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Questions and Comments

**Innavik Hydroelectric Project  
by the Pituvik Landholding Corporation**

**File 3215-10-005**

**August 2018**

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## GENERAL COMMENTS

This document includes a third series of questions and comments addressed to Pituvik Landholding Corporation as part of the review of the impact assessment of the Innavig Hydroelectric Project in Inukjuak.

## GENERAL CONTEXT

### QC - 3.1. RQC2-1 and Appendix RQC2-1

The Developer indicates that the main dam will have a maximum height of 16.4 m at the diversion structure and a retaining capacity in the order of 7.0 to 7.5 Mm<sup>3</sup> as a function of the headpond's normal projected tidal range (44.0 m to 44.6 m). These two parameters make this structure a high-capacity dam as defined by the *Dam Safety Act*.

- a. Consequently, construction of such a dam will be subject to authorization under Article 5 of the *Dam Safety Act* and Article 57 of the *Dam Safety Regulation (RSB)*.

RQC – 3.1. A request for authorization will be submitted at a later time.

### QC - 3.2. RQC2-1 and Appendix RQC2-1

According to the current dam configuration, it appears that a freeboard of barely 10 cm would be maintained between the crest of the main dam (46.4 m) and the water level reached during a 1,000-year flood (46.3 m). Unless the main dam is deemed not to be prone to crest erosion, the RSB stipulates that a minimum freeboard of 1 m should be considered for a safety check flood unless the Developer demonstrates that the hydrological, hydraulic and dam management uncertainties have been taken into consideration in establishing the safety check flood. In the absence of more substantial justifications, a freeboard of 10 cm does not appear to be acceptable within the meaning of the RSB.

- a. The Developer shall thus present strong arguments that justify such a freeboard, or otherwise present the alternatives that have been studied to increase this freeboard at the main dam during a 1,000-year flood. The Developer shall indicate the technical, environmental and monetary constraints, if any, of each of the alternatives studied, while taking into account current uncertainties with regard to climate change. In this regard, the Developer shall explore the possibility of increasing the dam's spillway capacity, raising the dam crest or using the diversion channel as a spillway in an extreme flood situation.
- b. In a 1,000-year-flood situation, the Developer shall also indicate whether there are any low points around the periphery of the headpond where the latter could overflow and indicate whether any particular measures are necessary to ensure that the headpond is contained.

### RQC – 3.2.

- a. The Developer intends to meet RSB requirements and ensure an appropriate freeboard by raising the dam to 47.3 m (Article 25 of RSB) to prevent erosion of the crest. This adjustment will cause minimal modifications to the dimensions of the dam: its length will be increased by less than 10 m on the right bank, while its maximum width over its full height will be increased by less than 3 m. These modifications will have no impact on the characteristics of the headpond, which remain unchanged with a normal operating level of 44.0 m.

The visual simulation of the project provided earlier (Appendix RQC2-1) will be updated in the next few weeks. It will be submitted to the Ministry as soon as it is available.

- b. In our verifications, we analyzed rising headpond levels of up to 2.0 m beyond the normal operating level. The headpond overflow remains in check. No specific measures are anticipated.

### QC - 3.3. RQC2-1 and Appendix RQC2-1

- a. **With regard to the preceding question, the Developer shall indicate how frequently structure monitoring activities will take place in accordance with the RSB, notably during flood periods.**
- b. **It shall also indicate whether or not the inspector is anticipated to permanently reside in Inukjuak in order to ensure prompt response, should it be needed. The qualifications of the inspector shall meet RSB requirements in this regard, notably in terms of reconnaissance visits.**
- c. **If appropriate, the Developer shall also discuss the possibility of installing instrumentation at the dam, notably in order to continuously and remotely monitor the headpond level.**

### RQC – 3.3.

- a. It is currently assumed that the dam is Class C. Reconnaissance visits will be made twice a year by the plant operator under the supervision of the engineer responsible for the safety of the Developer's dams.
- b. The resident operator will be trained to conduct this type of surveillance and ensure prompt response. The frequency of visits will be adjusted as a function of flooding intensity and climate conditions.
- c. It is already planned to install water level gauges to continuously monitor the flow and level of the river for production purposes. Additionally, surveillance cameras will be installed for security and monitoring purposes. The Developer does not plan to further instrument the dam to monitor its behaviour, though technical monitoring of

movements and leaks could be discussed in the meantime with the designer of the structure.

#### **QC - 3.4. RQC2-1 and Appendix RQC2-1**

**Monitoring of the Inukjuak River hydrological regime is a concern given that few hydrometric data are available. In this regard, the Developer has reached an agreement with the Direction de l'expertise hydrique (DEH) of the Quebec Ministry of Sustainable Development, Environment and the Fight against Climate Change (MDDELCC) for the installation of a gauging station on the Inukjuak River that can provide real-time data. Installation and operation of this device is expected to take place in the fall of 2018 and will help refine certain design parameters, both for temporary work as and for permanent facilities.**

- a. The Developer shall integrate these new data at the detailed engineering stage and ensure that such data are appropriately monitored.**

RQC – 3.4.

- a. We are taking note of this comment. The objective of installing the gauging station was to be able to use these new data.

#### **QC - 3.5. RQC2-1 and Appendix RQC2-1**

**The Developer shall provide the maximum operating level of the project, ideally accompanied by an ArcGIS file.**

RQC – 3.5.

During normal operations, the highest level will be 45.2 metres; an ArcGIS file was transmitted to Ms. Isabelle Auger, project manager at the MDDELCC's branch responsible for the environmental assessment of Northern and mining projects.

#### **QC - 3.6. RQC2-1 and Section 2.6 of Appendix RQC2-1**

**The Developer presented an updated schedule; however, the latter is no longer current.**

- a. The Developer shall present a new update of the project schedule. In preparing the said schedule, the Developer shall bear in mind the time required to obtain an authorization under the *Dam Safety Act*. The Developer shall also take into consideration the necessary authorizations under Title I (formerly Chapter I) of the *Environment Quality Act*, notably for the operation of borrow pits, installation of a temporary camp with an accommodation capacity of 128 persons, as well as the installation of temporary drinking water supply infrastructure.**

RQC – 3.6.

- a. Please find attached hereto as Appendix 1 the preliminary construction schedule. An updated list of required authorizations as well as the expected dates for obtaining such authorizations is presented in Table 1.

**Table 1 - Permits Required for Innavik Hydroelectric Project in Inukjuak**

<b>Authority</b>	<b>Permit or Authorization</b>	<b>Date of Application</b>	<b>Expected Date to Receive</b>
Kativik Environmental Quality Commission <i>(Environment Quality Act, Section 200)</i>	Decision transmitted to Minister	February 2010	December 2018
Ministry of Sustainable Development, Environment and the Fight against Climate Change <i>(Environment Quality Act, Section 201)</i>	Certificate of authorization for project implementation	N/A	January 2019
Ministry of Sustainable Development, Environment and the Fight against Climate Change <i>(Environment Quality Act, Section 22)</i>	Certificate of Authorization – Construction (including geotechnical work planned for wetlands or aquatic areas, construction of water crossings, plant and dam infrastructure, power lines, substation (25 kV transformer), temporary cement concrete plant, quarries and borrow pits, the work camp and waste management)	January 2019	April 2019
Ministry of Sustainable Development, Environment and the Fight against Climate Change <i>(Environment Quality Act, Section 31.75)</i>	Authorization for removal of ground or surface water for the production of cement concrete, use as a dust suppressant or for cleaning equipment	January 2019	March 2019
Ministry of Sustainable Development, Environment and the Fight against Climate Change <i>(Environment Quality Act, Section 32)</i>	Authorization for water purification and wastewater treatment at work camp	January 2019	March 2019

Authority	Permit or Authorization	Date of Application	Expected Date to Receive
Ministry of Sustainable Development, Environment and the Fight against Climate Change ( <i>Dam Safety Act</i> , Section 5)	Authorization	January 2019	April 2019
Pituvik Landholding Corporation (Under Titre IV of the <i>Act respecting the land regime in the James Bay and New Québec territories</i> , Section 116)	Water power lease ( <i>bail de location des forces hydrauliques</i> )	January 2019	April 2019
Pituvik Landholding Corporation (Under Titre IV of the <i>Act respecting the land regime in the James Bay and New Québec territories</i> , Section 116)	Right to occupy water property ( <i>droit d'occupation du domaine hydrique</i> )	January 2019	April 2019
Pituvik Landholding Corporation (Under Titre IV of the <i>Act respecting the land regime in the James Bay and New Québec territories</i> , Section 116)	Lease for project infrastructures	January 2019	February 2019
Pituvik Landholding Corporation (Under Titre IV of the <i>Act respecting the land regime in the James Bay and New Québec territories</i> , Section 116)	Lease to mine surface mineral substances ( <i>bail d'exploitation de substances minérales de surface</i> )	January 2019	April 2019
Kativik Regional Government	Certificate of Compliance	January 2019	March 2019

Authority	Permit or Authorization	Date of Application	Expected Date to Receive
Northern Village of Inukjuak	Development permits for projects on Category I lands	January 2019	March 2019
Northern Village of Inukjuak	Authorization for extraction of natural material on Category I Lands	January 2019	March 2019
Northern Village of Inukjuak	Permit for worker camp (within municipal boundaries)	January 2019	March 2019
Department of Forests, Wildlife and Parks <i>(Act respecting the conservation and development of wildlife)</i>	Authorization not required for activities in wildlife habitat (fish habitat) following delivery of a certificate of authorization under Chapter 201 of EQA	N/A	N/A
Department of Forests, Wildlife and Parks <i>(Sustainable Forest Development Act)</i> or Kativik Regional Government	Intervention permit for public utility works	January 2019	April 2019
Fisheries and Oceans Canada <i>(Fisheries Act)</i>	Authorization for any activity that might cause serious harm to fish	September 2017	September 2018
Transport Canada <i>Navigation Protection Act (R.S.C., 1985, c. N-22)</i>	Email regarding exemption from the Navigation Protection Program	June 2018	June 2018
Canadian Environmental Assessment Agency	Letter regarding exemption from the <i>Canadian Environmental Assessment Act (CEAA 2012)</i>	N/A	July 17, 2012

Modernization of the *Environment Quality Act*: Designation of the authorizations delivered and the sections of the laws and regulations from which they stem will be updated when required, following the entry into force of the provisions of the *Act to amend the Environment Quality Act to modernize the environmental authorization scheme and to amend other legislative provisions, in particular to reform the governance of the Green Fund* (2017, Chapter 4) (Bill n° 102) and the *Act respecting the conservation of wetlands and bodies of water* (2017, Chapter 14) (Bill n° 132).



### **QC - 3.7. Map of Project Infrastructure**

According to the maps and plans provided, the demarcation of the borrow pits does not seem to have taken into consideration the minimum distance of 75 metres from watercourses and water bodies, as stipulated in the *Regulation respecting pits and quarries*.

- a. For each of the borrow pits, the Developer shall indicate the minimum distance from a watercourse or water body.
- b. For each of the borrow pits, the Developer shall indicate whether compliance with the minimum distance of 75 metres from watercourses or water bodies is possible. If not, it shall justify its needs and assess the specific impacts by taking into account the nature of the material to be extracted as well as the impacts on the local environment and the fauna that use it.
- c. The Developer indicates that it will discuss the terms of restoring these quarries and borrow pits given that material availability is an issue in Nunavik. The Developer shall specify what it means by this statement and the options that it is considering.

### **RQC – 3.7.**

- a. In the maps and plans provided by the Developer, the borrow pits were located less than 5 m from a watercourse and approximately 7 m from a water body. However, in order to comply with the *Regulation respecting pits and quarries*, the Developer adjusted the boundaries of the borrow pits. The updated map of the project infrastructures is provided in the pocket insert.
- b. The Developer intends to comply with the minimum setback of 75 m from watercourses and water bodies and has adjusted the demarcation of each of the borrow pits accordingly.
- c. Since the Developer will obtain the authorizations to operate the borrow pits from Pituvik and the Northern Village of Inukjuak, it is anticipated that these parties will be consulted in order to understand their needs. In conclusion, the decision to close or maintain the borrow pits lies with the aforementioned parties.

### **MATERIAL AND EQUIPMENT TRANSPORT AND STORAGE**

#### **QC - 3.8. Impact Assessment, Section 6.3.2.2, Appendix RQC2-1, Section 2.6 and Appendix RQC2-7, Section 13.2**

In the February 2010 impact assessment, the Developer indicates that "all machinery and material needed for construction of the planned hydroelectric project would be transported by boat from the St. Lawrence Valley to the wharf in Inukjuak. After construction has been completed, the machinery would be shipped back to its point of origin."

- a. **The Developer shall indicate whether all barge transport will originate from the St. Lawrence Valley or if shipping is also planned out of communities located on the shores of James Bay. In the latter case, the Developer shall indicate out of which community barge transport will originate and explain its choice.**
- b. **The Developer shall also indicate the type of goods that will be transported by barge and other means of transport that are being considered, if any, for other project-related goods or components.**
- c. **The Developer shall indicate whether any facilities or infrastructure will need to be built or upgraded in the community(ies) of origin or in Inukjuak with regard to barge shipping (e.g. berthing site, storage, etc.).**
- d. **With regard to barge transportation, the Developer shall indicate whether agreements have been signed or are due to be signed with the local authorities.**

RQC – 3.8.

- a. All marine transportation is planned to take place out of James Bay, specifically from existing facilities in the Cree village of Wemindji. This site was selected as a shorebase for shipping via James Bay due to the presence of a reloading area, an existing dock that had been installed and operated by a shipping company with a barge and a rather deep draft capable of accommodating a tugboat. The Cree village of Wemindji is also the northernmost site accessible by road, which limits the distance to be travelled by boat.
- b. It is expected that the following goods will be transported by barge:
  - Construction machinery
  - Cement
  - Steel structures
  - Tool container
  - Construction material such as wood, concrete, concrete admixture, etc.
  - Turbines, generator, electrical equipment
  - Oils and other petroleum products for vehicle maintenance
  - Utility poles
  - Electric cables
  - Sheet piling
  - Waste
  - Propane
  - Temporary concrete batch plant

Other goods will be flown in.

- c. According to the Contractor's assessment, the existing infrastructure for maritime transportation is adequate and thus no construction or upgrades to the latter are anticipated either in Inukjuak or in Wemindji.
- d. The Contractor is in discussions with the community of Wemindji in an effort to reach an agreement to use the latter's port infrastructure. A final agreement will be reached following confirmation of the signature of the construction contract. Authorization to use the wharf in Inukjuak has been confirmed by Pituvik Landholding Corporation.

## **LEGAL FRAMEWORK**

### **QC - 3.9. RQC2-3**

**Table 1 presents the applicable laws and regulations in the context of the Innavig project.**

- a. **The Developer shall ensure that it takes into account the *Act respecting the conservation of wetlands and bodies of water*, adopted on June 16, 2017.**

RQC – 3.9. We are taking note of this comment.

## **FLOODING**

### **QC - 3.10. RQC2-10**

**The Developer indicates that the headpond located upstream of the dam will be filled slowly. The risk of shoreline erosion (and associated increase in turbidity) is expected to be low due to the presence of bedrock that will form the perimeter/shoreline of the pond. One area on the right shoreline of the headpond (currently a low marshy area) will be actively monitored during headpond filling to ensure that water quality does not deteriorate due to suspended sediment.**

- a. **The Developer shall discuss mitigation measures that it might use to limit the amount of fine particles entering the headpond when the latter is filled, such as removing the top layer of vegetation/soil, using turbidity curtains, etc.**
- b. **The Developer shall also discuss the anticipated impacts, if any, of flooding on the permafrost.**

RQC – 3.10.

- a. The Developer has undertaken to implement mitigation measures to limit the influx of fine particulate matter into the Inukjuak River during the construction phase, including when the headpond is filled. Filling the headpond slowly represents a first mitigation measure. This approach will help limit the amount of suspended organic material and fine particulate matter. The turbidity curtain would be used in a complementary

manner and as an additional precautionary measure to retain fine particulate matter within a defined space, such as the marshy area, and for a sufficiently long period that most suspended particles will resettle. This is the approach currently preferred by the Developer. Additionally, water quality will be continually monitored during the construction phase using a monitoring system installed downstream of the construction sites that can notably be used to measure turbidity (see RQC – 3.25).

Removing the top layer of vegetation and soil represents a major intervention in riparian environments, with repercussions on the nature and stability of soils and heightened risk of a significant inflow of particulate matter into the water. The Developer is currently assessing the advantages and disadvantages of such an intervention.

- b. Filling the headpond could cause partial thawing of the permafrost. This potential impact on the soil was taken into account when designing the project structures.

### **QC - 3.11.RQC2-10**

**In Answer RQC2-12 of the second series of questions and comments (document dated November 2016), the Developer indicates that for the different scenarios considered, the headpond filling time will vary between 2 and 3.4 days.**

- a. The Developer shall indicate whether a filling scenario has been selected. If so, the Developer shall present this scenario. If not, the Developer shall present the various fill scenarios under study and discuss their feasibility from technical, economic, and environmental perspectives.**

RQC – 3.11.

The Developer understands that the Minister is referring here to RQC12-C of the first series of questions.

The fill scenario has not been decided; however, the scenarios were presented on page 16 of the Questions and Answers document to the first series of questions in November 2016 (RQC12-C) and are reiterated below:

- Scenario 1: Allowing a minimum flow of 73 m<sup>3</sup>/s, which is the Q90 for November (i.e. the flow with a 90% probability of exceedance in November).
- Scenario 2: Allowing a minimum flow of 32 m<sup>3</sup>/s, which corresponds to the mean low flow in winter (see Table 6.4 of the EIA).
- Scenario 3: Allowing a minimum flow of 50 m<sup>3</sup>/s, i.e. an intermediate flow in between the two preceding values.

These various headpond filling scenarios are currently being studied in greater detail in order to determine which one is the most appropriate from technical, economic and environmental perspectives.

Fill time, which will depend on the flow of the Inukjuak River, will vary between 2.6 and 3.4 days.

#### **QC - 3.12.RQC-12-C and RQC2-10**

In the November 2016 document presenting responses to questions and comments, the Developer indicates that it has considered various headpond filling scenarios, namely Scenario 1, which stipulates a minimum flow of 73 m<sup>3</sup>/s, Scenario 2, which stipulates a minimum flow of 32 m<sup>3</sup>/s and Scenario 3, which stipulates a minimum flow of 50 m<sup>3</sup>/s. However, in the November 2017 document of responses to questions and comments, the Developer does not indicate which scenario has been retained. Nevertheless, in Section 12.2.3 of Appendix RQC2-7, it is indicated that a minimum flow of approximately 10 m<sup>3</sup>/s would be maintained during the construction period.

- a. **The Developer shall indicate the minimum flow that will be maintained during the construction period, notably during the headpond filling phase, and specify how this flow will allow fish habitat to be maintained in this section of the river.**
- b. **If the final choice of the headpond filling scenario is not known, the Developer shall discuss the different scenarios under study in terms of the minimum flow to be maintained, fill time, and the time of year for filling the headpond. When analyzing the different scenarios, the Developer shall also take into account fish habitat integrity and the biological cycles of the fish species present.**
- c. **In relation to the preceding question, the Developer shall indicate whether it will maintain a minimum flow during periods of maintenance.**

#### RQC – 3.12.

- a. No specific minimum flow will be maintained during the construction period. When the cofferdam is in place, the flow of the river will fluctuate as a function of the natural flow of the Inukjuak River. As mentioned in Section 6.1.2.2.1 of the Impact Study (page 53), particular attention was paid when designing the diversion channel in an effort to maintain natural water levels upstream of the planned cofferdam for all flows corresponding to the diversion period in order to avoid altering flow conditions in areas likely to be used by spawning coregonids and salmonids.
- b. The fill scenario has not been decided. The scenarios under study are discussed in RQC – 3.11. Fish and fish habitat will be taken into consideration in the comparative analysis of these scenarios.
- c. No specific minimum flow will be maintained during maintenance periods.

**QC - 3.13. Impact Assessment, Sections 6.1.2.2.2 and 6.2.2.2.2 and Appendix RQC2-7, Section 12.2.3**

In the February 2010 impact assessment, the Developer indicated that it did not plan to maintain a minimum flow during the project's operation phase. Thus, the hydrological and hydraulic conditions of the approx. 300 m section between the dam and the tailrace of the plant would have been modified. It should be noted that the Developer had planned to carry out projects to compensate for the loss of potential spawning habitat for lake whitefish and brook trout identified in this sector.

However, in the feasibility study, i.e. Appendix RQC2-7, it is indicated that even if the Developer decided to maintain a minimum flow of 10 m<sup>3</sup>/s during the operation phase, basic energy needs would be met throughout the service life of the project.

- a. In light of the foregoing, the Developer shall indicate whether it plans to maintain a minimum flow for fish habitat during the project's operation phase. If so, it shall indicate the minimum flow value or minimum flow regime that will be maintained at all times. It shall also specify whether this flow will allow fish habitat integrity in this section of the river to be maintained, notably while taking into account the fish species present and the types of habitats observed in this section of the river. If the Developer does not plan to maintain a minimum flow during this period, it shall justify its decision.
- b. The Developer shall also indicate whether it is planned to maintain a minimum flow for esthetic purposes. If so, it shall indicate and justify the value of this minimum flow. If not, the Developer shall explain its decision.

RQC – 3.13.

- a. The Developer does not plan to maintain a minimum flow during the operation phase of the planned run-of-the-river power plant. No flow or water level control structure is anticipated. Flow below the dam will fluctuate as a function of the natural flow of the Inukjuak River.

Table 2 below presents an estimate of the use of the spillway throughout the year as a function of the river flow. Water from the Inukjuak River will flow via the spillway an average of 296 days per year. The average monthly flow will vary between 1.0 and 180.2 m<sup>3</sup>/s.

**Table 2 - Estimate of Spillway Use During Operation Phase**

Month	Average Number of Days per Month		Average Flow in Spillway [m <sup>3</sup> /s]
	With Spillway Discharge	Without Spillway Discharge	
January	31	0	17.8
February	21	7	7.0
March	16	15	3.2
April	6	24	1.0
May	11	20	21.8
June	27	3	180.2
July	31	0	165.6
August	31	0	106.2
September	30	0	79.4
October	31	0	82.0
November	30	0	73.1
December	31	0	40.0
<b>Total</b>	<b>296</b>	<b>69</b>	<b>-</b>

Fish habitat in the section of Inukjuak River between the dam and the outlet of the tailrace will be modified. A portion of this section (totalling 4,652 m<sup>2</sup>) will be permanently exposed between the dam and the spillway outlet. Maximum exposure will be observable during the winter low flow period when all water from the Inukjuak River will pass through the plant's turbines and none will be discharged via the spillway. According to Table 2, such a situation could arise an average of 69 days a year. In this situation, the maximum surface area exposed would total 36,954 m<sup>2</sup> between the dam and the tailrace outlet. The rest of the year, the extent of the exposed area will vary from season to season as a function of the natural flow of the Inukjuak River.

The section of the Inukjuak River that will be exposed corresponds to a sector of rapids and riffles with a lotic flow of whitewater over a substrate of bedrock and boulders. According to the fish community and habitat characterization study, this section of river could be used as a feeding grounds by brook trout and potentially ouananiche.

The Developer maintains its commitment to carry out projects to offset any modification to fish habitat and will do so in consultation with various local stakeholders (Uumajuit warden, municipality, etc.).

- b. No minimum flow for esthetic purposes will be maintained during the operation phase. Flow below the dam will fluctuate as a function of the natural flow of the Inukjuak River.

## **SOCIAL ASPECTS**

### **QC - 3.14.RQC2-15**

**The Developer indicates that it will create a follow-up and cooperation committee as soon as the construction phase commences. The mandate of this committee will be to ensure that the development, construction and operation of the run-of-the-river plant is carried out in a spirit of cooperation with the host community. It is also indicated that the committee could be composed of representatives of the Northern Village of Inukjuak, the Uumajuit warden (KRG), Pituvik Landholding Corporation, the Inukjuak Hunting, Fishing and Trapping Association, the Hunters and Trappers Committee Association, and Innergex.**

- a. The Developer shall indicate whether one or more residents (not holding any political office) of the Northern Village of Inukjuak will also sit on the follow-up and cooperation committee.**

### **RQC – 3.14.**

- a. Indeed, it is possible that one or more residents of the village of Inukjuak could participate in the follow-up and cooperation committee. Sharing regular updates on the construction process and keeping the community informed is very important to the Developer. The follow-up and cooperation committee will include individuals from the community who do not hold any political office. The Developer would notably like to see an elder and a woman on this committee to represent the community.

### **QC - 3.15.RQC2-16**

**The Developer indicates that in order to prepare a land use description and an evaluation of the project's impacts, it has taken into consideration all information collected in the context of the impact assessment. The Developer also indicates that it has met with the community on several occasions and that additional initiatives have been taken with the Nunavik Marine Region Planning Commission in order to complete the land use characterization with the data compiled by this organization.**

- a. The Developer shall indicate whether or not, in order to provide added value to this information, it has consulted with the Inukjuak Hunting, Fishing and Trapping Association, the Hunters and Trappers Committee Association or other associations or groups of hunters, trappers, fishermen or partakers in other traditional activities such as berry or medicinal plant gathering.**
- b. The Developer shall also indicate whether it is considering implementing any mitigation measures related to the practice of traditional activities.**

RQC – 3.15.

- a. Meetings with representatives of the hunting, trapping and fishing communities will be held in the fall of 2018. Minutes of these meetings will be submitted to the Ministry as soon as they are available.
- b. The presence of machinery and road upgrades will trigger temporary traffic interruptions at certain sections of existing roads, e.g. for culvert upgrades, blasting, etc. However, these interruptions will be short-lasting and will not hinder access to the area. In the event of a temporary closure of an access road, members of the community would be informed beforehand, notably by means of the local radio. Additionally, a bridge will be installed to provide access across the river during construction. In the context of consultations with the Northern Village of Inukjuak, the community requested that the bridge remain permanently installed post construction for use by the community, thereby providing the latter with access to hunting and fishing grounds across the river.

**QC - 3.16. RQC2-17 and Section 2.4 of Appendix RQC2-1**

**During the construction phase, which is expected to last approximately three years, it is estimated that a number of workers will be required, a large proportion of whom will be from outside of Nunavik. In this context, a temporary work camp would be erected north of the community of Inukjuak. Notwithstanding the positive impacts associated with hiring a number of worker, as presented by the Developer in the impact assessment, the latter does not seem to mention any potential adverse social impacts that might arise following the mass arrival of workers from outside the region hosting the project. These impacts can concern the project host community and/or the hired workers themselves and members of their families, notably due to the distance of their homes and "fly-in / fly-out" work practices.**

- a. The Developer shall thus present its analysis of the potential social impacts of its project stemming from the significant arrival of workers from outside the region and, as the case may be, present any mitigation measures that it intends to implement to curb the potential impacts identified in the said analysis.**
- b. The Developer shall indicate the measures that it will implement to ensure that workers from outside the region will respect the culture of the host community, particularly its concerns related to sexual abuse as well as drug and alcohol use.**

RQC – 3.16.

- a. No negative impacts to the community are anticipated. All workers will live in the camp, which is located close to the airport. The camp is self-sufficient and will offer all the necessary amenities for resident workers, who will work 28 days followed by 14 days off. The work period will be for 28 consecutive days of full-time work. In their time off, workers will be free to travel to the village and make any necessary purchases or carry out errands. Three flights a week are planned, for a total of 30 workers travelling per week.

- b. The Contractor will implement a code of conduct (see Appendix 2: General Camp Rules) before workers begin travelling to Inukjuak. It will be acknowledged and signed by each employee. The code of conduct will stipulate disciplinary measures, including dismissal. The camp will be "dry", meaning no alcohol or drugs will be permitted. The Contractor will participate in meetings of the follow-up and cooperation committee organized by the Developer (RQC – 3.14 a.). Any complaint or concern will be properly addressed by this committee. The contractor will be in regular contact with the local police force.

**QC - 3.17. RQC2-17 and Section 2.4 of Appendix RQC2-1**

**The information presented on page 6 of the Addendum to the impact assessment indicates that construction work would require approximately 345,000 man-hours.**

- a. **The Developer shall also provide the number of workers that are expected to be hired during this period, both on average and at the peak of construction.**
- b. **Likewise, the Developer shall indicate the number of workers required in the operation phase.**
- c. **Moreover, for both phases, the Developer shall mention the targeted number of workers from within the community of Inukjuak and from Nunavik and indicate whether or not quotas are planned for local and regional hiring. It shall also specify whether it intends to ensure equity between Inuit and non-Inuit workers in terms of the salaries and benefits offered. The Developer shall specify whether work schedules and working conditions will be able to be adapted to the reality of Inuit workers and whether or not the latter will have the same access to accommodations or the work camp as non-Inuit workers.**
- d. **The Developer shall indicate whether it will give precedence to contracting with Inuit-owned companies whenever applicable.**

**RQC – 3.17.**

- a. On average, 40 workers will be present at the work site during construction. In the peak period, i.e. in 2020 and 2021, 100 workers will be present at the work site.
- b. During the operation phase, 1 or 2 resident operators will be hired.
- c. The construction site is governed by the Commission de la construction du Québec (CCQ). As such, equity in wages and working conditions is mandatory in accordance with the law and the collective agreement. Priority will be given to hiring workers from Nunavik. There are no specific targets for workers from within the community of Inukjuak or from Nunavik as a whole. The contractor is in discussions with the Nunavik Nunavimmi Pigiursavik vocational training centre in an effort to recruit a number of apprentices in various fields. Following discussions with Pituvik Landholding Corporation, no particular working conditions or paid vacation different than those offered to non-local workers are required.

- d. For sub-contracted work, Nunavik-based businesses will be invited to submit quotes. Under the call for tenders, the same rules will apply to everyone. Companies that contribute to hiring their workforce locally will be given priority.

**QC - 3.18. RQC2-17 and Section 2.4 of Appendix RQC2-1**

- a. **Considering that the community of Inukjuak is a "dry" village, and in order to avoid exacerbating social problems related to alcohol abuse and contraband in the community, the Developer shall indicate whether the work camp will be drug- and alcohol-free.**
- b. **If so, it shall specify the particular measures that will be put into place to achieve this.**

RQC – 3.18.

- a. The community currently has regulation that allows a certain amount of consumption of alcohol. As mentioned in RQC – 3.16 b., the camp will be alcohol-free ("dry").
- b. The Contractor's camp will be drug- and alcohol-free (see Appendix 2: General Camp Rules).

**QC - 3.19. RQC2-17 and Section 2.4 of Appendix RQC2-1**

**During the construction phase, it is estimated that a number of workers will be required, a large proportion of whom will be from outside of Nunavik. The camp will be used essentially during periods of construction, which will extend over the course of three years.**

- a. **The Developer shall specify what it means by "construction seasons".**
- b. **It shall also indicate whether the fly-in / fly-out approach is favoured for workers from outside the Nunavik region. If so, the Developer shall specify, compared to the current situation, how many additional weekly flights are anticipated at the Inukjuak airport, including the transport of foodstuffs and other provisions for the work camp.**
- c. **The Developer shall also indicate whether the current airport infrastructure is sufficient to meet its needs or if upgrades are required.**
- d. **Additionally, the Developer shall specify whether current drinking water distribution and wastewater treatment infrastructure is sufficient to meet the needs of the community and the work camp, or if upgrades are required.**
- e. **The Developer shall specify the reasons for choosing to locate the work camp in proximity to the village of Inukjuak. The Developer shall mention whether location alternatives have been considered and, if so, justify the grounds on which they were accepted or rejected.**

## RQC – 3.19.

- a. The construction season will begin in May and will end in November.
- b. The project would increase airport traffic by 3 flights a week for workers (10 workers each), and 1 flight a week for material. Air transport will be out of the Québec City or Saint-Hubert airports. Foodstuffs would mostly be brought in by boat from the Cree village of Wemindji. Provisioning could possibly take place out of Val-d'Or in refrigerated containers. The Contractor owns an aircraft that will be dedicated to this project. To the extent possible, the Contractor will arrange with the local transporter to carry out tasks that the Contractor's aircraft is unable to perform.
- c. The existing airport facilities are sufficient for the project's needs.
- d. The municipality of Inukjuak has already confirmed that the existing facilities are sufficient to meet project needs in terms of drinking water and wastewater treatment. The Contractor will supply a truck and equipment to support the municipality in providing these services.
- e. The camp location was selected in collaboration with the Inukjuak municipality. Additionally, Pituvik preferred that the camp be located as close to the village as possible. It is the best location in this area. It provides the possibility to undertake its installation prior to starting any other work. It is close to a Hydro-Québec distribution line and thus permanent electrical service. Additionally, all municipal services are available in this area. The proximity to the airport offers better flexibility for the arrival and departure of workers to and from the airport. It is also more convenient. The camp location was validated on site in the summer of 2017 and does not encroach upon wetlands.

**QC - 3.20. RQC2-17 and Section 2.4 of Appendix RQC2-1**

**During the construction phase, which is expected to last approximately three years, it is estimated that a number of workers will be required, a large proportion of whom will be from outside of Nunavik.**

- a. **The Developer shall indicate whether it intends to support employees who wish to engage in fishing activities, e.g. making boats available to them, etc. It should be noted that fishing practiced within the jurisdiction of the community of Inukjuak is notably governed by regulations that are enforced by Pituvik Landholding Corporation.**
- b. **The Developer shall discuss how the presence of workers from outside the Northern Village of Inukjuak will impact fauna and traditional activities.**

RQC - 3.20.

- a. *Inuit have the exclusive right to hunt and fish in Category I and II lands. That is a right granted to the Inuit by the JBNQA and the Act respecting hunting and fishing rights in the James Bay and New Quebec territories (Q.R.S. c. D-13.1). Non-beneficiaries non-residents (sic) may access Category I lands, but are not allowed to exercise sport hunting or fishing activities on land designated as category I unless the concerned landholding corporation specifically and formally authorizes their sport activities. The corporation may attach conditions and fees to its authorization.*<sup>1</sup>

Thus, the Contractor does not intend to make watercraft available to workers.

- b. No additional impact is anticipated since Pituvik will be responsible for managing and authorizing hunting and fishing activities. In coordination with the owner, the Contractor will implement a buffer zone for hunting. Fauna is not expected to be impacted, as workers will not have any vehicles for their own personal use. A buffer zone will need to be established around the perimeter of the site during the construction period.

**QC - 3.21. RQC2-17 and Section 2.4 of Appendix RQC2-1**

**The Developer plans to construct a temporary work camp that can accommodate 128 workers for the three years that will be needed for construction. On Page 4 of the Addendum to the impact assessment, it is mentioned that "a portion of this camp might remain on the premises for future use."**

- a. **The Developer shall specify what kind(s) of use(s) are meant.**
- b. **The Developer shall specify the type of construction and whether this construction will be removable or permanent.**
- c. **The Developer shall indicate the site remediation or restoration activities that it intends to carry out, if any, during the partial or total demobilization of the work camp.**

RQC – 3.21

- a. The camp will be for temporary use. Since the Addendum was prepared, it has been agreed that the camp would be dismantled and shipped back to its point of origin. However, it is possible that bedroom units could be transferred to a village camp belonging to community members in order to increase their accommodation capacity.

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<sup>1</sup> NLHCA, [n.d.], *Hunting, Fishing and Trapping Rights*. Nunavik Landholding Corporations Association. Consulted at <http://www.nlhca.ca/HFTA> in July 2018.

- b. It is a temporary construction and is not designed for permanent use. The camp will be composed of removable individual mobile trailers.
- c. The decision whether or not to proceed with site remediation will be discussed with Pituvik in accordance with the said organization's needs for economic development projects. The camp will be completely removed only after construction has ended. As requested by Pituvik, it is anticipated that the camp site ground surface will be left as is. It can be used in the future for new construction or other needs by the community.

### **QC - 3.22. Section 3 of Appendix RQC2-1**

**Section 3 of the Addendum to the impact assessment, which pertains to the validation of impacts of the current project, seems to suggest that modifications to the landscape during the operation phase will be limited to the presence of the power line. However, clearly, the landscape will also be modified by the presence of all new infrastructure to be installed, e.g. power plant, dam, etc.**

- a. **The Developer shall revisit the impact assessment for its project with regard to the "landscape" component and ensure that all infrastructures are included.**

#### RQC – 3.22.

- a. The impact on the "landscape" component was assessed in the environmental and social impact assessment report submitted to the MDDELCC in February 2010; the assessment took all project infrastructures into consideration. The Addendum submitted by the Developer in November 2017 aimed to describe the project as it was being proposed in 2017 and to validate the environmental impact assessment. The project had been slightly modified to account for the economic context, optimize the design and functionality of the project, and take into consideration complementary environmental studies, notably with regard to wetlands. The main hydraulic criteria remain unchanged with respect to those presented in the impact study. The same holds true for project infrastructure (power plant, dam, etc.), meaning the 2010 assessment regarding the project's impact on the landscape remains valid. The visual simulation of the project included in Appendix B of the Addendum presents the layout of project infrastructure.

The table in the Addendum mentions only modification of the landscape due to the presence of the power line since it draws from the content of Tables 8.1 and 8.2 of the February 2010 impact study report (pages 113-115).

As a reminder, the conclusion of the landscape analysis reads (pages 104-105):

"Installation of the power line along the access road would also modify the landscape. However, electricity pylons and cables would not be elevated with respect to the valleys that characterize the contours of the natural landscape.

The presence of infrastructures would lead to a modification of the landscape. However, on account of the effort made to visually integrate infrastructures into the landscape, overall, no negative repercussions on landscape quality are anticipated."

## EMERGENCY ACTION PLAN

### QC - 3.23. RQC2-19 and Appendices RQC2-19.1 and RQC2-19.2

The Developer undertakes to produce a detailed emergency action plan for the construction phase only. For the operation phase, the Developer is expected to implement a corporate emergency situation management procedure based on the example of the one submitted in Appendix RQC2-19.2.

- a. The Developer shall produce two preliminary emergency action plans: one for the construction phase and one for the operation phase. These plans shall be submitted to the relevant emergency responders likely to provide support in the event of a disaster, notably those in the village of Inukjuak. They shall be sent to the ministries and organizations whose respective mandates cover emergency measures.
- b. Moreover, the emergency plan of the Kativik Regional Government (KRG) shall be harmonized with that of the dam manager. In order to ensure their effectiveness, these plans shall be updated regularly in the context of joint emergency measure preparation programs.
- c. The Developer shall also take into account the following points when developing its preliminary emergency action plans:
  - Only volunteer firefighters and first responders are continually present in the community;
  - The Inukjuak sector does not have a 911 protocol to establish an alert sequence as set out in Appendix 5 of Appendix RQC19.2;
  - Inukjuak's local emergency services can be reached at the following numbers:
    - Police: 819-254-9110;
    - Fire: 819-254-9000;
    - Health-related matters: 819-254-9090.
  - A disaster can also be reported by contacting the Centre des opérations gouvernementales (COG) at 1-866-650-1666, 24 hours a day, 7 days a week;
  - Given the presence of a large number of individuals on the work site during the construction phase, a multi-injury evacuation plan shall also be developed, notably in collaboration with local authorities.
- d. The Developer shall specify whether employees from the community of Inukjuak and other Nunavik communities will be required to undergo any particular training. If so, the Developer shall indicate who will be responsible for such training.

## RQC – 3.23.

- a. The Developer reiterates its commitment to produce a detailed Emergency Action Plan as part of its application for a certificate of authorization for construction of the Innavik Hydroelectric Plant. As for operations, the Developer reiterates the response provided in the second series of questions and comments (RQC2-19), whereby the Innavik Hydroelectric Plant will be subject to Innergex's management procedure for emergency situations. Preliminary studies have determined the risks associated with dam failure to be low, with no human fatalities and minimal economic losses. As per Article 40 of the Dam Safety Regulation, an Emergency Action Plan would not be required for operating dams for which the dam failure consequence category is "very low" or "low". In the event that this level is revised upwards, notably at the time of the request for authorization mentioned in RQC – 3.1, the Developer undertakes to submit a preliminary emergency plan for the operation phase of the Innavik Hydroelectric Plant.
- b. The Developer undertakes to harmonize emergency measures with the Kativik Regional Government (KRG).
- c. The Developer will take into account the items mentioned, notably the development of a multi-injury evacuation plan in collaboration with local authorities. This plan will be submitted to the Ministry as soon as it is available. Steps have already been taken with local authorities, notably the local health services. Furthermore, please note that the number to reach the police is in fact 819-254-9111.
- d. Regardless of where employees are from, they will be required to complete the same trainings notably to meet workplace health and safety standards. The Contractor will be responsible for providing these trainings.

**QC - 3.24. RQC2-19**

**The Developer indicates that preliminary studies have determined the risks associated with dam failure to be low, with no human fatalities and minimal economic losses.**

- a. The Developer shall provide these preliminary studies.**
- b. If necessary, the Developer shall also document the consequences of a dam failure, notably sharply rising water levels, public safety and impacts on existing infrastructure.**

## RQC – 3.24.

- a. The Developer does not have access to the preliminary studies mentioned in the feasibility study.
- b. The Developer will conduct its own dam failure study to confirm previous studies and the dam classification as part of the request for authorization under the *Dam Safety Act*. This study will be initiated in the fall of 2018.

## DRINKING WATER INTAKE

### QC - 3.25. RQC2-19

The Developer indicates that, during the construction phase, it plans to install a temporary water intake upstream of the construction work to avoid any potential for drinking water contamination for the village of Inukjuak.

The Developer shall provide further information on this temporary water intake. In this regard, the Developer shall specify:

- a. The planned location of the temporary water intake and the potential impacts associated with its installation and operation.
- b. Whether the latter will operate continuously throughout the construction phase, including the headpond filling period, or if it will operate only during the construction seasons (see QC3-19 a.).
- c. Whether the water intake will be connected to the current water intake or if water will be transported by tanker truck. Additionally, the Developer shall specify whether the Northern Village of Inukjuak plans to have additional vehicles on hand to transport water to the community.
- d. Whether water quality analyses additional to those already conducted (e.g. presence of contaminants such as hydrocarbons and increase in organic matter) will need to be performed or if the frequency of analyses will need to be modified during the construction and operation phases.
- e. Whether the temporary water intake could become a permanent intake in the event that water degradation is observed at the current intake location. If not, the Developer shall discuss the measures that it will implement in the event that water degradation is observed at the current water intake site.

### RQC – 3.25.

- a. It is planned to provide a temporary water intake (raft pumps), which would be located upstream of construction work in a bay at kilometre markers 10.5-11.0. A preliminary location is indicated in the infrastructure location map attached to this document in the pocket insert. A temporary access road will be built while making maximum use of existing roads and avoiding wetlands.

The Developer will work in close collaboration with the community of Inukjuak in order to minimize impacts in the event of deterioration of water quality downstream of the construction work. Additional trucks for transporting water will be made available to the village.

- b. The temporary water intake will be used only during construction seasons.

- c. It is not planned to connect the temporary water intake to the village's water intake. If necessary, a tanker truck and operator will be provided to compensate for the additional distance over which water must be transported. The village does not intend to increase the number of trucks. The Contractor will have one water truck available to help in specific situations should the municipality require assistance.
- d. During construction, water quality will be measured continuously and the frequency of analysis will be adapted to the level of risks and reviewed by the project team. Reports will be made available to the community.

A water quality monitoring system will be installed downstream of the construction site. The system will monitor water turbidity (amount of sedimentation in the water), oxygen content, and organic and inorganic spills stemming from rock excavation or construction equipment. Baseline figures for water quality of the Inukjuak River will be measured prior to construction. During operations, water quality will be monitored on a weekly basis.

- e. The water intake will be temporary rather than permanent. In the event that water quality is compromised and has the potential to affect human health or wildlife habitat, a Water Quality Remediation Plan will be triggered. The plan will be developed for review by the community. The Water Quality Remediation Plan will comprise a series of immediate actions that might include a water supply back-up plan, an approach to determine the source of the problem, as well as remediation measures to correct the situation and prevent the issue from recurring.

#### **QC - 3.26. RQC2-20**

**The Developer indicates that KRG will offer its support should a water quality issue arise.**

- a. **The Developer shall indicate whether KRG or the MDDELCC will be directly involved in coordinating the temporary water intake work and the monitoring to be implemented.**

RQC – 3.26.

- a. Indeed, the aforementioned parties will be involved.

#### **CARBON EXCHANGE**

#### **QC - 3.27. RQC2-21**

**Although the project seems to result in greenhouse gas (GHG) emission reductions relative to the baseline situation over the service life of the project, it is important to take into consideration the current context of new provisions being introduced by the bill amending the *Environment Quality Act* adopted on March 23, 2017.**

- a. **The Developer shall thus quantify the GHG emissions associated with the project's construction and operation phases, and identify appropriate**

mitigation measures that will help prevent, eliminate or reduce the main sources of GHG emissions during the aforementioned phases.

The Developer shall comply with the following procedure:

- Identify all project-related GHG emission sources, sinks and reservoirs (construction and operations);
- Quantify all project-related GHG emissions. For all project phases (construction and operation), determine annual GHG emissions by using recognized resources for such quantifications;
- Develop a mitigation measures plan to reduce the impacts of the project with regard to GHG emissions;
- Develop a GHG emissions monitoring and follow-up plan, especially with regard to emissions of SF6 and perfluorocarbons (PFC) during operations.

Examples of GHG emission sources that may be considered to be attributable to the project include but are not limited to the following:

- GHG emissions attributable to the use of stationary combustion equipment on the project site during the construction and operation phases;
- GHG emissions attributable to the use of mobile combustion equipment on the project site during the construction and operation phases;
- GHG emissions attributable to the transport of construction material;
- GHG emissions attributable to the transport of excavation and backfill material used during project construction;
- GHG emissions attributable to the use of electricity-producing generators during the construction and operation phases;
- GHG emissions attributable to the use of explosives;
- Fugitive GHG emissions from high-voltage electrical equipment (e.g. transformers containing SF6).

RQC – 3.27.

Project activities are likely to generate relatively low GHG emissions compared to other types of industries, for instance those involving a combustion process.

### **Quantification of Emissions**

Total GHG emissions from the project are estimated at 26,978 metric tonnes of CO<sub>2</sub> equivalent (hereafter, “t CO<sub>2</sub>-eq”) with estimated emissions of 21,538 t CO<sub>2</sub>-eq during the construction phase and an average of 136 t CO<sub>2</sub>-eq/year during the operation phase considering a period of 40 years (Table 3).

**Table 3 - Summary of Greenhouse Gas (GHG) Emissions for Innalik Project**

Project Phase	Estimated Annual GHG Emissions [t CO <sub>2</sub> -eq/year]	Number of Years	Estimated Total GHG Emissions [t CO <sub>2</sub> -eq]
Construction	5,385	4	21,538
Operations	136	40	5,440
Total	-	-	26,978

In any case, annual emissions will be well below the reporting threshold of 10,000 t CO<sub>2</sub>-eq stipulated in the *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere* (c. Q 2, r. 15). The project is not an emitter under Chapter 2 of the *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* (c. Q 2, r. 46.1).

The following sections describe the parameters considered in the estimate.

The high-level quantification of greenhouse gas emissions for the project's construction phase is provided in Table 4. The provided values are estimated using the resources identified for each emission source and are based on the nature, intensity and duration of the construction activities described. Given the absence of significant ground vegetation – which is typical for Nunavik's northern climate – the quantity of GHGs emitted by biodegradation in the construction phase will be negligible.

**Table 4 - Quantification of Greenhouse Gas Emissions – Construction Phase**

GHG emissions source associated with construction phase	GHG Emissions [t CO <sub>2</sub> -eq]	Resource used for quantification
Removal of vegetation	Negligible	Little ground vegetation; tundra.
Production and transport of aggregates; excavation, loading and backfilling operations	1,443	Greenhouse Gas Emissions Mitigation in Road Construction and Rehabilitation, Egis, 2010
Use of explosives	30	Average powder factor: 1 kg of explosive / m <sup>3</sup> of rock. AGO Factors and Methods Workbook, Australian Greenhouse Office, December 2006
Concrete production, mixing, transport and pouring	6,588	Canada's greenhouse gas inventory – Appendix C. The Greenhouse Gas Emission from Portland Cement Concrete Pavement Construction in China, <i>International Journal of Environmental Research and Public Health</i> , 2016
Transport of construction materials, fuel, provisions and workers	13,471	Fonds d'action québécois pour le développement durable (FAQDD), Calculateur des émissions de gaz à effet de serre (GHG emissions calculator), 2010

<b>GHG emissions source associated with construction phase</b>	<b>GHG Emissions [t CO<sub>2</sub>-eq]</b>	<b>Resource used for quantification</b>
		Research and Traffic Group, Environmental and Social Impacts of Marine Transport in the Great Lakes-St. Lawrence Seaway Region. Executive Summary, January 2013  Les émissions gazeuses liées au trafic aérien commercial en France en 2016, Ministry for an Ecological and Solidary Transition, 2017
Incineration of domestic waste	6	<i>Analyse des effets des activités de gestion des matières résiduelles sur les émissions de gaz à effet de serre</i> (available in English as <i>Determination of the Impact of Waste Management Activities on Greenhouse Gas Emissions</i> ): 2005 update, submitted to Environment Canada and Natural Resources Canada, ICF Consulting, 2005
<b>Total</b>	<b>21,538</b>	<b>t CO<sub>2</sub>-eq over 4 years of construction</b>
<b>Annual average</b>	<b>5,385</b>	<b>t CO<sub>2</sub>-eq/year</b>

The high-level quantification of greenhouse gas emissions for the project's operation phase is provided in Table 5. Decomposition of carbon present in organic soils represents the primary source of GHGs during the project's operation phase. GHG emissions associated with fuel use by vehicles and other mobile equipment during the operation phase is considered negligible. No fugitive greenhouse gas emissions are anticipated, notably from high-voltage electrical equipment. Such equipment will be maintained in good working order so as to avoid any release of GHGs into the atmosphere.

**Table 5 - Quantification of Greenhouse Gas Emissions – Operation Phase**

<b>GHG emissions source associated with operation phase</b>	<b>Average Annual GHG Emissions [t CO<sub>2</sub>-eq]</b>	<b>Resource used for quantification</b>
Molecular diffusion through air-water interface for those lands submerged by the headpond; decomposition of carbon present in organic soils (65 ha)	136	GIEC, <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i> , Volume 4, Agriculture, forestry and other land use, Appendix 2.6
Fugitive GHG emissions from high-voltage electrical equipment	Negligible	No fugitive emissions anticipated; equipment will be maintained in good working order
<b>Annual average</b>	<b>136</b>	<b>t CO<sub>2</sub>-eq/year</b>
<b>Total</b>	<b>5,440</b>	<b>t CO<sub>2</sub>-eq for 40 years of operation</b>

The following GHG emissions are excluded from the estimate due to the lack of data, the high variability thereof or the negligible contribution to the assessment:

- Emissions associated with the life cycle of construction materials, notably the production of steel and synthetic materials; and
- Motorized commuting of employees.

### **Mitigation Measures**

During the project construction phase and whenever possible, wood-based construction products will be given precedence over those made of steel, aluminum, concrete or similar materials. Wood is considered a more acceptable solution from an environmental perspective. To the extent possible, equipment used in project operations will be powered by hydroelectricity generated by the plant rather than GHG-emitting fossil fuels. The use of equipment and vehicles powered by fossil fuels will be minimized; idling of engines will also be avoided when equipment use conditions allow.

### **Monitoring and Follow-up**

High-voltage electrical equipment may contain gases used as electrical insulators that are potentially greenhouse gases. Electrical equipment will be maintained in good working order and inspected on a regular basis in an effort to avoid any release of these gases into the atmosphere. Whenever necessary, electrical equipment may be fitted with gas detectors so that any accidental leak of insulating gas may be rapidly identified and corrected. The Developer will ensure compliance with requirements applicable to the activities associated with the hydroelectric plant, including those that will enter into force from time to time throughout project operations.

## **CLIMATE CHANGE**

### **QC - 3.28. RQC2-22**

**The Developer shall ensure that it takes into account changes in the hydrological regime under current and future climate scenarios when planning and operating its project. Ouranos (2015)<sup>2</sup> presents an increase in total annual precipitation, as well as more intense and more frequent meteorological events for the Nord-du-Québec region. Additionally, the Quebec Department of Transport, Sustainable Mobility and Electrification of Transportation has a standard whereby flows are increased by 18% in order to account for the effects of climate change when designing culverts for watersheds of 25 km<sup>2</sup> and less.**

- Climate change impacts will have repercussions on the hydrological regime. With regard to the preceding questions and comments, the Developer shall ensure that these changes are taken into account in the infrastructure design.**

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<sup>2</sup> Ouranos (2015). Towards adaptation. Synthesis on climate change knowledge in Québec. 2015 Edition. Montréal, Quebec: Ouranos. 415 p.

RQC – 3.28.

- a. Indeed, the Developer will ensure that climate change is taken into account when designing the infrastructures.

## **FISH**

### **QC - 3.29. RQC2-28**

**The Developer indicates that a fish contamination monitoring program will be implemented to determine and monitor potential changes in mercury concentrations in fish tissue. Baseline fish tissue samples collected to date will be augmented by additional fish tissue sampling prior to the start of construction. Two fish species used as a food source by Inukjuak residents – lake whitefish and brook trout – will be the focus of the monitoring program.**

- a. **The Developer shall justify its choice of brook trout and lake whitefish as indicator species to monitor mercury levels in fish.**

RQC – 3.29.

- a. The Developer identified the lake whitefish and brook trout as indicator species, as these two species are relatively abundant in the study area and are targeted by fishermen in the community. Following recent discussions, it was decided to also include lake trout for monitoring, another species sought by local fishermen. The program for monitoring mercury contamination in fish will be developed in collaboration with community representatives. Additionally, the task of analyzing samples will likely be delegated to the Nunavik Research Centre, which is located in Kuujjuaq and operated by Makivik Corporation's Resource Development Department.

### **QC - 3.30. RQC2-28**

**The Developer mentions that "if necessary, [it will] formulate and communicate to the community of Inukjuak recommendations to limit consumption of certain fish species for certain size ranges."**

- a. **The Developer shall indicate the means it intends to employ to inform the population of monitoring that will be conducted and the results of such monitoring, and, as necessary, how consumption-related advisories might be communicated to the community.**
- b. **It should be noted that the Nunavik Regional Board of Health and Social Services requests to be consulted when health-related recommendations are being made.**

RQC – 3.30.

- a. Advisories will be made through public announcements on the local radio. The local radio is the most commonly used medium in the community to make public announcements. The follow-up and cooperation committee established prior to construction will also be informed of monitoring results.
- b. We are taking note of this information and will contact the aforementioned Board in the near future.

### **INFORMATION SUPPLEMENT – WASTE INCINERATOR**

As indicated in the Waste Management Plan (Appendix RQC2-24) and in the General Camp Rules (Appendix 2 herein), domestic waste generated by the camp and the construction site during the construction phase will be burned in an incinerator located on the premises of the camp.

Materials that will be burned include:

- Domestic waste (food scraps, food, food packaging, household waste);
- Formwork and other non-recoverable construction wood
- Shipping boxes and cardboard

The volume of waste to be eliminated in this manner is estimated at 150 kg per day.

The Contractor will obtain all required authorizations for this mobile incinerator, notably under Chapter 22 of the *Environment Quality Act*. Incinerator operation will be subject to Chapter III of the Regulation respecting the landfilling and incineration of residual materials (REIMR), i.e. Sections 121 to 135. The model and characteristics of the incinerator selected will be specified in the authorization applications. An example of a potential incinerator is presented in Appendix 3. In compliance with the REIMR, the incinerator in question will be at least a dual-chamber unit.

# ***Appendix 1***

**Innavik Hydroelectric Project**

**Preliminary Schedule**  
Project starting in 2019

**CRT Construction inc.**



Project: Innavik Proposition  
Date: Thu 18-06-28

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only		Manual Progress	
Summary		Inactive Task		Duration-only		Finish-only			



# ***Appendix 2***



# **INNAVIK HYDROELECTRIC PROJECT**

## **GENERAL CAMP RULES**

July 27, 2018  
Rev. 0

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- Appendix 3    Health Questionnaire

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**DEFINITIONS**

- CO : Camp Officer, CRT employee who is responsible of the camp management and all other services
- CRT : CRT Construction Inc., Project General Contractor

**CONDITIONS**

All workers and visitors of the Innavik Project will be provided with a copy of the “General Camp Rules” document. They will have to read it, accept the rules and sign it before getting the access. If the worker or visitor refuses to sign it, the access to the site will be denied.

I, \_\_\_\_\_, acknowledge having read and understood the “General Camp Rules” document for the Innavik Project and agree to respect all the rules. I understand that if I do not respect all the rules, I could be punished. I also acknowledge that any sanction given by the Project Manager or one of his representatives is final and that I will have to comply with it.

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Employee Name Printed Letters	Signature	Date: YY/MO/DD
----------------------------------	-----------	----------------

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Witness Name Printed Letters	Signature	Date: YY/MO/DD
---------------------------------	-----------	----------------

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## 1. FOREWORD

## 2. REGISTRATION AND ORIENTATION

### 2.1 UPON ARRIVAL

Upon arrival, **you are always required to register with the Camp Officer at CRT's office.** no matter if it's your first visit or not. On your first visit of the year, you will have to :

- Fill in your registration ;
- Fill in a medical questionnaire (see Appendix 3 Health Questionnaire to be filled in by all (Personnel) ;
- Attend an orientation meeting (only once a year),
- Get your room key (unless you are only visiting for the day) ;
- Receive a copy of the "General Camp Rules" and other relevant information.

If you are a worker coming back from time off or if you have been out of the camp for one night, you have to register again with the Camp Officer. This is important : we always need to know who is in camp in case of an emergency (fire, evacuation, etc.) You will also get back your key for your room.

### 2.2 UPON DEPARTURE

Before leaving the camp, **you have to come to CRT office and inform the Camp Officer of your departure.** You will have to give back your key, whether it is for a regular turn around or final leave. For a definitive departure, make sure you pick up all your personal belongings, including boots, shoes, hard hat and clothing.

### 2.3 PERSONAL BELONGINGS

Before leaving, make sure you gather all your personal belongings. If ever you leave personal belongings behind and want to retrieve them, CRT will send them at your fees at the indicated location (prepaid courier).

After informing you of the presence of your belongings, CRT will dispose of them if no action to recover them is done on your part.

## 3. ROOMS

Upon registration, you are assigned a room for the duration of your stay. If there is a problem with the room, please inform the Camp Officer of the situation. The Camp Officer will try its best to resolve the situation or assign you another room. You are not allowed to switch or to exchange room with other workers.

When your room is assigned, you are responsible for all personal belongings and material provided in the room by the CO (linen, towels, blankets, mattress, etc.). Upon final departure, all camp material must be left in the room. Fees will be applied for missing or damaged items.

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All assigned room is assumed to be in good condition upon registration. Please inspect your room and make sure everything is in order. Damages, breakage and deterioration not resulting from normal wear and tear will be charged to the occupant. The occupant will be responsible for repair costs.

In order to keep living clean, removed dirty boots and any soiled or wet clothing at the space provided at the camp entrance.

Occupants must keep their room in a normal state of cleanliness. Housekeeping services are provided. Rooms not tidy enough or excessively dirty due to the occupant carelessness will not be cleaned by housekeepers.

It is the responsibility of the occupant to keep the room locked at all times to prevent theft. Complaints about stolen belongings will be denied if the occupant has history of not locking their door. Housekeepers are instructed to lock room doors at all times.

Occupants must also ensure a way to keep their room key safe. **Lost keys incur a replacement cost of \$ 20. Occupants that lock themselves out regularly will be charged fees.**

It is forbidden to use without reasonable cause firefighting equipment, alarm system or any other equipment belonging to CRT available in the common areas.

Tranquility is always required in rooms. Noisy meetings, listening to music, movies, radio or television must be done in a way as not disturbing neighbours. **After 10 :00 PM**, all these activities must stop. Use of headphones is recommended.

Only authorized personnel can repair or modify mechanical components, the electrical system, heating system or fire protection system.

In order to protect the health and safety of all room occupants, **it is forbidden to:**

- Make modifications in the room without authorization ;
- Cook in rooms or other locations not designated or keep perishable food;
- Store food from the cafeteria or lunch room, except a reasonable amount of snack food (1 or 2 days supply) ;
- Store or use small electric appliances in rooms;
- Smoke in rooms or in indoor public locations (lunch room, hall way, etc.);
- Store flammable liquids (other than domestic) in rooms, below dorms or any other location near living quarters;
- Store tools or similar equipment in living quarters;
- Disconnect the fire alarm system;
- Use or move firefighting equipment unless it is an emergency;
- Spit on floors;
- Dispose of waste and garbage in hallways, toilets or outside.

All problems related to housing or safety system must be reported to the Camp Officer.

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CRT management has the right to enter any room at any reasonable hour for safety inspection, or to ensure compliance with camp regulations regarding alcohol or illegal drugs. In case of an emergency, CRT may enter any rooms at any time.

#### 4. BEHAVIOUR

The following behaviours are forbidden :

- Any behaviour, individual or collective, detrimental to the construction site and camp management;
- Anyone who disturbs the peace or cause disorder by his misconduct or that encourages or participates in a brawl is punishable under these regulations. The penalties may result in prosecution and eviction of the site;
- Trade, traffic or distribution of alcohol or illegal drugs as well as its use is prohibited throughout the site;
- Illegal drugs are defined as any drugs, narcotics or medication other than those prescribed by a physician or those that cannot be obtained in a pharmacy without a prescription;
- Keeping animals of any species;
- Feeding wildlife, voluntarily or not;
- Acts for which the law establishes criminal penalties as well as any attempt to commit such acts.

#### 5. ALCOHOL AND DRUGS

CRT prohibits the possession, the consumption, the distribution, the sale or the traffic of alcohol and drugs on camp and work site of Innavik Project.

The employee or the subcontractor will be denied access to the camp if the direction of CRT has reasonable grounds to believe that someone violates this rule.

#### 6. VEHICLES

All drivers must comply with road signals on site and Québec driving regulations and Project specified speed limits. All drivers and passengers must use seatbelts in all pick-ups, SUV's, vans, buses, trucks and all other similar equipment including heavy machinery. It is the driver's responsibility to make sure all passengers are buckled up before operating the vehicle.

All vehicles must be equipped with a mobile radio with at least the four (4) frequencies (channel) as stated in the contract. Radio communication must follow the radio protocol established by CRT for efficient radio communications and safe operation of machinery.

All drivers must comply with the speed limit of, at most, 40 km/h on site. All drivers must also comply with posted speed limits.

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All vehicles must be parked ready to go. At the camp site and when possible, park rear end first. Avoid parking too close to the building, and leave access to stairways and building entrances. Outside the winter, a no idling policy is enforced for environmental reasons.

No personal vehicle is authorized to be on site, only company's vehicle. Company vehicles must be clearly identified.

Drivers not complying with driving regulation will be subject to sanctions. Repeat offenders will be dealt with using the progressive disciplinary policy.

Driving under the influence of alcohol or illegal drugs, drinking while driving or passengers drinking are strictly forbidden. The offenders could be evicted from the site.

In case of an accident, a supervisor must be informed immediately. Injured personnel will be dealt with in priority and an accident investigation will take place. All accidents, incidents and close calls involving a vehicle must be reported as soon as possible to CRT Safety Manager.

CRT pick-ups are generally assigned to supervision or office staff. They are responsible for the proper maintenance of their vehicle, they must ensure it is kept clean and that all food waste, coffee cups and wrappers are disposed of properly at the end of each day. If the pick-up is not assigned, the last user of the day is responsible for performing those tasks. You will be held responsible for breakages in the pick-up if you do not report the condition of the vehicle before your shift.

All damages must be reported on the Daily Inspection Form. Drivers with two (2) passengers and more must fill out a Pre-Shift Inspection Form and bring it back to the office each day.

## 7. ORDER AND SECURITY

Good housekeeping should be a priority for all.

Order and cleanliness must be maintained at all times in order not to jeopardize the health, safety and welfare of persons working on construction sites as well as the quality of the environment.

Occupants must comply with the normal rules of personal hygiene and cleanliness. It is forbidden to wash clothes anywhere other than in the laundry rooms.

Each person has custody of his personal effects and remains responsible for any damage.

All postings must be approved by CRT, and it must be posted in the public section on billboards, so as to not interfere with mandatory and regulatory posting.

Smokers must comply with federal, provincial and CNESST Acts and Regulation and smoke only in designated areas, outside buildings.

All accidents (with or without personal injuries) incidents, spills, close calls) must be reported to the employer and to CRT'Safety Supervisor.

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## 8. PERSONNEL PROTECTIVE EQUIPMENT

All personnel must wear Personal Protection Equipment (PPE) at all times on site.

PPE includes steel-toe boots, hard hat, high visibility vest, safety glasses (these four (4) items are mandatory), hearing protection and gloves (generally optional, but required depending on environment and tasks to perform).

Exceptions:

- Personnel getting in and out of the camp (arriving/leaving) ;
- Workers not assigned to a construction site or activity (ex: kitchen staff) ;
- Workers around the camp site, outside working hours.

Workers wanting to take a walk around camp ending by walking on the main road should wear high-visibility vests.

## 9. SERIOUS OFFENCES

Besides the criminal prosecutions they may cause, the following offences are considered serious :

- Theft;
- Lewd acts and sexual aggression;
- Acts of aggression, intimidation or assault;
- Possession, consumption or sale of drugs;
- Trafficking, consumption or distribution of alcohol;
- Vandalism and destruction of equipment;
- Reckless behaviour involving your own life or that of others;
- Driving under the influence of drugs or alcohol;
- Unauthorized use of vehicles or equipment for personal use;
- Hunting, trapping or fishing/disturbing wildlife in any way/form or fashion;
- False identity;
- Bullying or Harassment (Sexual, physical, verbal, ethnic, due to religious or sexual orientation).

## 10. EMERGENCY PLAN

An emergency plan is implemented and updated with the progress of the work.

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## 11. FIRE PREVENTION

Smoking is not allowed inside any building on the construction site or at the camp site.

Smoking is allowed outside:

- In designated areas;
- Anywhere on the camp at least you are 9 m from any building, warehouse, tank.

Cigarettes butts should be thrown away cleanly and safely; they must be extinct!

It is forbidden to store combustible liquids in rooms (except domestic liquids), under dorms or trailers, or near living quarters.

In an emergency situation, follow directions given by CRT and gather at the nearest muster station.

In practice drills, you are required to participate and follow instruction given by CRT.

## 12. FAMILY PROBLEM, ACCIDENT OR SICKNESS

There is an emergency situation at home and someone needs to reach you?

Leave them this phone number: XXX XXX-XXXX. This is CRT main office number at Innavik Project.

Staff will do their best to reach you rapidly and give you the information.

Monday through Sunday

7:00 AM to 5:30 PM

Sunday

9:00 AM to 3:00 PM (Only if it is a work day)

You can also give them your personal email address. Internet is provided at no charge in camp.

You need to inform a relative that you are sick or injured?

It is your responsibility to update the emergency contact information you provided your employer with.

## 13. PENALTIES

Any deviation from the regulations is subject to a penalty of up to the offender being expelled from the site upon CRT or their representative's decision.

The penalty will be imposed according to the severity of the infraction. A repeat offender is likely to have a more serious penalty.

## 14. PUBLIC PHONES

Free phone service is provided to workers. Phones are located in the recreation area, in a local near \_\_\_\_\_.

Please use them responsibly.

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## 15. FOOD

The cafeteria schedule is: TO BE CONFIRMED

- Breakfast : 5.30 AM to 7.00 AM
- Lunch : 12.00 PM to 1.00 PM
- Dinner : 5.30 PM to 7.00 PM

Please, dispose of your tableware and silverware in the plastic bin provided.

Use the large can set aside for recycling water bottles and pop cans.

The lunch room is always open and you have access to snack foods, sandwiches and soft drinks in the refrigerators.

Please do not remove silverware and tableware (including mugs) from the cafeteria. Use paper cups and disposable containers and utensils located in the lunch room.

Reminder: you are not allowed to store food in your room as it attracts rodents and bears. You are limited to a one (1) or two (2) day supply of snack food.

## 16. WASTE MANAGEMENT

At Innavik Project, we do have four (4) different categories of waste :

- Domestic waste : leftover food, food packaging, general household waste;
- General construction waste : plastic wrapping, wood cut-outs, scrap, metal, etc.;
- Contaminated soil : soil that has been contaminated by oil, fuel, antifreeze;
- Contaminated waste : oil pails, grease tubes, aerosol cans, etc.

We do not mix different types of waste together. On the construction site, each type of waste has its own bin/container in which it is disposed of.

The recycling of water bottles and pop cans is done.

All the domestic waste generated by the camp and the site is burnt at the camp's incinerator.

All other waste will be disposed outside the camp.

Be sure to dispose your waste in designated containers. Domestic containers of the site and camp are kept indoors, away from bears. Do not leave any domestic waste in boxes of the pick-up. Cabs must be cleaned daily and waste disposed at the end of the day.

## 17. WILDLIFE

If you are in the presence of a wildlife animal on the site, you must complete the form provided for this purpose and available at CRT's office. You must report any wildlife animal. This information is collected and analyzed by biologists who measure the impact of construction on animal populations.

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**18. RADIO COMMUNICATION ON SITE**

Radio communications are very important on site and because of the extent of the construction site and the number of workers; a practical and efficient radio protocol has been developed.

All communications users are required to comply with the protocol.

See Appendix 1 for the Radio Protocol used at the Innavik Project (TO FOLLOW)

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## ***A P P E N D I X 1***

### ***Telecommunication Protocol***

***To be follow***

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## ***A P P E N D I X 2***

### ***Truck Operation Protocol***

***To be follow***

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***APPENDIX 3***  
***Health Questionnaire***

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Health Questionnaire		
Last Name :		
First Name :		
Address		
<b>If you suffer from or have suffered from a disease listed below, please mention it in the appropriate box</b>		
	<b>YES</b>	<b>NO</b>
Heart Disease	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes	<input type="checkbox"/>	<input type="checkbox"/>
Epilepsy	<input type="checkbox"/>	<input type="checkbox"/>
Hemophilia	<input type="checkbox"/>	<input type="checkbox"/>
Hepatitis C	<input type="checkbox"/>	<input type="checkbox"/>
High Blood Pressure	<input type="checkbox"/>	<input type="checkbox"/>
Respiratory Disease	<input type="checkbox"/>	<input type="checkbox"/>
Heart Attack – within two years	<input type="checkbox"/>	<input type="checkbox"/>
Surgery	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
Allergy, specify	<input type="checkbox"/>	<input type="checkbox"/>
<b>Do you suffer from a disease requiring the use of injection? Specify:</b>		
I confirm that all the information provided below is true and to the best of my knowledge		
Signature	Date: YY/MM/DD	

# ***Appendix 3***

Ketek\_Forced Air Manual Diesel 20202050 Advanced Units.pdf