Assessment of Social Impacts in Environmental Assessment Processes Applicable to Nunavik

Partial Analysis Report

Presented to: Kativik Environmental Advisory Committee

May 2019



FOREWORD

The Kativik Environmental Advisory Committee (KEAC) tasked the Secrétariat international francophone pour l'évaluation environnementale (SIFÉE) with conducting a study on the assessment of social impacts in environmental assessment (EA) processes applicable to Nunavik. In accordance with the work specifications signed by the parties on March 27, SIFÉE was to provide the KEAC with a draft partial analysis report by May 11, 2019, containing:

- An overview of the provincial and federal environmental assessment processes established under Section 23 of the James Bay and Northern Quebec Agreement (JBNQA); and
- A list of development projects subject to the processes and a summary description of the Environmental and Social Impact Assessment (ESIA) conducted for a representative sample of these projects.

As mentioned in previous emails, access to data in order to conduct the research was more difficult than expected.

With respect to cases arising from the application of the provincial process established under Section 23 of the JBNQA, the documents sought for the study, consisting mainly of impact assessment and consultation reports, are considered by the Quebec Department of the Environment and the Fight Against Climate Change (MELCC) to originate from a third party and require the latter's approval before the content can be disclosed. An access to information request was submitted on April 5 to the MELCC Direction des renseignements et de l'accès à l'information [Enquiries and Access to Information Directorate] regarding 16 cases identified from the lists provided by Cynthia Marchildon and Daniel Berrouard from MELCC. An agreement on a two-phase approach was reached with the directorate. The first phase involved providing us with guidelines, decrees and amendments to certificates of authorization so that relevant documents could be pinpointed in order to respond to the third parties' requests. We received this information on Monday, May 13.

As for cases stemming from the application of the federal process established under Section 23 of the JBNQA, we retained the services of François Boulanger, former director of the Quebec Office of the Canadian Environmental Assessment Agency (CEAA) and current director of COFEX-North, to identify projects that were subject to this process and to locate documents for each environmental assessment file. The latter provided us with information on seven cases. We received this information on Monday, May 13. Information on other cases should be sent to us in the coming days.

^{1.} We disagree with this restrictive interpretation of the provisions of the *Act Respecting Access to Documents Held by Public Bodies and the Protection of Personal Information*, as environmental assessment files can be published pursuant to Chapter II of the *Environment Quality Act*. We do not understand why this right to access information would lapse after the consultation period. The JBNQA makes no reference to this matter.

Data from the documents received will be analyzed and incorporated into the partial analysis report. However, the challenges encountered in obtaining the information needed to conduct the research are expected to impact the deadline of March 27 established in the specifications and will need to be reviewed.

TABLE OF CONTENTS

INTRODUCTION	4
BACKGROUND	5
1. PROCESS MAPPING	6
2. PROJECT SUBMISSION	8
2.1. Innavik Hydroelectric Project	8
2.2. Inukjuak Residual Materials Site Project	8
2.3. Puimajuq Mining Project	9
2.4. Raglan Mine Project (Phases II and III)	9
3. ISSUE IDENTIFICATION AND ANALYSIS	10
3.1. Public health of populations affected by the projects	10
3.2. Continuation of traditional activities on the land concerned	11
3.3. Maintenance of conditions for local population movements	11
3.4. Economic development of Inuit communities	12
3.5. Protection of cultural and natural heritage	12
3.6. Intercommunity relations	13
3.7. Change in way of life for Inuit families	13
4. PRELIMINARY FINDINGS	14
REFERENCES	15
APPENDIX 1. ISSUE IDENTIFICATION AND ANALYSIS TABLE	16

INTRODUCTION

This study focuses on the assessment of social impacts in environmental assessment (EA) processes applicable to Nunavik. The objectives that the Kativik Environmental Advisory Committee (KEAC) is seeking to achieve by conducting this assessment are to draw a comparison between the scope of the social impact assessment (SIA) conducted as part of the processes in effect in Nunavik, to identify the strengths and weaknesses of each process, and to make recommendations to the authorities responsible for process application and implementation. This assessment is being conducted within the KEAC's mandate to make recommendations to governments responsible for the implementation of Section 23 of the James Bay and Northern Quebec Agreement (JBNQA) and share its work with the authorities responsible for other EA processes applicable in Nunavik.

The following steps are planned in order to produce a draft partial analysis report:

- Prepare an overview of the provincial and federal environmental assessment processes established under Section 23 of the JBNQA; and
- Create a list of development projects subject to the processes and draft a summary description of the Environmental and Social Impact Assessment (ESIA) conducted for a representative sample of these projects.

This draft partial analysis report discusses four cases stemming from the application of the provincial process established under Section 23 of the JBNQA: Innavik 2010, Inukjuak 2014, Raglan Mine 2015 and Nunavik Nickel 2015. The analysis will be supplemented by other cases when the relevant documents are available.

The analysis was carried out by means of a grid outlining project activities that are a source of impact (in italics), modifications to the components of the biophysical and human environments affected (in italics), and the impacts these modifications have on specific issues. The grid also set outs measures proposed to mitigate the impacts.

BACKGROUND

Nunavik is a territory located in the northern part of Quebec. It covers an area of close to 500,000 km² and is situated north of the 55th parallel (KEAC 2019). It has a population of approximately 12,000 residents, more than 90% of whom are Inuit, scattered across 14 communities along the coast. The Inuit way of life is influenced by a very cold climate, with average temperatures holding below zero between November and May (Kativik 2014).

Nunavik's landscape is characterized by an absence of trees, continuous permafrost and non-shrubby vegetation (RSW 2010). It is dotted with numerous lakes and rivers. Mountain ranges and vast plains stretching across an immense expanse of land characterize its topography. Terrestrial, avian and aquatic wildlife as well as flora adapted to the Arctic conditions occur in the region.

In 1975, political and administrative organization was introduced in Nunavik through the JBNQA. Most jobs are in the primary and tertiary sectors (WSP 2015). The territory has significant mining potential. Many companies, including Glencore and Canadian Royalties, have ore deposit mining operations close to Deception Bay to sell ore concentrate to smelters outside the territory (SNC-Lavalin 2015).

1. PROCESS MAPPING

The plan developed under Section 23 of the JBNQA entitled "Environment and Future Development North of the 55th Parallel" provides for a two-pronged environmental and social impact assessment system. Two procedures can apply, either the federal procedure arising from the implementation of the *Canadian Environmental Assessment Act* (CEAA) or the provincial procedure stemming from Chapter II of the *Environment Quality Act* (EQA). The jurisdiction under which a project falls determines the applicable procedure. However, it is possible for both procedures to apply simultaneously or be combined if both the federal and the provincial jurisdictions are involved.

These two processes are complemented by the process under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the process set out in Article 7 of the Nunavik Inuit Land Claims Agreement (NILCA). This report, however, only deals with the two processes established under the JBNQA.

The environmental and social impact assessment system is underpinned by a category-based preliminary screening mechanism that consists in creating, as a first step, a list of activities subject to the obligation to conduct an impact assessment and a list of excluded activities. Where an activity is not subject or excluded under the Agreement, it falls to the entity responsible to decide whether an impact assessment should be conducted.

The mechanism provides for the participation of Indigenous and non-Indigenous people in joint committees. Under the provincial procedure, the Kativik Environmental Quality Commission (KEQC), which comprises five Quebec and four Inuit representatives, is involved at various stages of the process. It is the decision-making body at the initial analysis (or preliminary screening) stage that decides whether an impact assessment is required. It is also involved in the scoping stage. Once it is determined that an impact assessment is required, the scoping stage identifies the main environmental, social and economic issues raised by the project and establishes the scope of the assessment to be conducted. Once the impact assessment is completed, the KEQC analyzes it and makes a decision on the project's implementation. Where appropriate, it also determines the measures that will have to be adopted to mitigate the impacts and maximize the benefits. The Administrator² can, however, override the KEQC decision, if there are grounds to do so.

As far as the federal procedure is concerned, two committees are involved in the process. The Federal Review Panel (COFEX) comprises two Cree and two Canadian representatives. The Federal Screening Committee (COSE) comprises two Quebec and two Inuit representatives. These committees are involved in the preliminary screening and scoping stages of the impact assessment in an advisory capacity. COFEX-North comes in when the impact assessment is being reviewed and

6

^{2.}In the case of matters respecting provincial jurisdiction, the provincial Administrator is the director of the Quebec Environmental Protection Service or his [or her] successor, or any person or persons authorized from time to time by the Lieutenant-Governor in Council to exercise functions described in this Section (JBNQA, s. 23.1.6).

acts in an advisory capacity during the decision-making phase. However, the decision-making body in the preliminary screening, scoping and decision-making stages is the federal Administrator.³

The following table summarizes the system put in place by Section 23 of the JBNQA and identifies the stakeholders in each phase of the process.

Table 1: Environmental assessment process stakeholders in Nunavik

Procedure	Subject to	Content of assessment	Impact assessment	Review of impact assessment	Decision
Provincial	KEQC	KEQC Administrator	Proponent	KEQC	KEQC*
Federal	COSE / COFEX-North Administrator	COSE / COFEX-North Administrator	Proponent	COFEX-North	COFEX-North Administrator
Recomm	nends				

^{*}The Administrator can override the KEQC decision.

Taken from: Fréchette, 2019

KEQC: Kativik Environmental Quality Commission

COFEX: Federal Review Panel

COSE: Federal Screening Committee

^{3.} In the case of matters respecting federal jurisdiction, the federal Administrator is the Federal Minister of Environment or any other person or persons authorized from time to time by the Governor in Council to exercise functions described in this Section (JBNQA, s. 23.1.2).

2. PROJECT SUBMISSION

The four social impact assessments analyzed in this report pertain to projects subject to the provincial process. These projects are the following:

- Innavik Hydroelectric Project (2010)
- Inukjuak Residual Materials Site Project (2014)
- Puimajuq Mining Project (2015)
- Raglan Mine Project (Phases II and III) (2015)

2.1. Innavik Hydroelectric Project

The Innavik project is a project to build a 7.5 MW hydroelectric generating station on the Inukjuak River (RSW 2010). It involves the construction of a 42-metre-high concrete dam, a generating station powered by two turbines and a transmission line connecting the station to the village of Inukjuak (RSW 2010). The facilities are located 10.3 km from the mouth of the river. The project construction phase also includes:

- The establishment of a workers' camp over an area of 0.9 ha able to house 128 people;
- The construction of an access road on an existing ATV trail;
- The creation of three material borrow pits; and
- The construction of a cofferdam and diversion channel 180 m long.

In terms of economic benefits during the construction phase, the project entails the creation of construction jobs and the procurement of goods and services from local businesses (not specified in the impact assessment report). Economic benefits are also expected in the operating phase.

The purpose of the project is to provide the Inukjuak community with a new source of renewable energy by replacing the current diesel-powered plant. Inukjuak has 1,597 residents as well as public and private institutions and local shops and services.

2.2. Inukjuak Residual Materials Site Project

The project to build a residual materials landfill site in Inukjuak carried out in 2015 sought to replace the existing site, whose landfill capacity had been reached (Kativik 2014). It also included the development of 10 cells with a total capacity of 70,000 m³. The project required no new access road. A fence was installed to control access to the site. Household residual materials, end-of-life vehicles or appliances, and hazardous residual materials are also stored on the site. Residual material compacting and layer capping are the main residual material management methods. Burning as a method of disposal was to gradually disappear. A collection system was reconfigured, with two trucks providing service between the village and the site.

2.3. Puimajuq Mining Project

The Puimajuq mine site is located 59 km west of the Inuit village of Kangiqsujuaq, 154 km southeast of the village of Salluit and 290 km from Puvirnituq. The Pingualuit National Park [Parc national des Pingualuit] is also 23 km north of the site (WSP 2015).

Puimajuq is the fourth site operated by Canadian Royalties Inc. besides Expo, Mesamax and Allamma. The project involved open pit mining, a catchment system and a wastewater retention pond with a 6,000 m³ capacity. A road stretching more than 10 km was built to connect the site to the road leading to the Deception Bay port. Lastly, a camp was erected to accommodate workers.

Mining of the Puimajuq deposit began in September 2016 and wrapped up at the end of 2017, with a restoration phase in 2018. The estimated production capacity was 3,375 tonnes of nickel ore per week.

Mining operations ran day and night. Extractive activities produced a significant amount of tailings (or waste rock) totalling 1,715,407 tonnes. Large quantities of various residual materials and wastewater were produced.

A tripartite agreement between the proponent, communities from the neighbouring villages and Makivik Corporation, an Inuit organization that represents the region's economic and social interests, laid out the economic benefits for the Inuit communities during the life of the site.

2.4. Raglan Mine Project (Phases II and III)

Glencore's Raglan Mine Project (Phases II and III) aims to extend nickel deposit mining operations until 2040. The site is located east of the village of Katinniq (SNC-Lavalin 2015). Phase II of the project involves opening two new underground mines (projects 14 and 8). The first has an annual production capacity of 850,000 tonnes of ore over the course of approximately 8 to 10 years, while the second has an annual production capacity of over 500,000 tonnes of ore over a period of around 10 to 15 years. Phase III will involve opening three new underground mines.

The infrastructure in place for Phase I, such as the concentrator, the building complex, Deception Bay port facilities, the airport and access roads will be used in phases II and III. Two vessels will transport equipment and ore to secondary and tertiary processing sites located to the south.

The project entails the construction of a catchment system and a wastewater retention pond as well as a tailings and residual materials management system. Related infrastructure also includes a vehicle washing station, an explosives warehouse for blasting activities and a sodium chloride warehouse for road de-icing.

Work days are long and based on rotating work schedules that consist of alternating work and leave periods of several consecutive days in length. Non-work-related activities, such as a sport fishing program, are also organized and offered to mine workers. The proponent will reach an agreement with the communities, called the "Raglan Agreement," to ensure that Inuit businesses and workers enjoy economic benefits.

3. ISSUE IDENTIFICATION AND ANALYSIS

As announced in the work plan, the analysis results are presented by way of an analysis grid structured by issue (see APPENDIX 1). This grid outlines project activities that are a source of impact (in italics), changes to components of the biophysical and human environments affected (in italics), and the impacts these modifications have on specific issues. The grid also sets out measures proposed to mitigate the impacts. This way of structuring information aims to create a "chain of consequences" arising from the planned activities by identifying its components for each issue.

3.1. Public health of populations affected by the projects

The preservation of the quality of community sources of drinking water can be a public health issue in that the project activities would change the biochemical properties, making the water unsafe to drink. In the case of the Innavik Hydroelectric Project, the use of granular material containing fine particulate matter to build a cofferdam and diversion channel on the Inukjuak River would change the chemical composition of the river water, which is a source of drinking water for the village. If consumed, this water could cause health problems among its inhabitants. The mitigation measures adopted, consisting in the use of granular material without fine particulate matter and the construction of another temporary water intake at the outlet of Lake Qattaakuluup Tasinga, will solve the problem in the short term.

As for the construction of the landfill in Inukjuak, rainwater infiltration by way of percolation through the residual materials pile produces leachate. If not removed, leachate is likely to contaminate ground and surface water. However, the source of drinking water for the village of Inukjuak, located far upstream of the river of the same name, cannot be affected by contamination of ground or surface water surrounding the site. The construction of leachate collection ditches at the edge of the site to divert runoff and the creation of good drainage for water from the landfill have been planned nonetheless.

<u>For the two mining sites</u>, exposed to rain, the piles of waste rock from excavation work allow residual metal particles to escape into ground and surface water serving as a drinking water supply for communities bordering the site. For the Raglan and Puimajuq mine sites, a drainage water catchment system, retention ponds and a wastewater treatment plant have been planned.

The observation arising from the analysis of the four cases under study is that the risk of contamination of water used as a source of supply for communities is fairly well controlled through the adoption of appropriate mitigation measures. However, the supervision of the systems in place and environmental monitoring become top issues in this context. Incorrect system operation due to poor maintenance could reduce their effectiveness, leading to the contamination of sources of drinking water and putting the health of the populations concerned at risk.

3.2. Continuation of traditional activities on the land concerned

Traditional fishing is an important part of the Inuit way of life. In the case of the construction of the Innavik hydroelectric generating station, the construction of the cofferdam and diversion channel will change the water regime and lead to the disappearance of whitewater areas. However, given that spawning grounds, particularly for species of salmonids, are usually located in these areas, their number will decrease and will therefore affect the river's productivity and catch potential. The construction of a diversion channel is also planned to maintain the river's natural water levels.

During the generating station's operating phase, water turbines lead to excess mortality of fish species, further reducing catch potential. The installation of a system of fine screens at the inlet of water flows from the turbines to block fish passage has been planned. Lastly, impounding the reservoir will raise the water level and flood land upstream, which will destroy traditional fishing sites.

Altering the biophysical environment, both upstream and downstream of the work, has a considerable impact on traditional fishing and makes the practice by Inuit populations on the land concerned more precarious.

Monitoring the effectiveness of the mitigation measures adopted on stream productivity upstream and downstream is a crucial project implementation issue. It could be that despite the effectiveness of the measures adopted regarding river productivity, the mere presence of work is a "disincentive" to continuing traditional fishing on the river. No action could then be taken to counter the lack of interest of the populations concerned in maintaining their fishing activities on the river.

3.3. Maintenance of conditions for local population movements

The activities of the projects analyzed can affect the conditions under which populations move around the territory in terms of safety and travel time during the winter.

In the case of the Innavik hydroelectric generating station, the construction of an access road on the existing ATV trail is planned. This infrastructure will be shared with trucks travelling between the site and the village. Users of the ATV trail will now have to share the road with heavy-duty vehicles, increasing the risk of injury in case of an accident, not to mention the risk of accident itself due to heavier traffic. The mitigation measure planned is to widen and level the ATV trail.

For the Raglan Mine, once the site is operational, there will be a significant increase in marine transportation in Deception Bay, which will weaken the bay's ice cover. Waterfront residents use the ice surface to travel on snowmobiles. Poor ice quality resulting from the frequent passage of vessels raises the risk of accident or breakage of the snowmobiles, forcing users to take an alternative route to avoid crossing the bay. This increases travel time and alters the way of life. The construction of an ice bridge or aluminum bridge to make travel easier for users is planned.

In both assessments, project activities can have an impact on the safety of transportation infrastructure users and the time it takes populations to travel across a given territory. The mitigation measures proposed are likely to improve the situation, but do not guarantee that project activities will not disrupt traditional activities.

3.4. Economic development of Inuit communities

The fourth theme is the economic development of Inuit communities, first in relation to the <u>employment situation in Inuit communities at the local level</u>. In Nunavik, the employment market is concentrated mainly in the primary and tertiary sectors. In the primary sector, employment-generating activities consist of wildlife and mining resource development. In the tertiary sector, jobs are mainly concentrated in regional government, health care services, teaching and retail.

The launch of development projects and the adoption of measures promoting the recruitment of Inuit workers have a positive impact on the employment situation in the communities concerned. During the construction phase, the benefits are mainly in the construction sector through the creation of skilled jobs. This was notably the case in the Inuit communities of Inukjuak, Salluit and Kangiqsujuaq.

The second economic development issue is the Inuit workforce situation. The workforce situation is dictated by workers' qualification level across a given territory. The creation of direct and indirect jobs in the project construction and operating phases can have a positive influence on improving workforce qualifications in two ways: (1) by stimulating workers' interest in acquiring new skills in order to improve their chances of getting one of the jobs created as part of the project, and (2) through participation in project implementation by workers, who, in so doing, acquire new skills through experience or company training. In all the cases analyzed, measures were taken to improve the skills of Inuit workers, particularly by creating internships or putting in place training programs in partnership with companies.

The third issue is the <u>participation of Inuit businesses in project implementation as successful tenderers or subcontractors</u>. The measures taken in this regard entail applying criteria that give preference to Inuit companies, meaning that an Inuit company is chosen if a service or product offering is equivalent. Another measure consists in identifying mechanisms to help small and medium-sized businesses to qualify for and respond to calls for tender. Disaggregation is another measure to foster the participation of Inuit businesses.

3.5. Protection of cultural and natural heritage

Inuit cultural heritage comprises sites of archaeological significance and burial sites. Natural heritage comprises remarkable natural sites, such as Pingualuit National Park.

In the <u>case of the Inukjuak hydroelectric generating station</u>, the original access road encroached on two archaeological sites on which the Inuit community placed a great deal of spiritual value. The road was moved south. The presence of the workers' camp near a third site was viewed as encroaching on the site as such. The camp was moved further from the site and a perimeter delineating it was established.

^{4.} In some cases, this interest was measured by the increase in the number of people registered for training courses in relevant fields.

<u>In the Raglan Mine project</u>, there was fear of destroying the archaeological sites at the locations where excavation work was to take place. The decision was made to create an inventory of archaeological sites before proceeding with the work.

The landscape is also part of heritage protection. The presence of equipment and structures or of any activities that alter the physical appearance of a site can change the perceptions that residents or people who frequent the area have of the environment that makes up their living environment. In the cases assessed, measures were taken to mitigate the visual impact of the presence of equipment or structures or any other alterations of the physical environment. However, it is important to note that mere knowledge of the presence of these pieces of equipment or structures or of the alteration of the physical environment can have the same effect.

The landscape can also be considered a tourist attraction. "Landscape conservation" can be analyzed in terms of loss or alteration of sites valued by users of the area for their intrinsic value and/or their value as a tourist attraction (change to component). In the Raglan Mine project, consideration was given to the impact of light pollution caused by the mine's presence on the experience of Pingualuit National Park visitors.

3.6. Intercommunity relations

During Phase I of deposit mining in the Raglan Mine project, mine workers took to sport fishing in their spare time in Deception Bay and in lakes in nearby areas also frequented by Inuit. The presence of non-Indigenous fishers drove Inuit fishers away from their usual fishing site.

In addition, the presence of a greater number of fishers increased pressure on fishery resources (Arctic char) valued by Inuit, creating a sort of competition likely to spark tensions between Inuit and non-Indigenous fishers. As part of the implementation of phases II and III, the mine's management proposed supervising sport fishing in the lakes near mine infrastructure.

3.7. Change in way of life for Inuit families

Constraining work schedules have changed the way of life for Inuit families. With workers away for long stretches of time, families experience disruptions. This impact could erode family bonds. The Raglan Mine's management plans to expand support for the families concerned as well as psychological and social services for Inuit workers.

4. PRELIMINARY FINDINGS

Although it looks at a small number of cases, the analysis has already identified some concerns that could constitute project issues from a social standpoint. However, as observed in other research on social impact assessments (Gagnon 2002, Côté et al. 2007), impact assessment reports analyze changes to human environment components brought about by projects rather than the social consequences of such changes.

It is important to make a distinction between the concept of "change," which refers to the alteration of a human environment component, and the concept of "impact of change," which refers to the significance of this change relative to the problem identified as an <u>issue</u>. For example, the relocation of populations as a result of the implementation of a project is not in itself a social impact, but it can cause a number of social impacts: anxiety, stress, feeling of insecurity, change in family structure and so on. Similarly, a (rapid) increase or decrease in population is not an impact, but may cause social impacts: destruction of the community's social fabric and change in residents' perception of their community.

Like Rossouw and Malan (2007), Vanclay (2000) challenges the assumption that all changes caused by project implementation likely to improve a community's situation, in terms of meeting its core employment, housing, health, education and other needs, constitute a positive social impact in and of themselves. He believes the opposite; some project effects can introduce major disruptors into the way of life of individuals and the governance of local communities, and even cause the social fabric to break down. He argues that, to assess social impacts, consideration must be given to the social and cultural context in which the changes introduced by the project occur. He therefore encourages practitioners to take into account "quality of life" rather than "standard of living" as a criterion for assessing the social impact of project effects.

The preliminary analysis of the cases assessed tends to confirm the apprehensions of these authors, given the little information found in the documents consulted on the social consequences of the changes caused by the projects. An analysis of other cases will help us confirm or refute these initial findings.

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APPENDIX 1: ISSUE IDENTIFICATION AND ANALYSIS TABLE

(see next page)

ISSUE PUBLIC HEALTH OF POPULATION	PROJECT ACTIVITY Impact source (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
PRESERVATION OF QUALITY OF SOURCES OF COMMUNITY DRINKING WATER	DEVELOPMENT OF RIVER INSTALLATIONS Discharge of fine particulate matter into the water (RSW 2010, 3.3.3. Dérivation et Batardeau [Diversion and cofferdam], p. 29)	SURFACE WATER Change to chemical composition of water (RSW 2010, 6.1.3. Caractéristiques physico-chimiques de l'eau [Physicochemical characteristics of water], p. 58)	WATER TABLE Contamination (RSW 2010, 6.1.3. Caractéristiques physicochimiques de l'eau [Physicochemical characteristics of water], p. 58)	COMMUNITIES	Use granular materials free of fine particulate matter. Develop another temporary intake at the outfall of Lake Qattaakuluup Tasinga (RSW 2010, 6.1.3. Caractéristiques physicochimiques de l'eau [Physicochemical characteristics of water], p. 58)
WATER	MANAGEMENT OF RESIDUAL MATERIALS LANDFILL Leachate runoff (Kativik 2014, 14.1.5. Liquid Discharge, p. 48)	GROUNDWATER SURFACE WATER Change to chemical composition of water (Kativik, 2014, 14.2.2. Water, p. 56)	WATER TABLE SURFACE SUPPLY SOURCES Contamination (Kativik, 2014, 14.2.8. Population, p. 61)	ACCESS TO DRINKING WATER OF AFFECTED COMMUNITIES	MITIGATION MEASURE Construct peripheral ditches to redirect runoff and provide good drainage for water from landfill site (Kativik, 2014, 14.2.2. Water, p. 56)
	CREATION OF WASTE ROCK PILE Dissolved nickel and other dissolved metals (SNC-Lavalin 2015, 6.2.2.1.2.1 Impact Sources, p. 6-33)	GROUNDWATER SURFACE WATER Change to chemical composition of water (SNC-Lavalin, 2015, 6.2.2.1.2.2 Description of Impacts, p. 6-34)	WATER TABLE SURFACE SUPPLY SOURCES Contamination (SNC- Lavalin, 2015, 5.4.9.2 Drinking Water Supply, p. 5-366)		MITIGATION MEASURE Channel drainage water to collecting ponds before pumping it to the treatment plant at Mesamax (SNC-Lavalin, 2015, 6.2.2.1.2.4 Specific Mitigation Measures, p. 6-38)

ISSUE CONTINUATION OF TRADITIONAL ACTIVITIES	PROJECT ACTIVITY Impact source (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
	CONSTRUCTION OF RIVER INSTALLATIONS Construction of a diversion channel and cofferdam - Loss of whitewater areas (RSW 2010, 3.3.3, p. 29)	AQUATIC FAUNA Reduction in number of salmonid spawning sites (RSW 2010, 6.2.2 Faune ichtyenne [Fish fauna], p. 77)	SUBSISTENCE FISHING Reduction in catches of affected species (RSW 2010, 6.2.2 Faune ichtyenne [Fish fauna], p. 79)	PRACTICE BECOMES PRECARIOUS	MITIGATION MEASURE Design diversion channel so as to maintain natural water levels (RSW 2010, 6.1.2. Conditions hydrodynamiques [Hydrodynamic conditions], p. 53)
MAINTENANCE OF SUBSISTENCE FISHING PRACTICES	GENERATING STATION OPERATION Operation of station turbines (RSW 2010, 3.2.3 Centrale [Generating station], p. 24)	AQUATIC FAUNA Higher salmonid mortality (RSW 2010, 6.2.2 Faune ichtyenne [Fish fauna], p. 82)	SUBSISTENCE FISHING Reduction in catches of affected species (RSW 2010, 6.2.2 Faune ichtyenne [Fish fauna], p. 79)	PRACTICE BECOMES PRECARIOUS	MITIGATION MEASURE Install fine screens to minimize fish mortality risks (RSW 2010, 6.2.2 Faune ichtyenne [Fish fauna], p. 82)
	RESERVOIR IMPOUNDMENT AND OPERATION ⁵ Flooding of land upstream from headpond (RSW 2010, Contrôles hydrodynamiques [Hydrodynamic controls], p. 54)	(See footnote)	SUBSISTENCE FISHING Destruction of fishing sites (RSW 2010, 6.2.2 Faune ichtyenne [Fish fauna], p. 79)	PRACTICE BECOMES PRECARIOUS	MITIGATION MEASURE None
	RESERVOIR IMPOUNDMENT AND OPERATION Reduction of level and flow upstream from headpond (RSW, 2010, Hydrodynamic controls, p. 54)	(See footnote)			

5. The implementation of hydroelectric projects generally leads to the <u>alteration of the water regime</u>. This modification can change the productivity of watercourses, resulting in a decrease or increase in the resource in the affected areas. It can also affect the navigability of watercourses, and hence access to fishing sites by boat. Lastly, the alteration of the water regime can make fishing sites unusable due to the variation in the water level downstream from impoundments.

ISSUE MAINTENANCE OF CONDITIONS FOR LOCAL POPULATION MOVEMENTS	•	BIOPHYSICAL ENVIRONMENT COMPONENT Change to Component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
SAFETY OF USERS OF LAND TRANSPORTATION INFRASTRUCTURE	CONSTRUCTION OF ACCESS ROAD Existing ATV trail modified to an access road (RSW 2010, 3.2.8. Route d'accès Access road], p. 25)		ATV TRAIL ATV trail shared with trucks (RSW 2010, 6.3.2 Circulation automobile [Vehicular traffic], p. 102)	RISKS OF ACCIDENT FOR ATV TRAIL USERS	MITIGATION MEASURE Upgrade ATV trail and widen it by five metres (RSW 2010, 3.2.8. Route d'accès [Access road], p. 25)
LONGER TRAVEL TIME IN WINTER	WINTER MARINE TRANSPORTATION IN DECEPTION BAY Vessel passage (SNC-Lavalin 2015, 3.8.5. Ore Concentrate Transportation, p. 103) 5.4.10.7.4 Ice conditions in Deception Bay, pp. 5-395)	,,,,,		AVOIDANCE OF OLD TRAIL IN FAVOUR OF A NEW LONGER ONE	Plan creation of an ice bridge or use the aluminum bridge. Participate in analysis of results from the ice monitoring program in Deception Bay and implement its recommendations to facilitate the Sallumiut's use of the bay in winter. (SNC-Lavalin 2015, 6.4.3.2.4 Specific Mitigation Measures, p. 6-125)

ISSUE ECONOMIC DEVELOPMENT OF INUIT COMMUNITIES	PROJECT ACTIVITY Impact source (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
	PERSONNEL RECRUITMENT FOR HYDRO-ELECTRIC PROJECT Creation of skilled jobs (RSW 2010, 6.3.1. Aspects socio- économiques [Socio-economic aspects], p. 101)		JOB MARKET Rate of employment of Inuit workers on the project (RSW 2010, 6.3.1. Aspects socio-économiques [Socio-economic aspects], p. 97)		IMPROVEMENT MEASURE Give preference to hiring local personnel (RSW 2010, 6.3.1. Aspects socio-économiques [Socio-economic aspects], p. 100)
EMPLOYMENT SITUATION IN LOCAL INUIT COMMUNITIES	PERSONNEL RECRUITMENT FOR MINE PROJECT Job Creation (SNC-Lavalin 2015, 6.4.1.2.1 Impact Sources, p. 6-66)		JOB MARKET Employment rate of Inuit workers on project (SNC- Lavalin 2015, 6.4.1.2.2 Impact Description, p. 6-67)		IMPROVEMENT MEASURE Hiring priority to Inuit from Salluit, Kangiqsujuaq and other Northern villages, and Quebec and Canada Inuit, according to chapter 5 of the Raglan Agreement (SNC-Lavalin 2015, Overview of the Main Current Measures Relating to Inuit Employment, p. 6-73)
	PERSONNEL RECRUITMENT FOR SITE RESTORATION Job Creation (Kativik 2014, 14.1.12. Site Rehabilitation, p. 52)		JOB MARKET Rate of employment of Inuit workers (Kativik 2014, <mark>14.2.8.6.</mark> Economic Impacts, p. 63)		IMPROVEMENT MEASURE The project will also provide a minimum number of working hours for the heavy equipment operators since it will last for at least two years. (Kativik 2014, 14.2.8.6. Economic Impacts, p. 63)

ISSUE ECONOMIC DEVELOPMENT OF INUIT COMMUNITIES	PROJECT ACTIVITY Impact source (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
	RECRUITMENT OF PERSONNEL TO BUILD AND OPERATE GENERATING STATION Skills required (RSW 2010, 6.3.1. Aspects socio-économiques [Socio-economic aspects], p. 99)		OCCUPATIONAL QUALIFICATION OF INUIT WORKFORCE ⁶ Number of registrations for internships or in- house training (RSW 2010, 6.3.1. Aspects socio- économiques [Socio- economic aspects], p. 97)	IMPROVEMENT OF EMPLOYABILITY OF LOCAL WORKFORCE	IMPROVEMENT MEASURE Plan labourer training in construction trades (RSW 2010, 6.3.1. Aspects socio-économiques [Socio-economic aspects], p. 99)
INUIT WORKFORCE SITUATION	RECRUITMENT OF PERSONNEL TO BUILD AND OPERATE MINE Skills of hired workers (WSP 2015, 7.4.2 Economy and Jobs, p. 73)		OCCUPATIONAL QUALIFICATION OF INUIT WORKFORCE Number of registrations for internships or in-house training (WSP 2015, 7.4.2 Economy and Jobs, p. 73)	IMPROVEMENT OF EMPLOYABILITY OF LOCAL WORKFORCE	IMPROVEMENT MEASURE Set up a training program to be used in Inuit villages to recruit personnel (WSP 2015, 7.4.2, Economy and Jobs, p. 73)
	RECRUITMENT OF PERSONNEL TO BUILD AND OPERATE MINE Skills of hired workers (SNC-Lavalin 2015, 5.4.6.4 Training Programs offered at Raglan Mine, p. 5-280)		OCCUPATIONAL QUALIFICATION OF INUIT WORKFORCE Number of participants in partnership training programs (SNC-Lavalin 2015, 5.4.6.4.3 Tamatumani Program, p. 5-284)	IMPROVEMENT OF EMPLOYABILITY OF LOCAL WORKFORCE	IMPROVEMENT MEASURE Maintain current salaried Inuit workforce and take opportunities to increase the number of Inuit workers (SNC- Lavalin 2015, 6.4.1.2.4 Specific Mitigation and Improvement Measures, p. 6-80)

^{6.} The creation of a local labour pool follows from the experience acquired by workers on the job site and those who, in light of the employment prospects created by the project, have decided to upgrade their skills by taking training courses in the construction trades or other fields, such as administration.

ISSUE ECONOMIC DEVELOPMENT OF INUIT COMMUNITIES	PROJECT ACTIVITY Impact source (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
PARTICIPATION OF INUIT BUSINESSES IN PROJECTS	SUBCONTRACTING OF MINE CONSTRUCTION AND OPERATION Procurement of goods and services for the work (WSP 2015, 7.4.2 Economy and Jobs, p. 73)		LOCAL BUSINESSES Number of Inuit businesses subcontracting for mining site (WSP 2015, 7.4.2 Economy and Jobs, p. 73)	ECONOMIC ACTIVITY OF LOCAL BUSINESSES	IMPROVEMENT MEASURE Consider Inuit firms first when awarding various mining infrastructure construction, operation and maintenance contracts (WSP 2015, 7.4.2 Economy and Jobs, p. 73)
	SUBCONTRACTING OF CONSTRUCTION AND OPERATION OF THE MINE Bidding procedure for procurement goods and services (SNC-Lavalin 2015, 6.4.1.2.1 Impact Sources, p. 6-66)		INUIT BUSINESSES Success rate of bids on calls for tenders (SNC-Lavalin 2015, 6.4.1.2.2 Impact Description, p. 6-67)	COMPETITIVENESS OF LOCAL INUIT BUSINESSES	IMPROVEMENT MEASURE Identify mechanisms to help SMEs qualify for and bid on calls for tenders (SNC-Lavalin 2015, 6.4.1.2.4 Specific Mitigation and Improvement Measures, p. 6-80)

PROTECTION OF HISTORICAL AND NATURAL HERITAGE	PROJECT ACTIVITY Source of impact (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
PROTECTION OF	CONSTRUCTION OF ACCESS ROAD Determination of the routing (RSW 2010, 3.2.8. Route d'accès [Access road], p. 25)		ARCHAEOLOGICAL SITE Physical impingement (RSW 2010, 6.3.5. Patrimoine et archéologie [Heritage and archaeology], p. 106)	LEADING TO A FEELING OF	MITIGATION MEASURE Move the road south to preserve the two existing archaeological sites (RSW 2010, 6.3.5. Patrimone et archéologie [Heritage and archaeology], p. 107)
ARCHAEOLOGICAL HERITAGE	ESTABLISHMENT OF WORKERS' CAMP Determination of camp location (RSW 2010, Logement et transport [Housing and transportation], p. 31)		ARCHAEOLOGICAL SITE Physical impingement (RSW 2010, 6.3.5. Patrimone et archéologie [Heritage and archaeology], p. 106)	LEADING TO A FEELING OF	MITIGATION MEASURE Plan the camp so it is away from the archaeological site (RSW 2010, Patrimone et archéologie [Heritage and archaeology], p. 107)
	CONSTRUCTION OF SURFACE INFRASTRUCTURE Excavation work (SNC-Lavalin 2015, 3.3.1 Description of Preparatory and Construction Activities, p. 3-35)		ARCHAEOLOGICAL SITE Fortuitous discovery or accidental destruction of a new site (SNC-Lavalin 2015, 6.4.4.2.2 Impact Description, p. 6-129)		MITIGATION MEASURE Undertake an archaeological inventory before proceeding with work (SNC-Lavalin 2015, 6.4.4.2.4 Specific Mitigation Measures, p. 6-131)

ISSUE HERITAGE PROTECTION	PROJECT ACTIVITY Source of impact (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
	CONSTRUCTION OF DAM Height of concrete vertical plane (42 metres) (RSW 2010, 3.2.2 Barrage [Dam], p. 24)	VISUAL ENVIRONMENT Permanent change to physical appearance of natural terrain (RSW 2010, 6.1.2. Végétation [Vegetation], p. 68)	Permanent introduction	HUMAN ENVIRONMENT	MITIGATION MEASURE Develop a fresco and superimpose a sculpture (RSW 2010, 6.3.3.2 Impacts et mesures d'atténuation [Mitigation impacts and measures], p. 104)
PROTECTION OF PHYSICAL APPEARANCE	MANAGEMENT OF LANDFILL SITE Maximum height of piled residual materials is 5.2 metres (Kativik 2014, 14.1.8. Berm Construction, p. 52)	VISUAL ENVIRONMENT Fill to be higher than natural ground level (Kativik 2014, 14.2.1. Soil, p. 54)	ENVIRONMENT Deterioration of landscape aesthetics (Kativik 2014, 5.2 Visibility, p. 25)	HUMAN ENVIRONMENT	MITIGATION MEASURE The construction of berms hides operations in the most active zone of the landfill, namely the household residual materials zone (Kativik 2014, 14.2.9. Landscape, p. 64)
APPEARANCE OF LANDSCAPE	MANAGEMENT OF RESIDUAL MATERIALS Scattering of wind-blown waste (Kativik 2014, 14.1.9. Litter, p. 52)	VISUAL ENVIRONMENT Temporary change to physical appearance of natural terrain (Kativik 2014, 14.2.1. Soil, p. 54)		HUMAN ENVIRONMENT	MITIGATION MEASURE Regular maintenance to keep wind-blown litter to a minimum (Kativik 2014, 14.2.9. Landscape, p. 64)
	FIT-UP OF MINING SITE Height of waste rock pile (planned at 20 metres) (WSP 2015, 5.13.2 Waste Rock Pile, p. 42)	VISUAL ENVIRONMENT Temporarily higher than natural ground level (WSP 2015, 7.1.2 Components of the Environment, p. 59)	field (WSP 2015, 7.1.2	HUMAN ENVIRONMENT	MITIGATION MEASURE Limit the height of the pile so that works can be better integrated in the surrounding landscape (WSP 2015, 7.1.2 Components of the Environment, p. 59)

ISSUE HERITAGE PROTECTION	PROJECT ACTIVITY Source of impact (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	` '	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
LANDSCAPE AS TOURIST ATTRACTION	OPERATION OF MINING SITE Light emissions from mining site (SNC-Lavalin 2015, 5.4.13.5 Infrastructure Visibility, p. 5-414)		PINGUALUIT NATIONAL PARK Aesthetic nuisance for tourists to Pingualuit National Park (SNC-Lavalin 2015, 5.4.13.5 Infrastructure Visibility, p. 5-414)	DISRUPTION TO TOURIST EXPERIENCE OF PINGUALUIT NATIONAL PARK	MITIGATION MEASURE Understand impacts felt in Pingualuit National Park due to the operation of the Raglan Mine (SNC-Lavalin 2015, Table 6-22 Overview of Key Initiatives, p. 6-78)

ISSUE INTERCOMMUNITY SOCIAL RELATIONS AND WAY OF LIFE IN INUIT COMMUNITIES	PROJECT ACTIVITY Source of impact (Reference)	BIOPHYSICAL ENVIRONMENT COMPONENT Change to component (Reference)	HUMAN ENVIRONMENT COMPONENT Change to component (Reference)	SOCIAL IMPACT	MITIGATION OR IMPROVEMENT MEASURE Description of measure (Reference)
INTERCOMMUNITY RELATIONS BETWEEN INUIT AND	WORKERS' RECREATIONAL ACTIVITIES Sport fishing (WSP 2015, 7.4.1 Inuit Land Use, p. 71)	AQUATIC FAUNA Pressure on fish populations in lakes near the mining site (WSP 2015, 7.4.1 Inuit Land Use, p. 71)	Disturbance of Inuit fishing habits near these lakes (WSP 2015, 7.4.1		MITIGATION MEASURE Establishment of a sport fishing program that facilitates management of this activity near the mine (WSP 2015, 7.4.1 Inuit Land Use, p. 71)
BETWEEN INUIT AND NON-INDIGENOUS PEOPLE	WORKERS' RECREATIONAL ACTIVITIES Sport fishing in Deception Bay (SNC- Lavalin 2015, 5.4.11.1 Recreational Fishing by Raglan Mine's non- Inuit Employees, p. 5-400)	AQUATIC FAUNA Reduction of populations of certain species of fish in Deception Bay (SNC-Lavalin 2015, 6.3.2.2.2 Deception Bay, p. 6-60)	for the Arctic char fishery, a species of interest to the Inuit. (SNC-Lavalin 2015, 6.3.2.2.2.2 Impact	NON-INDIGENOUS	MITIGATION MEASURE Ensure that fishing by non-Inuit people does not interfere with Sallumiut activities on an annual basis (SNC-Lavalin 2015, 6.3.2.2.2.3 Specific Mitigation Measures, p. 6-61)
CHANGE IN WAY OF LIFE OF INUIT FAMILIES	PERSONNEL MANAGEMENT Planning of schedules and rotation weeks (SNC-Lavalin 2015, 5.4.5.4 Culture at the Raglan Mine Workplace, p. 5-268)		FAMILIES Separation of Inuit workers from their families (SNC-Lavalin 2015, 6.4.2.2.2 Impact Description, p. 6-91)		MITIGATION MEASURE Expand possibilities for family support and make social and psychological services available to new Inuit employees (SNC-Lavalin 2015, 6.4.2.2.4 Mitigation Measures, p. 6-108)