found, the water will be immediately contained, and pumps will be used to pump the spilled water into the nearest holding basin compatible with the type of water spilled. Soil testing will be performed to ensure that no residual contamination remains in the soils following the removal of the contaminated water.

6. DUTIES AND RESPONSIBILITIES

As part of the spill Emergency Response Plan, the City of Iqaluit and QE are responsible for implementing, through their respective management teams, the following procedures:

- Training of Site personnel in spill response procedures and the proper use of response equipment and materials;
- In the event of a spill, mobilize all available site personnel, equipment and tools, as required;
- Implement all required health and safety procedures at the site of the spill;
- Eliminate all fire hazards and potential ignition sources near the spill area;
- Control the source of the spill (i.e., reduce or stop product discharge);
- Contain the spilled product using the most appropriate methods and equipment (i.e., dykes, ditches, sorbent materials, containment booms, and other barriers);
- Evaluate the possibilities of recovering spilled materials;
- Obtain, if required, assistance from government agencies such as Environment Canada and the Government of Nunavut's Department of Environment;
- Comply with all applicable guidelines and regulations;
- Conduct a preliminary assessment of environmental impacts;
- Report the spill to the Government of Nunavut Spill Report Line, within 24 hours of the event, and submit a written spill report using the appropriate form (see below for the list of information required in the report).

Table 2 presents the management team members responsible for overseeing emergency spill response operations and their contact information.

TABLE 2
City of Iqaluit Landfill Water Treatment Program Management Contact Information

Position	Contact	Telephone Number
Incident Commander	Raphael Gagnon	514 809-0496
Back-up Incident Commander	Martin Lemay	867 222-3246
Project Manager	Olivier Simard	867 222-8194
Project Director	Greg Johnson	514 717-7604
City of Iqaluit Fire Department	Shift Supervisor	867 979-4422
City of Iqaluit Project Manager	Richard Sparham	867 979-6363, ext. 259
City of Iqaluit Back-up Contact	Matthew Hamp	867 979-5653

As part of the spill response plan, the Incident Commander is responsible for implementing the following procedures:

- Assume authority over the spill scene and personnel involved;
- Activate the Spill Response Plan;
- Evaluate the initial situation and assess the magnitude of the spill;
- Develop an overall action plan;
- Report to the Project Manager and provide recommendations on resource requirements (additional manpower, equipment, materials, etc.) to complete the clean-up effort. The responsibility of the Project Manager is to mobilize personnel and equipment to implement the clean-up.

The responsibilities of the Project Manager also include the following:

- Report the spill to NT-NU 24-hour Spill Report Line at 867 920-8130;
- Provide liaison with Management and the City of Iqaluit to keep them apprised of clean-up activities;
- Obtain additional required resources not available on-site for spill response and clean-up;
- Document the cause of the spill and effectiveness of the clean-up effort, and implement the appropriate measures to prevent a recurrence of the spill;
- Prepare and submit follow-up documentation required by appropriate regulators;
- Ensure that the spill is cleaned up and all follow-up communications and reports are filed with the GN DoE[1] and ECCC[2] offices.

The responsibilities of the Project Director include the following:

- Work with the Project Manager on regulatory follow-up, as necessary;
- Act as the spokesperson with government agencies on any significant spill events.

The responsibilities of the City of Iqlaluit Project Manager include the following:

- Act as the spokesperson with government agencies as well as the public and the media as appropriate.

Once a spill event has been reported, the Incident Commander, will establish a specific strategy for containing and controlling the spill, and to initiate the clean-up activities. The Project Manager, along with other external resources such as the Iqaluit Fire Department, may act as technical advisers prior to and during the intervention. The trained Spill Response Team will conduct all emergency spill response operations under the leadership of the Incident Commander. During the clean-up phase of the intervention, other site personnel (e.g., heavy equipment operators, labourers, etc.) may be involved in the intervention. Figure 2 presents an organizational chart of the Spill Response Team.

1 Government of Nunavut Department of Environment
2 Environment and Climate Change Canada

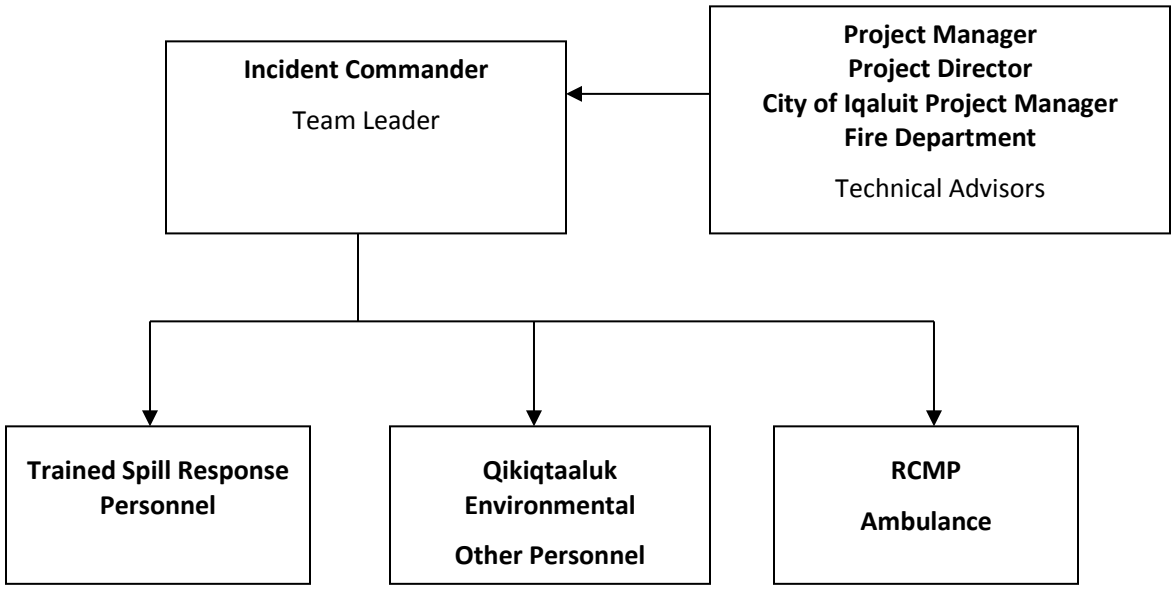

FIGURE 2: Spill Response Team Organization Chart

7. TRAINING AND DRILLS

All Site personnel will be advised that any spill of contaminated soils, whatever the extent, must be immediately reported to the Incident Commander.

The Incident Commander will select a certain number of workers to form the Spill Response Team. Crew members will be trained in emergency spill response procedures and operations. Training will include knowledge in the:

- Properties of the contaminated soils;
- Common causes of spills;
- Environmental effects of spills;
- Worker health and safety during emergency interventions;
- PPE[1] and clothing;
- Spill response procedures and techniques on land; and,
- Spill response equipment and materials.

Training will also include analysis of potential spill events that are more likely to occur during waste management operations. Spills are more likely to be caused by:

- Human error during the handling of hazardous waste containers;
- Rupture of waste containers due to accidental damage, deterioration or equipment failure.

Training will include spill response drills and classroom training.

1 Personal protective equipment

8. MATERIALS AND EQUIPMENT

In order to prevent spills and to provide adequate response in case of spill events, the City of Iqaluit and QE will maintain the appropriate types and quantities of response equipment and materials on the Site.

To facilitate immediate first response in the event of a release on land, 2 spill kits will be strategically placed in areas of contaminated soil excavation and placement. The contents of the spill kits are detailed in Table 3.

TABLE 3
Spill Kit Contents

Description	Minimum Contents	Quantity
1 yd^3 capacity For Contaminated Soil Excavation Areas	1 yd^3 Quatrex Bag Shovel Pairs of gloves	1 2 2
45 gallon capacity	45 gallon plastic drum Sorbent pads of 15” X 19” X 12 oz Sorbent socks 3” X 48” Sorbent booms 5” x 10' Epoxy sticks Disposal bags 40” x 60” x 6 mil Pairs of nitrile gloves	3 300 15 6 3 9 6

In addition to the spill response materials listed above, a loader, excavator, bulldozer and a dump truck are available to aid with spill response and recovery efforts.

9. SPILL RESPONSE PROCEDURES

A spill is defined as the discharge of contaminated soils, or any hazardous liquid, out of its containment and into the environment. Potential hazards to humans, vegetation, and wildlife vary in severity, depending on several factors including the nature of the material, the quantity spilled, the location and the season. Hazardous liquids are the principle types of waste materials that may be spilled, and therefore spill response procedures will focus on these types of materials.

All Site personnel will be briefed on the procedures to be followed to report a spill and initiate spill response. The first person to notice a spill will take the following steps:

1. Immediately warn other personnel working near the spill area;
2. Evacuate the area if the health and safety of personnel is threatened;
3. Notify the Incident Commander, who will initiate the spill response operations;
4. In the absence of danger, and before the spill response team arrives at the scene, take any safe and reasonable measures to stop, contain and identify the nature of the spill.

All spill response interventions carried out by the spill response team will follow these general procedures:

Source Control - Reduce or stop the flow of product without endangering anyone. This may involve very simple actions such as sealing a puncture hole with almost anything handy (e.g., a rag, a piece of wood, tape, etc.);

Protection - Evaluate the potential dangers of the spill in order to protect sensitive ecosystems and natural resources. Block or divert the spilled material away from sensitive receptors. This can also be achieved by using various types of barriers;

Clean up the Spill – Recover and containerize as much soil as possible. Recover and containerize/treat contaminated soils, water, and snow;

Report the Spill - Provide basic information such as date and time of the spill, type and amount of product discharged, location and approximate size of the spill, actions already taken to stop and contain the spill, meteorological conditions and any perceived threat to human health or the environment. Reporting requirements are presented in Section 10.

Response procedures specific to spills on land and snow are presented in the following sections. Because of the nature of the contaminated soils, and because the soils will not be crossing any waterbodies, response to spills on water are not discussed in this Plan.

Procedures will vary depending on the season. Spill response operations, techniques, equipment and materials are further detailed in the spill response training course manual.

9.1 Spills on Land

Response to spills on land will include the general procedures previously detailed. The main spill control techniques involve the removal of any soils contaminated by contact with contaminated water. Barriers should be used to limit the spreading of water to reduce the impacts on the surrounding soils and flora.

9.2 Spills on Water

Response to spills on water will include the general procedures previously detailed. The main spill control techniques involve the immediate stopping of the drainage of liquid into the waterbody. Barriers should be used to prevent any liquid from flowing into a waterbody.

10. POTENTIAL SPILL ANALYSIS

In order to prepare for emergency spill response, potential spill analysis was conducted on the worst case scenario. The exercise serves to identify potential risk areas, as well as to determine the fate of spilled products and their environmental effects. The potential spill scenario identified for this activity is:

1 Spill of tote tank full of acid.

This spill scenario is analysed in detail in the following page.

➢ Scenario #1: Spill of a Full Tote Tank of Acid

Description of incident: Spill of 1,000 L of hydrochloric acid from a tote tank;

Potential causes: resulting from operation over uneven ground or while putting the tote tank in place, human error, accident;

Hazardous products spilled: Hydrochloric acid;

Maximum volume spilled: 1,000 L;

Estimated time to spill entire volume: 30 seconds;

Immediate receiving medium: Soils;

Most probable direction of contamination migration: Since the area where the operations will occur is relatively flat, the soils will remain next to the tote tank;

Distance and direction to nearest receiving body of water: Bioreactor holding basin immediately adjacent and a drainage ditch approximately 10 m north-northeast of the containment area;

Resources to protect: Drainage ditch, which is away from the Site. The drainage ditch drains into Frobisher Bay, located 270 m from the Site. It should be noted that the operations will not pass over or near the drainage ditch, and since the contamination is on the top of the soils, there is no risk of it spreading quickly;

Estimated emergency spill response time: 5 minutes after spill is noticed;

Spill response procedures: Evacuate the area and call the fire department.

Safety hazards associated with the spill event: The acid spill could result in someone being splashed with the acid, which could cause chemical burns.

Measures and procedures to prevent such events from occurring: Include regular inspections of vehicles and heavy equipment on-site; establish speed limits on the worksite and further limit speed over rough or uneven areas; proper training of heavy equipment operators; safety orientation of workers, and use of a spotter when reversing; wearing of proper acid-resistant PPE when in proximity of the acid or during movement of totes containing acid.

➢ Scenario #2: Heating Oil Storage Tanks

The heating oil will be stored in a 1,000 L tank that will be located next to the marine container that holds the heating units.

Description of incident: 2 potential situations could occur that would cause a spill:

1. The accidental spill of fuel due to a fuel line break, or
2. The rupture of the storage tank, possibly due to a violent impact caused by a collision with a vehicle or heavy equipment;

Potential causes: Collision with the storage tank by heavy equipment or a vehicle, vandalism;

Hazardous products spilled: Petroleum, oil, lubricants, glycol;

Maximum volume spilled: In the first case, the spilled volume would be, at worst, 1,000 L, which represents the entire volume of the reservoir. In the other case, it can be assumed that the impact would occur at mid-height on the tank and, at worst, the spilled volume would not exceed ½ of the total volume (i.e., 500 L);

Estimated time to spill entire volume: In either case, the spill flow rate would be moderate to high, and it can be assumed that the entire volume would be spilled within 15 to 20 minutes;

Immediate receiving medium: Soils;

Most probable direction of contamination migration: The general direction of migration would be along the natural drainage pathway. This would cause the fuel to flow towards the bioreactor containment basin. A depression along the road between the road and the containment basin would most likely collect the fuel;

Distance and direction to nearest receiving body of water: Drainage ditch, approximately 10 m north-northeast of the containment area;

Resources to protect: Frobisher Bay, which is approximately 270 m away from the Site. It should be noted that the operations will not pass over or near the creek, and since the contamination is on the soil surface of the, there is no risk of it spreading quickly;

Estimated emergency spill response time: The spill would be communicated by the witness to the scene to the Incident Commander, or in his absence, the Back-up Incident Commander. The latter would then proceed down the chain of command and advise the appropriate persons of the immediate actions to be taken. Between 7:00 and 17:00, there should always be someone on the Site to supervise the operation of the water treatment unit;

Spill response procedures: The personnel responsibilities are outlined in previous sections of this document. The witness to the spill would be advised to try to stop the source of the spill, while waiting for assistance to arrive; his actions would be immediate. The Incident Commander would coordinate the spill response activities carried out by the containment unit. Members of this unit would be mobilized to the spill site.

Mobilization of containment equipment to the spill site can be carried out rapidly. A bucket loader can reach the Site of the spill within 15 minutes. Stockpiles of sand and gravel are also located in the vicinity, if required for berm construction. Spill response kits containing sorbent materials will be kept next to the fuel tank. Containment would be carried out by the construction of soil berms and the installation of sorbent booms. After containment, clean-up equipment can be mobilized to the Site. Excavators, loaders and dump trucks are all available as part of the project works. Should none be available, local contractors with the necessary equipment will be hired. There is a vacuum trailer unit in Iqaluit available for the collection of free product resulting from a spill;

Safety hazards associated with the spill event: These include the risk of fire. This can be minimized by preventing personnel from smoking near the spill scene. Risks to personnel (from inhalation and dermal contact) can be prevented by the proper use of PPE;

Measures and procedures to prevent such events from occurring: Include regular inspection of the fuel storage tank and containment system, and safety rules concerning the use of vehicles and heavy equipment on-site, especially in close proximity to this area (e.g., speed limits, training of heavy equipment operators, restricted area posting, worker safety orientation, etc.).

➢ Scenario #3: Fuel Delivery

Description of incident: The fuel delivery operations (fuel truck) to supply fuel to the heating oil storage tank present some risk of spills. Any accident involving the fuel delivery truck could result in the loss of its entire volume of fuel. Such an accident could occur almost anywhere on-site, anywhere the fuel truck has access;

Potential causes: Damage to the truck, accident with another vehicle, roll-over of the truck;

Hazardous products spilled: Diesel fuel;

Maximum volume spilled: This would be the volume of the storage tank on the back of the fuel truck. The largest truck holds 18,488 L;

Estimated time to spill entire volume: Depends on nature of incident, anywhere from 10 to 15 minutes to up to an hour;

Immediate receiving medium: Soils, possibly a waterbody, depending on where the incident occurs;

Most probable direction of contamination migration: The spill will proceed downgradient from the spill location. The direction will depend on the topography of the area where the spill occurs;

Distance and direction to nearest receiving body of water: The nearest body of water is the bioreactor, approximately 20 m away. Drainage then leads to Frobisher Bay, approximately 260 m away;

Resources to protect: Any nearby waterbodies or drainage ditches, structures and minimize the area of impacted soils;

Estimated emergency spill response time: The personnel responsibilities are outlined in previous sections of this document. The witness to the spill would be advised to attempt to stop the source of the spill, while waiting for assistance to arrive; his actions would be immediate. The Contractor's Site Technical Advisor would coordinate the spill response activities carried out by the containment unit. Members of this unit would be mobilized to the spill area. It is anticipated that an initial mobilization to a spill site would take no more than 10 minutes;

Spill response procedures: Any spills would be communicated by the witness to the Incident Commander, or in his absence, the Back-up Incident Commander. The latter would then proceed down the chain of command and advise the appropriate persons of the immediate actions to be taken. Radio communication will be used at all times on the Site; as such, key team members will carry a radio with them at all times.

Mobilization of containment equipment to the spill site can be carried out rapidly. Sorbent booms may be required to contain the oil slick and prevent further spreading or migration to any discharge stream. If the construction of an oil-water separator in the discharge stream is necessary, the following equipment and materials would be required: heavy equipment (loader or excavator), sand and gravel, piping, and tarp/geomembrane. This equipment and materials could all be mobilized within 20 to 30 minutes. If the fuel reaches a discharge stream, spill response measures may need to be implemented further downstream. After containment, clean-up equipment will be mobilized to the area. Excavators, loaders and dump trucks are all available as part of the project works. Should none be available, local contractors with the necessary equipment will be hired, including a vacuum unit, if required. However, due to the size of the temporary fuel tanks used for delivery/supply, potential impacts from spills are likely to be rapidly contained;

Safety hazards associated with the spill event: These include the risk of fire. This can be minimized by preventing personnel from smoking near the spill scene. Risks to personnel (from inhalation and dermal contact) can be prevented by the proper use of PPE;

Measures and procedures to prevent such events from occurring: These include regular safety regulations regarding the use of vehicles on the Site, especially in close proximity to sensitive areas (e.g., speed limits, training of truck drivers, etc.).

11. REPORTING REQUIREMENTS

Quantities of hazardous substances spilled which require reporting are listed in Schedule B of the Nunavut Spill Contingency and Reporting Regulation[1]. For example, all flammable liquid (Class 3) spills of volume equal to or greater than 100 L (half a drum) require reporting.

After the initial field emergency response to the spill event, the spill will be reported to the 24-hour Spill Report Line:

24-Hour Spill Report Line

Tel. 867 920-8130

or

Fax 867 873–6924

Additionally, the spill must be reported to AANDC[2] to the following person:

Erik Allain

Manager Field Operations

Tel. 867 975-4295

Fax: 867 975-6445

Should the spill be of a nature, or in a location, that affects airport activities, the airport authorities will also be notified of the spill immediately following the notification of the Spill Report Line and AANDC.

Failure to report a spill can lead to fines. It is the responsibility of the Project Manager to prepare the proper reports and transmit them to regulatory authorities. Table 4 presents an additional contact list for spill reporting.

TABLE 4
Contact List for Spill Reporting

Department	Person	E-mail	Telephone
GN DOE	Kristi Low	klowe@gov.nu.ca	867 975-7748
Fire Department (general) Fire Department (emergency)	-	-	867 979-5655 867 979-4422
Royal Canadian Mounted Police - Iqaluit	-	-	867 979-0123
Ambulance	-	-	867 979-4422

Afterwards, the spill event will be reported in writing using the standard Spill Report Form presented in Appendix A.

1 https://www.justice.gov.nt.ca/en/files/legislation/environmental-protection/environmental-protection.r2.pdf
2 Aboriginal Affairs and Northern Development Canada

The written report will include the following information:

- Date and time of the incident;
- Location or map coordinates and direction of spill movement, if not at steady-state;
- Party responsible for the spill;
- Type and estimated volume of spilled contaminant(s);
- Specific cause of the incident;
- Status of the spill indicating if spilled materials are still moving or now at steady-state;
- Approximate surface of contaminated area;
- Factors affecting spill or recovery such as temperature, wind, etc.;
- Status on containment actions indicating whether a) naturally, b) booms, dykes or other, c) no containment has been implemented;
- Corrective action taken, or proposed, to clean, contain or dispose of spilled material;
- Whether assistance is required and in what form;
- Whether the spill poses a hazard to persons or property (i.e., fire, drinking water);
- Comments and recommendations;
- Name, position and employer of the person reporting the spill; and,
- Name, position department of the person to whom the spill is reported.

APPENDIX A

Standard Nunavut Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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