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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: 1BR-IIA1518

August 11, 2015

John Wood
Chief Executive Officer
Arctic Infrastructure Limited Partnership
Suite 5600, 100 King Street W
Toronto, Ontario
M5X 1C9

Emails: john.wood@aip-iiaip.com

RE: NWB Water Licence No. 1BR-IIA1518

Dear Mr. Wood:

Please find attached Licence No. **1BR-IIA1518** issued to Arctic Infrastructure Limited Partnership by the Nunavut Water Board pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*. The terms and conditions of the attached Licence related to Water use and Waste disposal are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then Water use and Waste disposal must cease, or the Licensee will be in contravention of the Nunavut Land Claims Agreement. However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least three (3) months prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this licence, the NWB may decide, in the public's interest, to hold a public hearing. The Licensee should submit applications for

amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment; however, a minimum of sixty (60) days is required from time of acceptance by the NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and acknowledged by the Manager of Licensing.

The comments received by interested persons on issues identified during the Application are attached for your consideration.[1]

Sincerely,

Thomas Kabloona
Nunavut Water Board
Chair

TK/bm/ri

Enclosure: Licence No. **1BR-IIA1518**
Comments – AANDC

Cc: Qikiqtani Distribution List

[1] Aboriginal Affairs and Northern Development Canada (AANDC) – Water Resources Division, June 8, 2015

DECISION

LICENCE NO.: 1BR-IIA1518

This is the decision of the Nunavut Water Board (NWB) with respect to an application dated April 21, 2015 for a new Water Licence made by:

ARCTIC INFRASTRUCTURE LIMITED PARTNERSHIP

to allow for the use of Waters and disposal of Waste to support industrial activities at the Iqaluit International Airport, located within the Qikiqtani Region, Nunavut, generally at the following geographical coordinates:

Latitude: 63° 45' 57.1" N	Longitude: 68° 34' 44.6" W
Latitude: 63° 45' 56.5" N	Longitude: 68° 31' 57.8" W
Latitude: 63° 45' 30.6" N	Longitude: 68° 32' 52.8" W
Latitude: 63° 45' 14.8" N	Longitude: 68° 33' 11.3" W **(**Project Extents)

DECISION

After having been satisfied that the project is situated outside of an approved Land Use Plan[2], exempt from the requirement for screening as described within Schedule 12-1, by the Nunavut Impact Review Board[3] in accordance with Article 12 of the *Nunavut Land Claim Agreement* (*NLCA*), the NWB decided that the application could proceed through the regulatory process. In accordance with s.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (*Act*) and Article 13 of the *NLCA*, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the Applicant and considering the representations made by interested persons, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the *NLCA* and of the *Act*, waived the requirement to hold a public hearing, and determined that:

Licence No. 1BR-IIA1518 be issued subject to the terms and conditions contained therein. (Motion #: 2015-B1-025)

Signed this 6th day of August 2015 at Gjoa Haven, NU.

Thomas Kabloona
Nunavut Water Board, Chair

[2] Nunavut Planning Commission (NPC) Conformity Determination, May 22, 2015.
[3] Nunavut Impact Review Board (NIRB) Screening Exemption Decision, June 1, 2015.

Acronyms

AANDC – Aboriginal Affairs and Northern Development Canada
AILP – Arctic Infrastructure Limited Partnership
BTEX – Benzene, Toluene, Ethylbenzene, Xylene
CCME – Canadian Council of the Minsters of Environment
CRA – Conestoga-Rovers & Associates
IIAIP – Iqaluit International Airport Improvement Project
JFSA – J.F. Sabourin and Associates Inc.
LTU – Land Treatment Units
MOE – Ministry of the Environment
NIRB – Nunavut Impact Review Board
NLCA – Nunavut Land Claims Agreement
NPC – Nunavut Planning Commission
NWB – Nunavut Water Board
PAH – Polycyclic Aromatic Hydrocarbons
PHC – Petroleum Hydrocarbons
QE – Qikiqtaaluk Environmental Inc.
SGMP – Soil and Groundwater Management Plan
TC – Transport Canada

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I. BACKGROUND

The Iqaluit International Airport Improvement Project (IIAIP or Project) encompasses the construction of a new Air Terminal Building, a new Combined Services Building, substantial improvements to the runways, taxiways and aprons, as well as construction of groundside infrastructure at the Iqaluit International Airport site, which is located approximately one kilometre west of the City of Iqaluit. The Project is managed as a Public Private Partnership (PPP), between Arctic Infrastructure Limited Partnership (AILP) and the Government of Nunavut (GN). The private partner, AILP, will manage the construction activities, and operate and manage the Iqaluit Airport site for thirty years thereafter; whereas the GN, as the public partner, will retain ownership of the site throughout the lifespan of the project and will resume active authority over the site when AILP's contract ends in 2047.

First developed by the United States Government in the 1940s, ownership of the Iqaluit Airport has since changed hands between the Government of Canada, Transport Canada, and most recently the GN since 1999. As part of the transfer agreement to the GN, environmental contamination at the site was to be remediated prior to the transfer, and as such several environmental site assessments and remediation projects occurred in the 1990s. Still, certain environmental risks remained, and prior to commencing construction activities, the AILP conducted Phase I and Phase II Environmental Site Assessments (ESAs) in September 2013, which highlighted four areas of environmental concern: a drum cache, Petroleum Hydrocarbons (PHC) impacted soil from previous land treatment units, arsenic contaminated soil alongside the runway, and Polycyclic Aromatic Hydrocarbon (PAH) impacted groundwater. Expanding upon these findings, Qikiqtaaluk Environmental Inc. (QE) conducted a Phase III Environmental Site assessment in June 2014 to determine the extent of the contaminated areas, at which time it was also discovered that several test pit samples displayed chromium concentrations in excess of CCME Soil Quality Guidelines.

The AILP developed the Soil and Groundwater Management Plan (CRA, QE, 2015) which provided remediation and mitigation measures for the contaminant sources identified, as well as Water and Waste Management procedures for the IIAIP. Moreover, the Plan contained the following additional management plans in the appendices:

- Environmental Impacts Plan
- Erosion and Sediment Control Plan
- Hazardous Waste Management Plan
- Long-Term Monitoring Plan
- Specifications for Cell Cover
- Spill Contingency Plan
- Water Management Plan

The Soil and Groundwater Management Plan (SGMP) indicated that QE facilitated the

transportation and disposal of the drum cache at an approved facility in southern Canada, except for a large reservoir, which was cut-up and disposed of in the City of Iqaluit's landfill. The Plan also stated, however, that a second drum cache was found during excavation of the footprint of the Taxiway F, which the AILP plans to dispose of following the same methodology as the first drum cache.

PHC and arsenic impacted soils were originally intended for use as fill pursuant to meeting certain risk-based environmental conditions, however, this strategy was abandoned, and the impacted soils—totaling 8,249 m^3 combined—are being stored in a lined containment cell awaiting proper disposal or treatment. To address the PHC contaminated groundwater, the AILP plans to isolate and test—and possibly treat—all Water encountered in this area during construction activities, and line the bypass channel that will pass through this area with an impermeable geomembrane.

Construction activities for the IIAIP are planned to occur from 2014 to 2017. To accommodate contract workers during this period—approximately 60—a temporary camp will be constructed, for which the AILP has entered into an agreement with the City of Iqaluit for Municipal Services to manage the camp's Water supply and Waste disposal. A number of the IIAIP's stated construction activities require Water-use authorization: the AILP plans to use Water for dust suppression and spraying of aggregate on-site, permanently realign and temporarily divert sections of Carney Creek, excavate or enhance a number of drainage ditches, and install several new culverts and fish habitat areas within on-site watercourses. Moreover, following the cessation of planned construction activities near the end of 2017, the AILP plans to construct a Landfarm Facility to treat PHC contaminated soils currently held in the site's Containment Cell, which will also require authorization under a water Licence. However, the Landfarm Facility is not covered under the scope of this Licence as the parameters of its design are ill-defined; the Application states, "Options for the licenced LTU [Landfarm Treatment Unit] include ones off the airport site, a new onsite LTU specifically engineered and licenced to treat contaminated soils from the airport site, or an engineered modification of the Containment Cell to allow remediation." From this statement it is understood that the Applicant has yet to finalize its plan to manage contaminated soil, and when it does, it will apply accordingly to the Board for an amendment to its Licence. It is also understood that near the end of construction activities the AILP will reassess its Water use, Waste management and licensing obligations as it moves towards the operations and long-term monitoring phase of the undertaking.

II. PROCEDURAL HISTORY

Previous Submissions

On **August 19, 2014,** the Nunavut Water Board (NWB or Board) received a water licence application from Bouygues-Sintra Joint-Venture. After the NWB's initial review of the application and further discussion between the NWB and the applicant, it was agreed that the

applicant would resubmit its application under a different Licensee and with changes to the scope.

On **February 6, 2015**, the NWB received a water licence application from Arctic Infrastructure Limited Partnership (AILP). After a preliminary technical review, the NWB provided the Applicant with a letter of deficiencies related to the application on February 12, 2015, and in response the applicant indicated that it would resubmit its application.

Current Application

On **April 21, 2015**, the NWB received a new water licence application and the following supporting documents (the Application) from AILP (Applicant, Proponent or Licensee):

- Cover letter dated April 21, 2015;
- Certificate of Incorporation, dated September 13, 2013;
- Signed General Water Licence Application;
- Executive Summary, English and Inuktitut;
- AILP Authorization letter for Mr. Igor Bogouchevski;
- NWB Supplement Technical Information Required for Water Crossings;
- Environmental Management of Chromium in Soil: IIAIP, November 2014;
- Letter – Report JFSA Fish Habitat Survey, July 12 2014;
- DFO letter: Implementation of Mitigation Measures to Avoid Harm to Fish, August 11, 2014;
- Iqaluit Airport and NTS Map (Appendix D);
- Land Map (Appendix J);
- Email: Memo of Intent from the City of Iqaluit, January 23 2015;
- NIRB Screening Determination, dated May 31, 2012;
- NPC Land Conformity Determination, dated June 19, 2014;
- Email: NWB Chromium Ruling, dated November 17, 2014;
- Officer List;
- Pre-Existing Environmental Contamination Management Plan;
- Letter including Report: JFSA Request for Review Iqaluit International Airport Improvement Project dated July 22, 2014; and
- Soil and Groundwater Management Plan Including Addendum, with the following Appendices:
  - Appendix A:
    - Phase III Environmental Site Assessment, Iqaluit Airport, June 26, 2014
  - Appendix B:
    - Disposal of Drum Cache Area Waste Photos and Certificates of Disposal
    - Letter – Report: Drum Cache Clarification Tank Disposal, December 17 2014;
    - Letter on Report of Drum Cache Activities, October 1, 2014
  - Appendix C:

  - Letter on Characterization of Soil Lay Down Area Next to Apron, Iqaluit Airport, September 17, 2014;
  - Remediation Work Plan Iqaluit Airport, August 25, 2014;
- Appendix D:
  - Figure of Location of Contaminated Water Holding Basins to be Constructed, Water Discharge Points and Hazardous Waste Storage;
- Appendix E:
  - Environmental Impacts Plan, October 2014;
  - Erosion and Sediment Control Plan, July 14, 2014;
  - Hazardous Waste Management Plan, March 2015;
  - Long-Term Monitoring Plan, April, 2, 2015;
  - Specifications for Cell Cover, March 20, 2015;
  - Spill Contingency Plan, April 2, 2015;
  - Water Management Plan, March 2015.

The above-mentioned application documents have been placed in the NWB's public registry and access provided through the NWB's FTP site using the following link:

ftp://ftp.nwb-oen.ca/1%20PRUC%20PUBLIC%20REGISTRY/1%20INDUSTRIAL/1B/1BR%20-%20Remediation/1BR-IIA1518-%20AILP/

The NWB distributed the Application on May 8, 2015, for a thirty (30) day public review period; comments were received from Aboriginal Affairs and Northern Development Canada (AANDC). AANDC provided comments with respect to a number of issues related to the Application, and recommended that concerns related to Water sources and Water monitoring be resolved before the issuance of a licence. The concerns were forwarded to the Proponent on June 9, 2015, along with deficiencies identified during the NWB's own technical review, and on July 2, 2015, the NWB received the following documents to address the issues identified:

- Letter Response outlining changes, July 2, 2015;
- Camp Service Agreement Executed June16, 2015 (Appendix 1);
- Water Management Plan Rev 002, revised June 2015 (Appendix 2);
- Soil and Groundwater Management Plan, with Addendum, Rev 002, June 2015;
- Quarry Location Site Map – SGMP Appendix D (Appendix 4);
- Cell and Water Extraction Site Map (Appendix 5);
- Long Term Monitoring Plan, Rev 002 – SGMP (Appendix 6) June 2015;
- Spill Contingency Plan, Rev 002 – SGMP (Appendix 7) June 2015; and
- Hazardous Waste Management Plan, Rev 002 (Appendix 8), June 2015.

On May 8, 2015, in accordance with s.11.5.10 of the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada* (NLCA), the NWB sent

the project proposal to the Nunavut Planning Commission (NPC), to determine whether the project proposal is in conformity with an approved land use plan. In addition, and in accordance with s.13.5.1 of the NLCA, the NWB requested that the Nunavut Impact Review Board (NIRB) determine whether the project requires environmental screening. On May 22, 2015, the NWB received confirmation from the NPC, that the project is located outside the boundary of an approved Land Use Plan; and a determination from the NIRB on June 1, 2015, that the proposal is exempt from screening pursuant to item 5 of Schedule 12-1 of the NCLA.

GENERAL CONSIDERATIONS

A. Term of the Licence and Scope

In accordance with the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* s. 45, the NWB may issue a licence for a term not exceeding twenty-five years. The Applicant requested a ten (10) year licence term under which it planned to finish construction of the new airport, and continue environmental monitoring of contaminated soils stored in the containment cell. In its review of the Application, AANDC recommended a two (2) year licence term with reasoning that after the cessation of construction activities, Water abstraction will presumably no longer be necessary and the Licence should likely be amended. The NWB concurs with this logic, but has issued a licence term of three (3) years to allow for construction activities to continue for the entirety of 2017. A three (3) year licence term should enable the Licensee sufficient time to finish and demobilize construction related activities, re-assess its scope of activities in relationship to Water management, redefine the parameters of its long-term monitoring program if needed, and submit the conclusions of this assessment to the NWB in the form of an application for cancellation or renewal of the Licence in 2018.

Scope:
The Application lists the scope of the undertaking as "the design, construction, financing, operations and maintenance of the Iqaluit International Airport (the Airport)…In addition, the Private Partner, Arctic Infrastructure Partnership Limited will operate and maintain the existing Airport during construction of the new facilities and for 30 years after the construction is completed." The activities covered in detail by the Application include:

- Management of impacted soil;
- Re-alignment and improvement of Inner-field and Landside drainage ditches;
- Installation of landside culverts; and
- Fisheries and Oceans Canada offsetting measures, including the culvert bridge installation on Federal Road and other works in Carney Creek.

In addition, the Application defines long-term monitoring programs for surface Water quality and contaminated soil.

Although the Application lists the long-term operations of the Iqaluit Airport as a component of the undertaking, very little information is provided about what activities associated with the long-term operations and maintenance of the Airport will require Water-use authorization from the Board. The Board stresses that the current Licence covers the activities listed above, and should the Licensee determine that any of its planned activities, associated either with the construction of the specific improved airport facility components or the long-term operation of the airport, and not already included within this Licence, require authorization for Water Use or Waste Disposal, the Licensee shall be required to apply to the Board for an amendment to its Licence.

B. Annual Report

Under the reporting section of the Licence, Part B, Item 1, the Licensee is required to submit, on an annual basis, a report that pertains to the use of Water, deposit of Waste and environmental monitoring. This information is kept in the NWB's public registry and made available to interested persons upon request. In addition, the NWB maintains annual reporting information on its FTP site, which can be accessed using the following link: http://nwb-oen.ca/public-registry

C. Water Use

The Licensee requested a maximum Water use volume of 100 cubic metres per day; six (6) cubic metres to supply potable Water for the temporary worker's camp, and ninety-four (94) cubic metres for dust suppression and spraying of aggregate. The AILP has entered into an agreement with the City of Iqaluit[4] for the camp's Water supply to be accommodated by municipal services; as such, authorization for this activity is not covered under this Licence. The Board notes that the City's Water Licence (3AM-IQA0612) expired in 2012, but is currently undergoing the renewal process at the time of issuance of this Licence.

Regarding the use of Waters for dust suppression and spraying of aggregate, the NWB has authorized the use of ninety-four (94) cubic metres per day, and reminds the Licensee that it is required to install flow meters or other such devices, or implement suitable methods required for the measures of daily Water-use volumes under Part C, Item 2 of this Licence.

The Licensee is reminded that dust suppression activities should conform to GN's *Environmental Guideline for Dust Suppression on Unpaved Roads* (GN, 2014). Water for dust suppression and soil conditioning is to be sourced from two locations in the Inner-Field Drainage area where surface Water runoff from the site collects. In addition, a backup Water source is located roughly 1000 metres north of the airport. During the Application process the NWB expressed concern that Water in the Inner-Field Drainage area may contain elements of PHC contamination due to the legacy of industrial activity on-site. The Applicant responded by incorporating a surface water monitoring program into the Water Management Plan, of which the details are expressed in Part J.

The Application furthermore indicates that the undertaking will involve watercourse training and the temporary alteration of the flow of Waters, which classifies as licensing criteria for use of Waters pursuant to Column 3 and Column 4 of Schedule 2 of the *Nunavut Waters Regulations*. Under these provisions the Board has granted authorization to perform these activities as described in the Application, namely, for the permanent realignment of Carney Creek along a 450 metre stretch and for the temporary diversion of Carney Creek to allow the installation of a

[4] Camp Services Agreement, executed June16, 2015.

250 metre arch culvert. The Licensee is required under Part C, Item 4 of the Licence to record the daily flow of Water diverted to the temporary diversion ditch during the arch culvert install.

D. Deposit of Waste

Details included in the Application indicate that the undertaking is expected to generate the following types of Waste: Sewage, Non-hazardous solid Waste, Waste oil, Hazardous Waste, bulky items/scrap metal and contaminated soil. The following strategies will be employed to handle the Waste generated by the undertaking.

Sewage and Non-hazardous Solid Waste

The Licensee entered into an agreement with the City of Iqaluit for Sewage and domestic Waste generated by the camp, including non-contaminated bulky items and tires, to be managed by municipal services, and as such, disposal of these Waste-types are not included within the scope of this Licence. A copy of this agreement entitled Water and Sanitation Services Agreement was included in the Application, and the Licensee is obligated to notify the Board in writing if changes to this agreement occur related to Water and Waste management.

As noted previously, the City of Iqaluit's Water Licence (3AM-IQA0612) expired in 2012, and at the time of issuance of this current Licence, the City was still in the process of renewing its licence.

Hazardous Waste

The Licensee shall adhere to the approved Hazardous Waste Materials Management Plan (June 2015). The City of Iqaluit's Waste Disposal Facility cannot accept Hazardous Waste and therefore the Licensee intends to ship all encountered Hazardous Waste, including Waste oils and batteries, to an approved disposal facility in the South. Shipments to the South will occur a minimum of once per year, and while awaiting shipment Hazardous Waste will be stored in a Hazardous Waste transfer facility in Iqaluit. The Licensee is reminded that Hazardous Wastes must be handled in accordance with applicable regulations, including Transport Canada's *Transportation of Dangerous Goods Regulations* (TC, 1992) and GN's *Environmental Guideline for the General Management of Hazardous Waste* (GN, 2010).

Importantly the Licensee highlighted in the Application the presence of two Drum Caches that required remediation and disposal of associated contaminated materials. The first drum cache, as detailed in the Pre-Existing Environmental Contamination Management Plan, was successfully remediated in 2014, with the Licensee providing evidence that the associated Hazardous Waste was shipped to an approved facility in the South.[5] In regards to Drum Cache 2, uncovered during excavation work for Taxiway F, the Licensee has indicated that excavation, remediation and disposal activities will follow the same methodology employed for the first drum cache;

[5] Email from Greg Johnson, QE Environmental, to Geoffroy Lecureur, Sintra, October 1, 2014.

likewise, underlying soil will be tested and any impacted material will be contained or shipped to an approved facility, and collected Water will be pumped into a holding basin, tested, and treated and/or discharged. The Licensee is required, under Part I, Item 2 of the Licence, to submit a remediation report for Drum Cache 2 detailing a summary of activities, sampling results and volumes of Waste shipped to an approved facility within ninety (90) days following the excavation of contaminated materials.

Contaminated Soils

The SGMP identifies two primary sources of contaminated soils: 1) Arsenic impacted material originating from the runway area, and 2) PHC impacted material resulting from a previous land farm facility that the IIAIP has assumed responsibility for. Although originally planned for use as fill material pursuant to a Tier III Risk Based Approach, this strategy was abandoned for both sources, and both soil volumes will now be stored in a bermed and lined containment facility until proper remediation or disposal methods are finalized.

The NWB reviewed the following documents included within the Appendices of the SGMP related the these contaminated soils: Remediation Work Plan Iqaluit Airport 2014-08-25, Characterization of Soil Lay Down Area Next to Apron, and, Installation of Geomembrane Cover for Iqaluit Airport Hydrocarbon Contaminated Soils from the TC Landfarms and Arsenic Contaminated Soils. The NWB understands from these documents that Arsenic and PHC impacted soils will be stored together—but segregated—in the Containment Cell on-site until 2018, at which point the soils will be re-sampled and compared against relevant CCME guidelines. Arsenic impacted soil in exceedance of relevant criteria will be contained and shipped to an approved Waste disposal facility in the South; whereas the AILP tentatively plans to actively treat PHC contaminated soils on-site in a Landfarm Facility to be built after construction of the IIAIP concludes. The Board has not included a Landfarm Facility within the scope of this Licence, as Section 2.4.2. of the Soil and Groundwater Management Plan with Addendum (June 2015), indicates that questions remain regarding the size, location and need of a Landfarm Facility. If and when the Licensee plans to build a landfarm structure(s), the Licensee shall be required to submit an application and supporting documentation—signed design drawings and Management Plan—to amend the Licence.

The SGMP also states that a soil sampling program will be initiated should strange odours, soil staining or sheens, or buried debris be encountered during construction activities. Should additional soil sampling occur, the Licensee shall submit a tabular summary of the results with the Annual Report. Should the results indicate that remedial action is required, the Licensee shall submit a corresponding management plan—indicating Waste volumes, location(s), sampling results and disposal strategies—to the Board for approval in writing. Approval from the Board must be received prior to any remedial activities taking place.

Chromium

During the Phase III Environmental Site Assessment performed by QE Environmental in 2014, total chromium concentrations in excess of CCME Soil Quality Guidelines for Industrial Use (87 mg/kg) were uncovered in samples taken from an area adjacent to Taxiway G. The Licensee requested that the Ontario Ministry of the Environment's (MOE)[6] soil standard for total chromium (160 mg/kg) be used as reference to determine contamination, due to Iqaluit's shared geo-chemical characteristics with the Canadian Shield Region. After a review of the sampling results and additional information submitted by the Applicant, including the report entitled Environmental Management of Chromium in Soil: Iqaluit International Airport Improvement Project, which analyzed soil sampling results at the Iqaluit Airport Site, a geological study of the South Baffin Island region conducted by the Geological Survey of Canada in 2005, and scientific guidance documents from the Ontario Ministry of the Environment, the Board supports the use of the Ontario Ministry of the Environment's total chromium soil standard of 160 mg/kg to determine contamination related to this parameter. Importantly, soil samples at the site revealed below-detectable concentrations of hexavalent chromium (CrVI), which suggests a non-correlative relationship between chromium concentrations and anthropogenic activity. Further to that the Applicant states that "with the approval of the site-specific criterion presented in the WSP report entitled Environmental Management of Chromium in Soil, dated November 2014 these soils no longer require any special management, and will be used as fill at the CSB [Combined Services Building] site and surroundings".

PAH-Impacted Groundwater:

The Pre-Existing Contamination and Management Plan, included as part of the Application, indicates that groundwater samples taken from a test pit (TP06) in the vicinity of the new Airport Terminal Building contained PAH concentrations greater than Ontario MOE groundwater standards. The IIAIP altered its work plan to minimize disturbance to the area affected by PAH groundwater contamination; however a bypass channel will need to be excavated to divert water from Carney Creek during the installation of an arch culvert. The Licensee plans to collect any groundwater seepage that collects in the channel during this construction activity and contain it in Holding Basins for testing and treatment if required. Also, the bypass channel will be lined with an impermeable geomembrane to prevent contaminated groundwater from coming into contact with creek Water. When processing Water held in the Holding Basins, the Licensee shall adhere to the sampling and discharge procedures presented in the approved Water Management Plan.

Surface Water:

A surface Water monitoring program will be carried out in order to ensure that the Project activities do not have a negative impact on the surface Waters next to or in the Project area. Monitoring stations for surface water have been established and will be monitored at the start

[6] Ontario Ministry of the Environment, Standards Development Branch (April 15, 2011) *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario*

and end of every season.

Contaminated Water:
As identified in the approved Water Management Plan, management of contaminated Water is planned to be undertaken by QE Environmental under the authority of its Water Licence, 1BR-THI1419. Although the NWB accepts this strategy, the Board notes that it is not limiting the Licensee to exclusively employ QE Environmental under its Water Licence 1BR-THI1419 to manage contaminated Water. Licence 1BR-THI1419 contains conditions that contradict certain conditions of this Licence—such a discharge parameters—and where discrepancies exist, the Board expects the Licensee to follow the conditions inherent in its Licence. As with Licence 1BR-THI1419, discharge criteria for the current Licence reflect CCME Guidelines for the Protection of Aquatic Life. However it is noteworthy that this Licence employs the NWT Municipal Waste Discharge standard for Arsenic. These standards are provided in Part D, Item 7 of this Licence. Any Water volumes displaying concentrations of identified substances in exceedance of the concentrations displayed in the Licence shall be considered Hazardous Waste, and the Licensee shall dispose of the Waste at a facility approved to process the Waste type.

De-icing
In its comments on the Application, AANDC Water Resources highlighted the potential for deposit of Waste to Waters resulting from de-icing activities. The most significant concern is associated with storm Water discharge to surface Waters and the release of glycol to the aquatic environment. To help mitigate this concern, the Board has included glycols within the chemical parameters of the surface water monitoring program, described in Part J of the Licence.

In the future, if the Licensee discovers that such activities are leading to a deposit of Waste as set out in s. 12 of the *Act*, the Licensee shall be required to submit a management plan for de-icing activities, and seek an amendment to the scope of the current licence or risk being in non-compliance with respect to the obligations in s.12(1) of the *Act*.

E. The Undertaking

The Board has approved the Soil and Groundwater Management Plan with Addendum, dated March 2015, revised June 2015, and associated management plans:

- Environmental Impacts Plan, Rev. 1.0, October 2014
- Erosion and Sediment Control Plan, July 2014
- Hazardous Waste Management Plan, Rev. 3.1, June 2015
- Long-Term Monitoring Plan, Rev. 3.4, June 2015
- Specifications for Cell Cover
- Spill Contingency Plan, Rev. 1.1, June 2015
- Water Management Plan, Rev. 1.3, June 2015

The Application indicates that the Licensee intends to convert the Containment Cell into a Landfarm facility after construction activities at the site conclude, at which point engineering drawings and management plans will be submitted to support an application for amendment to the Licence.

F. Drilling

Drilling is permitted exclusively for the installation of groundwater monitoring wells.

G. Construction activities

Information provided in the Application indicates that the following construction activities may directly influence Water resources: 1) Installation of culverts, 2) an arch culvert install with corresponding temporary realignment of Carney Creek, 3) construction and modification of drainage ditches, and 4) construction of improved fish habitat areas.

The Culvert Bridge Questionnaire, included in the Application, indicates that thirteen (13) culverts will be installed at the Airport site, between 600 and 1500 mm in diameter and from 18 to 69 linear metres in length. Also, to facilitate the installation of one arch culvert, 2100 by 3400 mm in diameter, and 250 metres in length, within the Ditch A trajectory (Carney Creek), the Licensee intends to divert Water along a temporary 350 metres long ditch skirting the east side of the work area during the install. Also related to this work, the Licensee will permanently realign a 450 metres stretch of Carney Creek directly upstream of the arch culvert install area, to a new course roughly ten (10) metres parallel—northeast—to the current pathway. A fish habitat survey completed by JFSA in 2014 revealed a population of Arctic Char (*Salvelinus alpinus)* in Carney Creek, and thus the IIAIP forwarded a project proposal detailing construction and realignment work related to Carney Creek to the Department of Fisheries and Oceans (DFO) for review. The proposal, described in Request for Review Iqaluit International Airport Improvement Project (IIAIP), included as part of the Application, indicated that the installation of the arch culvert in Carney Creek will result in the destruction of approximately 500 m^2 of fish habitat, and therefore plans were included to construct augmented fish habitat areas downstream of the arch culvert and in a stretch of watercourse located northeast of Carney Creek (WC-A). DFO responded with recommended mitigation measures that include seasonal restrictions to in-Water construction work, the development of an Erosion and Sediment Control Plan, and the requirement that in-Water activities do not interfere with fish passage, and, granting the implementation of these measures, concluded that the project will not result in serious harm to fish. The Application included an Erosion and Sediment Control Plan, which the Board has approved, and expects the Licensee to follow in all of its construction activities.

Other relevant construction activities where in-Water or near-Water work is expected include plans to realign an existing inner-field drainage course, crossing the inner field through Taxiway A and Taxiway G, and also, the excavation of drainage ditches alongside the new Taxiway A,

Taxiway G, and Taxiway F. The Board has also included general terms and conditions related to in-Water work under Part E, and reminds the Licensee that due to the sporadic presence of soil and groundwater contamination uncovered onsite, pooled Water collected in construction areas should be treated as potentially contaminated, and held in the Holding Basins for sampling verification and/or treatment before discharge.

Importantly, as outlined in conditions under Part E, the Licensee is responsible to monitor and maintain downstream Water quality during all in-stream work.

The Licensee identified a Quarry site immediately west of the construction site, from which it intends to extract approximately 10,000 m^3 of material for use via the cut and fill method throughout the site. The Licence contains conditions related to Quarry management under Part E.

H. Abandonment and Restoration

The Licensee is required to submit an Abandonment and Restoration Plan a minimum of ninety (90) days prior to decommissioning of all structures related to Water or Waste Management.

I. Spill Contingency Planning

The Board has approved the Spill Contingency Plan, Iqaluit International Improvement Project, included in the Application. Revisions to the Spill Contingency Plan should be included with the Annual Report.

J. Monitoring

The approved Contaminated Soil Management Long Term Monitoring Plan included in the Application, schedules regular visual inspections and groundwater sampling events of the Contaminated Soil Containment Area and is planned to continue for the lifespan of the landfarm (following conversion of the Containment Cell to a Landfarm Facility in 2018, upon application). Four (4) groundwater monitoring wells will be installed around the Containment Cell consisting of one (1) up-gradient of the site and three (3) down-gradient. The NWB notes that groundwater samples will be analyzed for PHC Fractions F1-F4 and BTEX, as well as for Arsenic, to reflect the characterization of the soils being contained. Visual and groundwater monitoring will occur annually for the first five (5) years under Phase I Monitoring. At this time, the monitoring data will be assessed to determine if groundwater chemical equilibrium has been reached, and if it has, monitoring will continue every two (2) years thereafter until the facility is decommissioned. Although the Monitoring Plan provides several response options if chemical demonstrate an upward trend over Phase I, in the event of an upward trend of elevating concentrations of deleterious substances, the Board, expects the Licensee to investigate and perform any required remedial actions (eg. replacing the liner) immediately. Lastly, the Board reminds the Licensee that all monitoring data is to be included with the Annual Report.

The approved Water Management Plan includes a Surface Water Monitoring Program that includes five (5) Monitoring Program Stations (IIA-5 to IIA-9) consisting of two (2) Stations upstream of the project site and three (3) Stations downstream of the site. Although construction activities at the Iqaluit Airport Site are not expected to result in a deposition of Waste to Water, both AANDC and the NWB expressed concern during the application period about potentially unidentified sources of contamination in the area, resulting from the area's legacy of industrial use, inadvertently entering a watercourse. The surface Water Monitoring Program Stations, sampled twice annually, will provide important chemical data from which a comparative analysis of the site's influence on surface Water regimes may be performed. Should the sampling results indicate that the undertaking is adversely influencing Water quality, the Board expects the Licensee to take remedial action.

The Water Management Plan also includes a sampling program for the Water Sources that will be utilized for dust suppression and spraying aggregate. Under this program the Licensee shall verify through sampling that the Water is uncontaminated before use.

Conditions related to monitoring are provided under Part J of the Licence. The Licensee should note that the Board adopted the sampling parameters suggested by the Licensee in the approved Soil and Groundwater Management Plan, and these are reflected under Part J, Items 7, 8, 10 and 12. However, where it saw fit, the Board added a number of additional parameters to better reflect and identify the characteristics of likely contaminant sources at the Iqaluit Airport Site.

NUNAVUT WATER BOARD
WATER LICENCE

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

ARCTIC INFRASTRUCTURE LIMITED PARTNERSHIP
(Licensee)

SUITE 5600, 100 KING ST W, TORONTO, M5X 1C9
(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use Water or dispose of Waste for a period subject to restrictions and conditions contained within this Licence renewal:

Licence Number/Type:	1BR-IIA1518 TYPE "B"
Water Management Area:	FROBISHER BAY WATERSHED (53)
Project/Location:	IQALUIT INTERNATIONAL AIRPORT IMPROVEMENT PROJECT (IIAIP), QIKIQTANI REGION, NUNAVUT
Classification:	INDUSTRIAL UNDERTAKING
Purposes:	USE OF WATER AND DEPOSIT OF WASTE
Quantity of Water use not to Exceed:	NINETY-FOUR (94) CUBIC METRES *PER* DAY
Date of Licence Issuance:	AUGUST 11, 2015
Expiry of Licence:	AUGUST 12, 2018

This Licence, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Thomas Kabloona
Nunavut Water Board, Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

a. This Licence allows for the use of Water, management of contaminated soil and Water, re-alignment of drainage ditches, installation of culverts, in-stream Water work, and long-term environmental monitoring at the Iqaluit International Airport Improvement Project, located approximately one (1) kilometre west of the City of Iqaluit, during an undertaking classified as Industrial as per Schedule 1 of the *Regulations* at the Iqaluit International Airport Improvement Project, within the Qikiqtani Region, Nunavut.

b. This Licence is issued subject to the conditions contained herein with respect to the taking of Water and the depositing of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the Nunavut Waters and Nunavut Surface Rights Tribunal Act, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be subject to such requirements; and;

c. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

In this Licence: **1BR-IIA1518**

"Act" means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*

"**Addendum**" means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report;

"**Amendment**" means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

"Analyst" means an Analyst designated by the Minister under Section 85 (1) of the *Act*;

''Appurtenant undertaking'' means an undertaking in relation to which a use of Waters or a deposit of Waste is permitted by a licence issued by the Board;

"Board" means the Nunavut Water Board established under the *Nunavut Land Claims Agreement*;

"Contact Water" means surface Water or runoff that is physically or chemically affected by a project's development areas and/or activities;

"Containment Cell" means the engineered containment structure designed to contain PHC and arsenic contaminated soils, as described in the Application submitted to the Board, April 21, 2015;

"Effluent" means treated or untreated liquid Waste material that is discharged into the environment from a structure such as a settling pond or following a treatment process;

"Engineer" means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act, s. Nu 2008, c.2* and the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

"Final Discharge Point" means the point at which the Licensee no longer exerts care and/or control over the quality and/or quantity of the effluent from a treatment process;

"Greywater" means all liquid Wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet Wastes;

"Hazardous Waste" means Waste classified as "hazardous" by Nunavut Territorial or Federal Legislation, or as "dangerous goods" under the *Transportation of Dangerous Goods Act* at the time of clean-up.

"**High Water Mark**" means the usual or average level to which a body of Water rises at its highest point and remains for sufficient time so as to change the characteristics of the land;

"Holding Basins" means the lined containment structures designed to hold Water suspected of contamination before testing and discharge, as described in the Application submitted to the Board on April 21, 2015;

"Inspector" means an Inspector designated by the Minister under Section 85 (1) of the *Act*;

"Landfarm Facility" means an engineered facility and associated appurtenance designed and constructed for the treatment and storage of hydrocarbon impacted soil and/or Water;

"Licensee" means the individual or organization to which Licence 1BR- IIA1518 Type "B" is issued or assigned;

"Maximum Average Concentration" means the average concentration of any four consecutively collected samples taken from the identical sampling location and taken during any given timeframe;

"Modification" means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

"Monitoring Program" means a monitoring program established to collect data on surface Water and groundwater quality to assess impacts to the freshwater aquatic environment of an appurtenant undertaking;

"Nunavut Land Claims Agreement" (NLCA) means the "*Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*," including its preamble and schedules, and any amendments to that agreement made pursuant to it;

"Quarry Pit" means the area of surface excavation for extracting rock material for use as construction materials in the development of infrastructure and facilities for the project;

"Regulations" means the *Nunavut Waters Regulations SOR 2013/69 18th April, 2013*;

"**Secondary Containment**" means an impermeable structure, external to and separate from primary containment, which prevents unplanned spills of hazardous materials and provides a minimum capacity of 110% of the original vessel. Where multiple vessels are stored within the containment, it must provide a minimum capacity equal to the sum of the largest vessel and 10% of the aggregate volume of all other vessels located in the containment. This structure shall also provide containment and control of hoses and nozzles;

"Sewage" means all toilet Wastes and greywater;

"Spill Contingency Plan" means a plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

"Sump" means an excavation in impermeable soil for the purpose of catching or storing Water or Waste;

"**Waste**" means, as defined in S.4 of the *Act*, any substance that, by itself or in combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means; and

"**Water**" **or** "**Waters**" means waters as defined in section 4 of the Act.

3. Enforcement

a. Failure to comply with this Licence will be a violation of the *Act*, subjecting the Licensee to the enforcement measures and the penalties provided for in the *Act*;

b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and

c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of Waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. The Water use fees, payable to the Receiver General for Canada, shall be sent to the Board annually for the right to the use of water in accordance with Section 12 of the Regulations.

2. The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported, which shall contain the following information:

a. The daily, monthly and annual quantities of cubic metres of Water obtained from all sources;
b. The daily Water flow volumes of any watercourse temporarily diverted during construction activities;
c. Tabular summaries for all data and information generated under the Monitoring Program and the results of any additional soil or Water sampling that occurred on-site (Including sampling results of Water Holding Basins);
d. A review and analysis of data generated under the Monitoring Program;
e. A summary of modifications and/or major maintenance work carried out on structures or facilities related to Water use or Waste management;
f. A summary of any abandonment and restoration work undertaken during the year and an outline of any work anticipated for the next year;
g. Any updates or revisions to plans *(*Including the *SGMP*) as required by changes in operation and/or technology;
h. A list of unauthorized discharges and summary of follow-up actions taken;
i. If applicable, a description of any trenches and sumps excavated, including the following: GPS coordinates, dimensions, depth below active layer, and secondary containment features;
j. A public consultation/participation report describing consultation with local organizations and the residents of the nearby communities;

k. A brief summary of work done to address concerns or deficiencies listed in the inspection reports and/or compliance reports prepared by an Inspector;
l. An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence; and
m. Any other details on Water use or Waste disposal requested by the Board by November 1st of the year being reported.

3. The Licensee shall notify the NWB of any changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.

4. The Licensee shall review the Plans referred to in this Licence, as required by changes in operation and/or technology, and modify the Plan accordingly. Revisions to the Plans shall be submitted in the form of an Addendum to be included with the Annual Report.

5. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.

6. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

7. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

8. The Licensee shall ensure a copy of this Licence is maintained at the site of operations at all times. Any communication with respect to this Licence shall be made in writing to the attention of:

(a) Manager of Licensing:
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca

(b) Inspector Contact:
Manager of Field Operations, AANDC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0

Telephone: (867) 975-4295
Fax: (867) 979-6445

9. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.

10. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the Board is received and acknowledged by the Manager of Licensing.

11. This Licence is assignable as provided for in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all Water for use in dust suppression and aggregate soaking from the Inner Field Ditch, southeast of Taxiway G, or the Backup Water Extraction Point, as described in the approved Water Management Plan. The maximum quantity of Water allowed for these purposes shall not exceed ninety-four (94) cubic metres per day.

2. The Licensee shall install flow meters or other such devices, or implement suitable methods required for measuring volumes of Water.

3. The Licensee shall equip all Water intake hoses with a screen of an appropriate mesh size to ensure that there is no entrainment of fish and shall withdraw Water at a rate such that fish do not become impinged on the screen.

4. The Licensee shall record the daily flow volumes of watercourses diverted for construction purposes as described in the Application, and report these volumes in the Annual Report.

5. The Licensee shall not remove any material from below the ordinary High Water Mark of any Waterbody unless authorized.

6. The Licensee shall not cause the obstruction of natural drainage, flooding or channel diversion except for the purposes as described in the Licence.

7. Sediment and erosion control measures shall be implemented prior to and maintained during the undertaking to prevent entry of sediment into Water.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall locate areas designated for Waste containment at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any Waterbody.

2. All Sewage and Non-hazardous solid Waste generated as a result of the undertaking shall be disposed of at an approved Waste disposal facility.

3. The Licensee shall dispose of all Hazardous Waste and Waste Oil at an approved Waste disposal facility.

4. The Licensee shall provide to the Board documented authorization from all communities in Nunavut receiving Wastes from the site prior to any backhauling and disposal of Wastes.

5. The Licensee shall maintain records of all Waste backhauled and records of confirmation of proper disposal of backhauled Waste and include this information within the Annual Report, under Part B, Item 2. These records shall be made available to an Inspector upon request.

6. The Licensee shall collect and temporarily store prior to sampling and any future disposal, in the Holding Basins as described in the approved Soil and Groundwater Management Plan, all Water derived from Quarry areas, excavation work, dewatering activities, Waste containment areas and any areas suspected of contact with contaminant sources.

7. The Licensee shall confirm that sampled Water associated with Monitoring Stations IIA-1, IIA-2, IIA-3 and IIA-4, as described in Part J of the Licence, does not exceed the following Effluent quality limits prior to use or being released to the receiving environment:

Parameter	Maximum Allowable Concentration of any Grab Sample (mg/L)
pH	6.5 to 9 (pH units)
TSS	50
Oil and Grease	15 and no visible sheen
Total Lead	0.001
Benzene	0.370
Toluene	0.002
Ethyl benzene	0.090
PAHs	CCME Guidelines[7]
Arsenic	0.05
Ethylene glycol	192
Propylene glycol	500

8. Effluent exceeding the limits set out in Part D, Item 7, shall be collected and treated or disposed of at an approved facility, or as otherwise approved by the Board]

9. The Licensee shall confirm, with an Inspector, the Final Discharge Point(s) for Effluent to be discharged from the Holding Basins containment structures described in Part D, Item 6 prior to any discharge into the receiving environment.

[7] CCME Water Quality Guidelines for the Protection of Aquatic Life

10. The Licensee shall provide at least ten (10) days written notice to the Inspector prior to any planned discharges from the Holding Basins, identified as Monitoring Station(s) IIA-1a-f, under Part J, Item 2. The notice shall include:

    a. Estimated discharge volume;
    b. Analysis results confirming discharge criteria are being met pursuant to Part D, Item 7; and
    c. Proposed location for the discharge.

11. For the purpose of treating Effluent quality criteria in Part D, Item 7, the Licensee shall not dilute Effluent with Water or any other Effluent prior to its discharge.

12. All pump-out Water from groundwater sampling activities shall be pumped to an area located at a minimum of thirty (31) meters from the ordinary high Water mark of any Waterbody and where direct flow into a Waterbody is not possible and no additional impacts are created.

13. The Licensee shall not deposit any Waste in any body of Water, or on the banks thereof.

14. The License shall not combine incompatible Waste types for the purpose of storage, shipment, buffering concentration of waste constituents or for any other purposes unless approved by the Board in writing.

PART E: CONDITIONS APPLYING TO CONSTRUCTION AND OPERATIONS

1. The Licensee shall submit to the Board for review, within ninety (90) days of completion of each engineered structure to contain, withhold, divert or retain Waters or Wastes during the undertaking, a Construction Summary Report prepared by a qualified Engineer(s), which shall include but is not limited to the following:
    a. All final design and construction drawings, stamped and signed by an Engineer;
    b. A summary of construction activities including photographic records before, during and after construction;
    c. As-built drawings;
    d. Documentation of field decisions that deviate from original plans and any data used to support these decisions; and
    e. Monitoring for sediment release from construction areas.

2. The Board has Approved the Soil and Groundwater Management Plan with Addendum, dated August 2014 and revised June 2015, including the following management plans:
    a. Environmental Impacts of Installation of Culverts, Construction or Modification of Drainage Ditches and Creation of Fish Habitat, October 2014;
    b. Erosion and Sediment Control Plan, Rev 1.0, July 2014;
    c. Hazardous Waste Management Plan, Rev 3.1., June 2015;

d. Contaminated Soil Management: Long-Term Monitoring Plan, Rev 3.4., June 2015;
e. Installation of Geomembrane Cover for Iqaluit Airport Hydrocarbon Contaminated Soils From the TC Landfarms and Arsenic Contaminated Soils, March 20, 2015;
f. Spill Contingency Plan, Rev. 1.1., June 2015;
g. Water Management Plan, Rev. 1.3., June 2015;
h. Remediation Work Plan Iqaluit Airport: Hydrocarbon Contaminated Soils from the TC Landfarms and Arsenic Contaminated Soils, Rev 1.1., August 2014;

3. The Licensee shall, through carrying out the Licence activities and upon discovering further sources of contamination not covered in the approved Soil and Groundwater Plan referred to in Part E, Item 2, submit to the Board, an addendum to the Plan to address the further remediation activities, for approval in writing prior to the commencement of remediation activities.

4. Quarrying activities shall be conducted in accordance with all applicable legislation, guidelines and industry standards including the *Northern Land Use Guidelines, Pits and Quarries* (INAC, 2009).

5. The Licensee shall maintain a minimum of thirty-one (31) metre undisturbed buffer zone between the periphery of Quarry sites and the ordinary High Water Mark of any water body unless otherwise approved by the Board in writing. The Licensee shall not excavate and/or remove material from any Quarry beyond a depth of one (1) meter above the ordinary High Water Mark or above the groundwater table, to prevent the potential contamination of groundwater unless otherwise approved by the Board in writing.

6. The Licensee shall locate all Equipment storage holding areas on gravel, sand or other durable land, a distance of at least thirty-one (31) metres above the ordinary High Water Mark of any waterbody in order to minimize impacts on surface drainage and Water quality.

7. The Licensee shall implement preventive and mitigation measures to prevent any chemicals, fuel or Wastes associated with the undertaking from entering any Water body.

8. The Licensee shall minimize disturbance to terrain, permafrost and drainage during movement of equipment and personnel around the site and undertake necessary corrective measures to mitigate impacts on surface drainage resulting from the Licensee's activities.

9. The Licensee shall prevent the deposition of debris or sediment into or onto any waterbody, as a result of construction or other earthworks. These materials, in addition to excavated and temporarily stockpiled materials, shall be disposed at a distance of at least thirty one (31) metres from the ordinary High Water Mark in such a fashion that they do not enter the Water.

10. The Licensee shall conduct all activities in such a way as to minimize impacts on surface drainage and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.

11. The Licensee shall not cut any stream bank or remove any material from below the ordinary High Water Mark of any waterbody.

12. The Licensee shall not cause erosion to the banks of any body of Water and shall provide necessary controls to prevent such erosion.

13. The Licensee shall maintain erosion and sediment control measures, as described in the approved Erosion and Sediment Control Plan, until all disturbed ground has been permanently stabilized, suspended sediments has resettled to the bed of the waterbody or settling basin and runoff water is clear.

14. All surface runoff from the construction activities where flow may directly or indirectly enter a Waterbody, shall not exceed the following Effluent quality limits:

Parameter	Maximum Average Concentration (mg/L)	Maximum Concentration of Any Grab Sample (mg/L)
Total Suspended Solids	50.0	100.0
pH	6.5 to 9	6.5 to 9
Oil and Grease	No visible sheen	No visible sheen

15. Machinery is not permitted to travel up the stream bed and fording of any waterbody is to be kept to a minimum and limited to one area and a one-time event.

16. The Licensee shall ensure that pollutants from machinery in or around Water do not enter Water.

17. The Licensee shall not utilize any equipment or vehicles in the course of this undertaking 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 shall cease if rutting occurs.

18. The Licensee shall not carry out in-Water work in fish-bearing Waters between September 1 and June 30 of any given year. The in-Water work restriction does not apply if the watercourse is frozen to the bottom, or if no Water is present.

19. The Licensee shall sample and provide, as part of its Annual Report, the results of any laboratory analyses carried out on fill material sourced from the Quarry, prior to use as construction materials. Quarry sources containing materials that possess acid generating and metal leaching characteristics cannot be used as construction materials.

PART F: CONDITIONS APPLYING TO DRILLING OPERATIONS

1. The Licensee is authorized to drill for the purpose of installing monitoring wells.

2. The Licensee shall restore all drill holes and disturbed areas to natural conditions upon completion of the project. The restoration of drill holes must include the removal of any drill casing materials and the capping of holes with a permanent seal.

3. The Licensee shall ensure that all drill waste, including water, chips, muds and salts (CaCl2) in any quantity or concentration, from land-based drilling, shall be removed from site for disposal, or disposed of in a properly constructed sump or an appropriate natural depression located at a distance of at least thirty-one (31) metres from the ordinary High Water Mark of any adjacent Water body, where direct flow into a Water body is not possible and no additional impacts are created.

PART G: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written consent from the Board, carry out Modifications to the approved Waste Management facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:

    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
    c. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    d. the Board has not rejected the proposed Modifications.

2. Modifications for which all of the conditions referred to in Part G, Item 1 have not been met can be carried out only with written approval from the Board.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Board has approved with the issuance of this Licence, the plan entitled Spill Contingency Plan, Rev. 1.1, dated June 2015, included in the Soil and Groundwater Management Plan referred to Part E, Item 2.

2. All sumps and fuel caches shall be located a minimum of thirty (31) metres above the ordinary High Water Mark of any adjacent waterbody and inspected on a regular basis.

3. The Licensee shall provide secondary containment for fuel and chemical storage as required by applicable standards and acceptable industry practice

4. The Licensee shall ensure that any equipment maintenance and servicing be conducted only in designated areas and shall implement special procedures (such as the use of drip pans) to manage fluids, Waste and contain potential spills.

5. If during the term of this Licence, an unauthorized discharge of Waste occurs, or if such a discharge is foreseeable, the Licensee shall:
   a. Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to AANDC's Manager of Field Operations at (867) 975-4295; and
   b. Submit to the AANDC Water Resources Inspector on each occurrence, a detailed report including the GPS location, no later than thirty (30) days after initially reporting the event.

6. The Licensee shall, in addition to Part H, Item 5, regardless of the quantity of releases of harmful substances, report to the NWT/NU Spill Line if the release is near or into a Water body

PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board, for approval in writing, an Abandonment and Restoration Plan at least six (6) months prior to abandoning any facility for Water or Waste management, or upon submission of the final design drawings for the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:

   a. Reclamation objectives;
   b. Petroleum and chemical storage areas;
   c. Any site affected by Waste spills;
   d. An implementation schedule;
   e. Maps delineating all disturbed areas, and site facilities;
   f. Stream crossings;
   g. Consideration of altered drainage patterns;
   h. Type and source of cover materials;
   i. Future area use;
   j. Quarry Closure;
   k. Hazardous Wastes; and
   l. A proposal identifying measures by which restoration costs will be financed by the Licensee upon abandonment.

2. The Licensee shall submit a Remediation Report for Drum Cache 2, as described in the Application, to the Board for review within ninety (90) days following the excavation of contaminated material, detailing a summary of remediation activities, sampling results and

volumes of Waste shipped to an approved facility.

3. The Licensee shall complete all restoration work for temporary structures and earthen work related to Water and Waste management, not included under Part I, Item 1, prior to the expiry of this Licence.

4. The Licensee shall complete all restoration work within the time schedule specified in the Plan, or as subsequently revised and approved by the Board.

5. The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.

6. The Licensee shall remove from the site all site materials not needed for the long-term operation of the site, including all fuel caches, drums, barrels, unused buildings and contents, Water pumps and lines, construction material and equipment prior to the expiry of this Licence.

7. In order to promote growth of vegetation and the needed microclimate for seed deposition, all disturbed surfaces shall be prepared by ripping, grading, or scarifying the surface to conform to the natural topography.

8. The Licensee shall contour and stabilize all disturbed areas to a pre-disturbed state upon completion of work.

PART J: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall undertake monitoring activities in accordance with the approved Water Management Plan, and Contaminated Soil Management Long Term Monitoring Plan, as described in Part E, Item 2, and revisions to the Monitoring Plans as approved by the Board.

2. The Licensee shall undertake the Monitoring Program and maintain the Monitoring Stations at the following locations:

Monitoring Station ID	Description	Frequency	Parameters
IIA-1a	Discharge Points for Holding Basins (as required and confirmed with Inspector)	Once per discharge, before discharge occurs	Volume Quality
IIA-1b			
IIA-1c			
IIA-1d			
IIA-1e			

IIA-1f			
IIA-2	Inner Field Ditch Point 1 Water Source	Daily, monthly yearly (Quantity) Beginning of season and monthly (Quality)	Volume Quality
IIA-3	Inner Field Ditch Point 2 Water Source	Daily, monthly yearly (Quantity) Beginning of season and monthly (Quality)	Volume Quality
IIA-4	Backup Water Extraction Point	Daily, monthly yearly (Quantity) Beginning of season and monthly (Quality)	Volume Quality
IIA-5	Carney Creek Upstream Project Area	Twice annually (Beginning and end of construction season)	Quality
IIA-6	Start of Inner Field Drainage Ditch	Twice annually (Beginning and end of construction season)	Quality
IIA-7	Carney Creek Downstream Project Area	Twice annually (Beginning and end of construction season)	Quality
IIA-8	Inner Field Ditch Downstream Project Area	Twice annually (Beginning and end of construction season)	Quality
IIA-9	Southern Inner Field Downstream Project Area	Twice annually (Beginning and end of construction season)	Quality
IIA-10	Groundwater monitoring station located beside and northwest of Containment	Annually (August)	Quality

	Cell (MW1)		
IIA-11	Groundwater monitoring station located beside and northeast of Containment Cell (MW2)	Annually (August)	Quality
IIA-12	Groundwater monitoring station located beside and southeast of Containment Cell (MW3)	Annually (August)	Quality
IIA-13	Groundwater monitoring station located beside and southwest of Containment Cell (MW4)	Annually (August)	Quality

3. The Licensee shall confirm the locations and GPS coordinates for all Monitoring Program Stations referred to in Part J, Item 2 and any additional stations with an Inspector.

4. The Licensee shall describe in all monitoring requirements for Monitoring Stations IIA-10, IIA-11, IIA-12 and IIA-13, whether the station is up-gradient or down-gradient of the Containment Cell.

5. The Licensee shall measure and record, in cubic metres, the daily, monthly, and annual quantities of Water extracted for all purposes at Monitoring Program Stations IIA-2, IIA-3 and IIA-4.

6. The Licensee shall monitor compliance with respect to Part D, Item 7 by collecting grab samples, representative of the total volume of Effluent to be discharged from the Water containment structure at monitoring station(s) IIA-1a-f.

7. The Licensee shall sample at Monitoring Stations IIA-1a-f, at minimum, once prior to each batch discharge event, and analyze for the following parameters:

pH
TSS
Oil and grease
Benzene
Toluene
Ethylbenzene
PAHs
Arsenic
Ethylene glycol
Propylene glycol
Total metals

8. The Licensee shall sample before construction activities commence annually, and monthly thereafter until freeze up at Monitoring Program Stations IIA-2, IIA-3 and IIA-4, and analyze for the following parameters:

Total Petroleum Hydrocarbons	Ethylene Glycol
Propylene Glycol	Polycyclic Aromatic Hydrocarbons
Benzene, Toluene, Ethylbenzene, Xylene	Arsenic
pH	Total Lead

9. Upon commencing construction activities every year, the Licensee shall not utilize Water from Monitoring Stations IIA-2, IIA-3 or IIA-4 until the results from the first sampling event have verified compliance, and henceforth the use of Waters from the non-compliant source shall cease immediately should subsequent sampling indicate non-compliance to Part D, Item 7.

10. The Licensee shall sample twice annually, once prior to and once near the end of the construction season, at Monitoring Program Stations IIA-2, IIA-3, IIA-4, IIA-5, IIA-6, IIA-7, IIA-8 and IIA-9, and analyze for the following parameters:

Total Suspended Solids(TSS)	Total Cadmium
Total Copper	Total Chromium
Total Iron	Total Lead
Total Mercury	Total Nickel
Total Zinc	Total Phosphorous
Total Aluminum	Total Manganese
Total Cobalt	Total Arsenic
Ethylene Glycol	Propylene Glycol
Biological Oxygen Demand (BOD_5)	pH
Total Petroleum Hydrocarbons (TPH)	
Polycyclic Aromatic Hydrocarbons (PAH)	
Benzene, Toluene, Ethylbenzene, Xylene	

11. The Licensee shall sample annually during August at Monitoring Program Stations IIA-10, IIA-11, IIA-12, and IIA-13, and analyze for the following parameters:

PHC Fractions F1-F4	BTEX
Arsenic	

12. The Licensee shall sample upstream and downstream of the Installation of the Arch Culverts and the new fish habitat, before and after construction occurs for the following parameters:

Total Petroleum Hydrocarbons (TPH)	Ethylene Glycol
Benzene, Toluene, Ethylbenzene, Xylene	Total Suspended Solids (TSS)
Propylene Glycol	Biological Oxygen Demand (BOD_5)
Polycyclic Aromatic Hydrocarbons (PAH)	Total Metals and Arsenic

13. The Licensee shall submit any changes or updates to the Plans referred to in Part J, Item 1, as addendums, together with the Annual Report for the year in which the changes occurred, to the Board for approval in writing.

14. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by a laboratory certified by the Canadian Association for Laboratory Accreditation (CALA).

15. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

16. The Licensee shall submit to the Board for review within ninety (90) days of Licence issuance, a stand-alone QA/QC Plan including a signed cover letter from a CALA accredited laboratory indicating acceptability of the Plan, which encompasses sample collection, storage, transportation and testing required to undertake the Monitoring Program.

17. The Licensee shall review the QA/QC Plan referred to in this Part as required by changes in operation and/or technology and modify the Plan accordingly. Revisions to the Plan are to be submitted in the form of an addendum to be included with the Annual Report, accompanied by a signed letter of approval from a CALA accredited laboratory, unless directed otherwise by the Board.

18. The Licensee shall conduct visual geotechnical monitoring of the containment cell containing contaminated soils. The monitoring shall be conducted by an engineer at the frequency indicated in the "*Contaminated Soil Long Term Monitoring Plan*", Rev. 3.4, June 2015 and approved by the Board in this Water Licence.

19. The Licensee shall submit to the Board, within the Annual Report required by Part B, Item 2, a report of the Engineer's Inspection carried out under Part J, Item 18. The Report shall include a cover letter from the Licensee, outlining an implementation plan to address the recommendations of the Engineer.

20. The results of the Monitoring Program shall be included in the Annual Report submitted to the Board under Part B, Item 2.

21. An AANDC Inspector may impose additional monitoring requirements.