IQALUIT INTERNATIONAL AIRPORT IMPROVEMENT PROJECT
Iqaluit, NU - Canada

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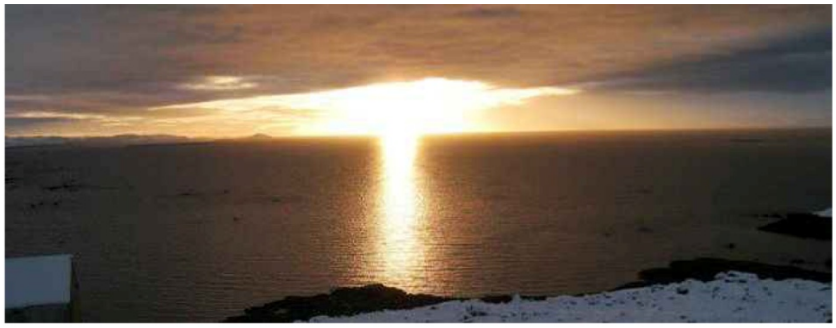

ORIGINATOR

ARCTIC INFRASTRUCTURE LIMITED PARTNERSHIP

TITLE

Nunavut Water Board Annual Environmental Report 2015

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REV	DESCRIPTION OF CHANGES	PAGE/SECTION	DATE
0	First Issue	All	20160331

The following files are attached to the report as Appendices:

A. Qikiqtaaluk Environmental_2015 Cell Cover Report
B. AILP_2015 Daily Water Consumption from IIA-2
C. EPA_Monitoring Water Quality - Stream Flow
D. AILP_2015 Carney Creek Water Flow Monitoring
E. Qikiqtaaluk Environmental_2015 Sampling of Soils in Containment Cell
F. Qikiqtaaluk Environmental_2015 Soil Test Results Drum Cache 2
G. Qikiqtaaluk Environmental_2015 Water Quality Monitoring
H. Qikiqtaaluk Environmental_2015 Monitoring Wells Report
I. Qikiqtaaluk Environmental_2015 Construction of Holding Basins
J. City of Iqaluit_2015 Records of Confirmation of Proper Disposal of Backhauled Wastes
K. Qikiqtaaluk Environmental_2015 QA-QC Procedures for Sampling Program

Contents

1. SUMMARY

In 2015, Arctic Infrastructure Limited Partnership obtained a type B Nunavut Water Board water licence for the implementation of the Iqaluit International Airport Improvement Project (IIAIP). This annual report logs actions and procedures that followed the licence released on August 11th, 2015 by the NWB to AILP: first, the temporary cover of the impermeable containment cell enclosing petroleum hydrocarbons and arsenic impacted soils was partially covered with a more permanent and durable geomembrane. This work is to be completed in the summer of 2016; secondly, water consumption, as described under the licence, secured from one source at the inner-field of the airport, amounted to 2,928 m^3 for the months of August and September. The water was used on Site for spraying over aggregates (to reach engineering specifications) and dust suppression; thirdly, water flow of the diverted Carney Creek was measured and results are presented in this report; fourthly, soil sampling found that the first 40 cm of the containment cell materials were not contaminated and that the no. 2 Drum Cache (footprint of the projected Taxiway F) revealed excess levels of Nickel and Ethylbenzene. Those contaminants are currently confined in two newly constructed holding basins as described in the initial licence; fifthly, water samplings performed on the Site showed that the Project did not affect the water bodies with contaminants. Lastly, internal audits were performed to improve the application of the licence's requirements by the management of wastes within the City of Iqaluit. All petroleum contaminated materials, other than aggregates, were shipped down South.

Improvements needed for 2016 are the completion of the cell cover and a more thorough training on spill events. AILP believes that the water use and wastes management are well under control within the licence conditions which are further described in this report and supported by the associated appendices.

2. 1BR-IIA1518 ANNUAL REPORT LICENCE CONDITIONS

2.1. Timetable Update - NWB Water Licence Type B #1BR-IIA1518

A timetable forecast was sent through electronic messaging to the Nunavut Water Board on September 9th, 2015. An official update of this timetable with the actual dates of completion is presented here:

	FORECAST		ACTUAL	
	Start	Finish	Start	Finish
Arch Culvert Geomembrane Installation	29/08/15	15/10/15	31/08/15	07/10/15
Water diversion at Carney Creek	28/08/15	28/09/15	31/08/15	07/10/15
Holding Basins installation (No. 1 and 2)	26/08/15	04/09/15	26/08/15	21/09/15
Taxiway F decontamination (ship hazardous material down South to approved facility)	11/09/15	22/09/15	11/09/15	ONGOING
Monitoring wells installation	18/09/15	22/09/15	24/09/15	24/09/15
Water Samplings for Water extraction	14/08/15	03/09/15	14/08/15	03/09/15
Monitoring for well sampling	27/09/15	27/09/15	27/09/15	27/09/15
Water sampling for Arch Culvert	16/08/15	16/08/15	16/08/15	21/10/15
Water sampling upstream and downstream	16/08/15	16/08/15	16/08/15	06/10/15
Containment Cell Cover replacement	16/10/15	21/10/15	22/10/15	ONGOING

Table 1: Timetable Update – NWB Water Licence Type B #1BR-IIA1518

2.2. Soil and Groundwater Management Plan (SGMP) Updates

Updates have been made to the *Specifications for Cell Cover Plan* (Appendix A.) In short, the temporary cell cover was replaced with a durable geomembrane. It was secured in placed with a combination of heavy objects and it is considered adequate for the purpose of preventing water from entering the containment cell. Some minor patches which do not affect the integrity of the new cover were not completely installed due to very low temperatures. The installation will be completed in the summer of 2016 at which time the integrity of the cell will be verified by our environmental consultant. The full report can be found in Appendix B.

No other updates were brought to the SGMP and its associated plans which include:

- Spill Contingency Plan;
- Hazardous Waste Management Plan;
- Water Management Plan;
- Long-term Monitoring Plan;
- Erosion and Sediment Control Plan; and
- Environment Impacts Plan.

2.3. Water Use

2.3.1. Daily, Monthly and Annual Quantities of Water Obtained from All Sources

Water used during the 2015 construction season for the civil component of the International Iqaluit Airport Improvement Project was in majority consumed from the Iqaluit airport extraction location IIA-2.

Please find here the water use summary Table for the 2015 Iqaluit International Airport Improvement Project. The total consumption of water from the identified source is equal to 2,928 m^3 over a period of 40 days. Details of the daily consumptions can be found in the report enclosed in Appendix B.

Month	Quantity (m^3)	Source
August	1824	IIA-2
September	1104	IIA-2
TOTAL	2928	IIA-2

Table 2: Quantities of cubic metres of water obtained from source under the licence

2.4. Water Flow

2.4.1. Daily Water Flow

Daily water flow diverted at the Carney Creek level was estimated and recorded with a Water Quality EPA calculation (Appendix C). In summary, the water flow was recorded between August 31st and October 6th, 2015 with an average of 6600 m^3/day. Results can be found in the report enclosed in Appendix D.

2.5. Monitoring Program

2.5.1. Soil Sampling

2.5.1.1. Containment Cell

The soil sampling part of AILP's water licence monitoring program was completed over the containment cell on October 24th, 2015. All-in-all, the analytic results of the 17 field samples (plus two duplicates) were found not to be impacted by contaminants of the licence guideline levels. These samples were retrieved in the top 0.40 m of the containment cell materials; by extension the top materials contained in the cell should not be considered contaminated. This conclusion and the subsequent recommendation can be found in the report enclosed in Appendix E.

2.5.1.2. Drum Cache 2 (Taxiway F)

Soil sampling was also performed in two stock piles of the area of the Drum Cache no. 2 (Taxiway F). Nickel for one pile and Ethylbenzene in the other pile did not respect the guideline levels. For this reason those two piles were transferred in the two newly constructed holding basins for further management (please see report enclosed in Appendix F).

2.5.2. Water Sampling

Water sampling was performed by the environmental consultant Qikiqtaaluk Environment Inc. Results from the water quality monitoring program show that the construction activities did not bring an adverse effect to the water (please see the summary of the results in the Table below and the report enclosed in Appendix G).

All 4 monitoring well samplings respected all guideline values provided in the Project's water licence (please see the summary of the results in the Table below and the report enclosed in Appendix H).

Monitoring Station	Description	Sampling Frequency (date)	Quality (samples exceeding licence thresholds)	
IIA-1a; IIA-1b; IIA-1c; IIA-1d; IIA-1e; IIA-1f	Discharge Points for Holding Basins	NO DISCHARGE under the licence	NOT APPLICABLE	
IIA-2	Inner Field Ditch Point 1 Water Source	2015-08-14	Metals (Al, Cu, Fe, Pb and Zn), Fluoranthene, Pyrene, Triethylen Glycol	
		2015-09-03	Metals (Cu, Pb and Zn), Triethylen Glycol	
IIA-3	Inner Field Ditch Point 2 Water Source	2015-08-14	Metals (Al, Cu and Fe)	Volume of water use: 2,928 m^3
		2015-09-03	Metal (Cu) and Toluene	
IIA-4	Backup Water Extraction Point	2015-08-14	None*	
IIA-5	Carney Creek Upstream Project Area	2015-08-16	None*	
		2015-10-06	Aluminium	
		2015-10-21	None*	

Monitoring Station	Description	Frequency (date)	Volume and Quality
IIA-6	Start of Inner Field Drainage Ditch	2015-08-16	Metals (Cu and Fe)
		2015-10-06	Metals (Al, Cu and Fe)
IIA-7 (*ARCH BL)*	Carney Creek Downstream Project Area	2015-08-16	Copper
		2015-10-06	Metals (Al, Cu and Fe)
		2015-10-21	Zinc
IIA-8	Inner Field Ditch Downstream Project Area	2015-08-16	Metals (Al, Cu, Fe and Zn)
		2015-10-06	Metals (Cu, Fe and Zn)
IIA-9	Southern Inner Field Downstream Project Area	2015-08-16	Metals (Cu and Fe)
		2015-10-06	Metals (Cu, Fe and Zn)
IIA-10	Groundwater monitoring station located beside and northwest of Containment Cell (MW1)	2015-09-27	None*
IIA-11	Groundwater monitoring station located beside and northeast of Containment Cell (MW2)		
IIA-12	Groundwater monitoring station located beside and southeast of Containment Cell (MW3)		
IIA-13	Groundwater monitoring station located beside and southwest of Containment Cell (MW4)		

*Note: Respected all guideline values provided in the Water Licence for the project 1BR-IIA1518

Table 3: Water Quality Monitoring Program Results

2.5.3. Water Holding Basins Sampling

Two holding basins built on the inner-field premises (please see report enclosed in Appendix I) were utilised for impacted soils containment that pertained to the Drum Cache no. 2 (reference: 1BR-IIA1518 *SGMP*). No water sampling was performed to this date since the soil froze shortly after its introduction into the basins. If liquids are present, water will be sampled and once the basins content melted.

2.5.4. Review and Analysis of data generated under the Monitoring Program

Data from the Monitoring program found in this report was reviewed and analyzed by all AILP parties. A copy of the data was provided to the Government of Nunavut.

2.5.5. Summary of any Abandonment and Restoration Work

No abandonment or restoration work was completed in 2015.

2.5.6. Updates or Revisions to Plans

As previously commented in section 2.1

2.5.7. List of Unauthorized Discharges and Summary of Follow-up Actions Taken

At our knowledge, no unauthorized discharges occurred in 2015 on the IIAIP.

2.5.8. Description of any Trenches and Sumps Excavated

No trenches and sumps were excavated in 2015.

2.5.9. Public Consultation and Participation Report

No public consultation and participation report in 2015.

2.5.10. Brief summary of Work Done to Address Concerns or Deficiencies

An internal audit on the NWB water licence compliance was completed by AILP and reported to the Government of Nunavut in October. Regarding the outcome of the audit, a more specific training for employees and secondary containments for some very small fuel portable containers are to be addressed in 2016.

2.5.11. Any other Details on Water Use or Waste Disposal

No additional details on water use or waste disposal.

2.6. Plans review

At our knowledge, no changes in operation and technology that would require review of any plans.

2.7. Records of all Waste Backhauled and Records of Confirmation of Proper Disposal of Backhauled Waste

Please find in Appendix J the disposal records for backhauled wastes to the Iqaluit municipality waste disposal site. Also, the following Table describes the types of waste that were hauled to the landfill. Any contaminated soil or material have been or will be shipped down south.

Waste Type	Volume (m^3)	Date
General Garbage	28	September 23rd, 2015
Wood	8	October 6th, 2015
Wood + Metal + Garbage	60	October 10th, 2015
Wood	14	October 13th, 2015
General Garbage	10	October 15th, 2015

2.8. Fill Material Laboratory Analysis

No laboratory analysis was required for the use of fill material before or during the project. The construction material is extracted from a neighbouring foothill which does not contain any clay.

2.9. Changes or Updates to the Plans Referred to in Part J of the c*onditions applying to the licence monitoring program*

No changes or updates to the plans referred to in part J of the *1BR-IIA1518* NWB type B Water Licence.

2.10. QA/QC Plan

Qikiqtaaluk Environment Inc. plan for quality assurance and control (QA/QC) is presented in Appendix K. There have been no updates to the document since 2015.

2.11. Report of the Engineer's Inspection Carried Out Under Part J, Item 18

The containment cell cover replacement is to be completed in the summer of 2016. Therefore, after completion, AILP shall conduct the monitoring of the containment cell according to the *Contaminated Soil Long Term Monitoring Plan*, Rev. 3.4, of June 2015.