



Public Services and
Procurement Canada

Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec)

Environmental Impact Statement PART G – Follow-up and Monitoring Programs

Chapter 22 Monitoring

Chapter 23 Follow-up





PUBLIC SERVICES AND PROCUREMENT CANADA

Environmental Impact Statement Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec)

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PART G – MONITORING AND FOLLOW-UP PROGRAMS

The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of the Project, and to provide defined action plans and emergency response procedures to protect human and environmental health and safety.

The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the Project. According to the guidelines, the elements considered in developing the follow-up program are:

- Whether the Project will affect environmentally sensitive areas and/or valued components, protected areas or areas under consideration for protection;
- The nature of concerns raised by Indigenous groups and the public about the Project;
- Indigenous groups input into the design of, and participation in, follow-up and monitoring programs;
- The incorporation of Indigenous knowledge;
- The accuracy of predictions;
- Whether there is a question about the effectiveness of mitigation measures, or whether PSPC proposes to use new or unproven techniques and technologies;
- The nature of the cumulative environmental effects;
- The nature, scale and complexity of the program;
- Where there is limited scientific or local knowledge of environmental effects in the environmental assessment.

22 MONITORING

The environmental monitoring program covers all phases of the Project, but particularly the construction phase where the majority of effects are anticipated. Some measures applicable during construction will also be required during routine maintenance operations throughout the life of the dam or in emergency situations such as an accidental spill.

The terms of the preliminary environmental monitoring program include:

- The identification of interventions that involve risks to one or more of the environmental and/or valued components and the measures and means envisaged to protect the environment;
- Identification of regulatory instruments that include a required monitoring program for the valued components;
- A description of the characteristics of the monitoring program, where foreseeable;
- A description of the mechanisms for responding to findings of non-compliance with legal and environmental requirements or obligations imposed on contractors by the environmental provisions of their contracts;
- The procedures for producing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned;
- The participation of Indigenous groups in the monitoring process.

22.1 GENERAL MONITORING PLAN

All of the proposed mitigation measures (Tables 18.1, 19.1 and 20.1) will be subject to environmental monitoring during construction. Environmental site supervisors will be mandated by PSPC to carry out the monitoring of the construction activities. SART communities mentioned their interest to participate in the construction monitoring. AN and AOPFN mentioned that they would like to be involved in the long-term monitoring of water quality, fish and fish habitats, and also to be involved in the development of the fish compensation program and its follow-up. In addition, several communities expressed their interest in participating in the development of the revegetation plan for the island and its shores following the construction and its follow-up. Also, the MNO requires involvement in the noise monitoring plan.

As a first step, these mitigation measures, as well as those from the DFO authorization, will be incorporated into the specifications so that the contractor can integrate them into work methods. The contractor is responsible for implementing the mitigation measures included in the specifications. The contractor is also responsible for selecting work methods on how they will achieve the results targeted by these measures.

PSPC is the ultimate respondent for compliance with mitigation measures and commitments to Indigenous groups and stakeholders. To ensure compliance with mitigation measures during construction, PSPC will mandate an environmental supervisor(s) that will be present at all times on the site to ensure compliance with these measures. Contractual clauses will allow the supervisors to intervene by issuing statements of deficiency or penalties when the measures are not adequately applied or when they prove insufficient to mitigate the effects. Site reports will be produced on a daily basis and an annual report will be submitted to PSPC, the Indigenous groups, DFO and the Agency. A partial report may also be submitted at the end of each of the four phases of work. It should be noted that some mitigation measures are the PSPC's responsibility (e.g. archaeology) and therefore, will not be delegated to the contractor nor included in the contractual clauses. PSPC will prepare reports on these measures and will forward them to the Indigenous groups, DFO and the Agency.

A general Environmental Management Plan (or Project Environmental Protection Plan) for the construction period will be prepared by the contractor and submitted to PSPC environmental supervisor for comments and approval. This plan will also be shared by PSPC to Indigenous groups for their review. All comments will be forwarded to the contractor to be addressed in a final version. The Environmental Management Plan will include specific plans such as, but not limited to:

- Erosion and Sediment Control Plan;
- Spill prevention and Response Plan;
- Invasive alien plant species (IAS) Management Plan;
- Wildlife-management Plan;
- Waste Water Management Plan;
- Waste Management Plan.

For the operation period, the Operational Management Plan that already exists will be bonified with the measures included in the EIS if needed.

If the results of these different monitoring plans show that the real impacts are different from those anticipated and the mitigation measures are not sufficient, other or additional mitigation measures will be put in place (adaptive mitigation strategy).

22.2 GHG MONITORING PLAN

The GHG monitoring program has been established on a preliminary basis. The method used for the GHG emissions inventory is essentially based on monitoring of machinery operations and road transportation.

The roles and responsibilities for information management will be shared between PSPC and its representatives (collection, compilation and archiving of operational data) and the analysts (GHG emissions inventory). As PSPC will explore options for carbon neutrality for this Project, the data gathered will be used to determine the final emission of the project.

Table 22.1 presents the GHG monitoring plan that will be applied during construction.

Table 22.1 Project GHG Monitoring Plan During Construction

Parameter	Objective	Unit	Monitoring method	Frequency of monitoring	Method of storage	Quality assurance and control
Fuel consumed by machinery	Measure the amount of fuel used for construction work	Liters	Follow-up with subcontractors	Monthly follow-up with annual compilation	Electronic	Cross-checking according to the hours of operation recorded in the logbook
Road transport distance	Measure the distances travelled by road transport trucks (backfill, concrete, steel, etc.)	Kilo-meters	Record of receipt or delivery of materials	At each reception	Electronic	Cross-checking according to distances and theoretical quantities

22.3 NOISE MONITORING PLAN

As a first step, a new modeling will be done before construction in order to take into account the method chosen by the contractor and the equipment that will be used. This will allow to confirm the noise levels and to adjust, if necessary, the mitigation measures that will have to be implemented on site.

Thereafter, noise measurements will be carried out regularly by a specialized firm, in order to confirm in real construction conditions, the noise levels reached during the different phases of the work at sensitive sites. Given the long duration criteria of the Health Canada guide, only a minimum of 24 hours monitoring for the noisy phases will be appropriate for the monitoring. The thresholds are those provided in Section 11.2.1.3.2.

22.4 WATER QUALITY MONITORING PLAN (SS AND OTHER PARAMETERS)

DFO suggests, for the deconstruction of the Champlain bridge, in Montreal, that the following criteria for the increase in suspended solids (SS) during in-water work be respected: SS at 100 m must respect a maximum increase of 25 mg/l compared to the current situation and SS at 300 m must respect a maximum increase of 5 mg/l compared to the current situation, for more than six consecutive hours. The same criteria will be used for the Timiskaming Project. These criteria are based on the Quebec and Canada criteria¹.

In order to assess whether the modeling predictions are reliable and whether the reality in the field is similar to the predictions, three stations positioned on two transects, one at 100 m and the other at 300 m downstream of the cofferdam, will be monitored (see Figure 11.9). A control station will also be positioned upstream of the dam.

¹ [Citères de qualité de l'eau de surface \(gouv.qc.ca\)](http://gouv.qc.ca) and CCME - Conseil canadien des ministres de l'environnement - 2002 - 1999 (mise à jour en 2002) *Recommandations canadiennes pour la qualité des eaux : protection de la vie aquatique : Matières particulières totales*, Winnipeg - Le Conseil - [Recommandations canadiennes pour la qualité des eaux : protection de la vie aquatique - Matières particulières totales \(ccme.ca\)](http://ccme.ca)

- At least one reference station (control station), located in a sector not affected by the construction (and situated upstream of the Quebec dam), must make it possible to monitor ambient levels at the same time as the surveys conducted downstream of the work. This station must have the same characteristics (depth, current, substrate, etc.) as the sector affected downstream of the construction;
- At least three monitoring stations positioned along transects at 100 m and 300 m in the dispersal plume downstream of the construction;
- To ensure that the monitoring stations are positioned in the dispersion plume, the direction of flow must be considered;
- SS monitoring is performed by measuring turbidity with a turbidimeter. The turbidity data obtained (in NTU) are transformed into SS concentrations (mg/L) using the previously established turbidity-SS correlation curve;
- Each turbidity measuring station shall:
 - Have a turbidity meter with sufficient range to cover the full range of values likely to be observed at the work site and with an accuracy of $\pm 2\%$ or ± 0.2 NTU or better;
 - Measure turbidity continuously (recording one reading per minute on a data logger) at each control and exposure station;
 - Be connected to a cellular (or other) communication system that allows real-time data viewing. PSPC and local Indigenous groups must have access to real-time data;
 - Save the daily data file (1 data per minute) on a FTP, SharePoint or other platform that allows PSPC and local Indigenous groups to access the data files at any time.
- For depths greater than 3 m, turbidity measurements shall be taken at 1 m below the surface and 1 m above the bottom. For depths less than 3 m, a single turbidity measurement is taken at 50% of the depth;
- At each of the exposed stations, the average SS concentration value is calculated for each water depth (e.g., at 1 m below the surface and 1 m above the bottom), by the geometric mean of the per-minute data generated over the daily work period or over a period of six consecutive hours if the work is continuous;
- When the average SS concentration value measured during the work is greater than the target SS concentration 100 m downstream of the work for more than six consecutive hours, the Contractor shall:
 - Temporarily stop work generating SS to review work practices to limit sediment resuspension;
 - Apply mitigation measures to limit sediment resuspension when work resumes;
 - As soon as SS levels return to ambient levels or when the 25 mg/l SS concentration can again be respected, work can resume, ensuring that it is carried out properly and that the targeted concentrations are respected.
- The deadline for applying the necessary corrections to return to ambient SS levels or to respect the 25 mg/l SS concentration is immediate;
- The same equipment must be used throughout the monitoring period or it must be replaced by an identical equipment or one with the same characteristics in case of malfunction.

An additional monitoring tool must be kept on the site for fast replacement in case of failure. A boat must be kept on the site at all time to access the deficient equipment and replace it. This boat will also be used to check the integrity of the turbidity curtain. This boat (and fishing gear equipment) will be kept near the site during all construction time. During the concrete construction work (construction and demolition), if fish comes to the surface, they will be captured and relocated upstream or downstream of the isolated working areas.

22.5 SEDIMENT CHARACTERIZATION PROGRAM

A characterization of visible sediment, if any, will be conducted by divers in the area between the turbidity curtain and the current dam once the existing dam is closed and the turbidity curtain is in place and before the construction of the cofferdam, to determine its quality and manage it based on its level of contamination before the cofferdam is constructed. If the sediments are contaminated, a protocol will be developed to recover them before the cofferdam is built.

The methodology to be used to sample and analyse sediments are based on the ECCC and MDDEP guidelines.⁴ The samples will be analyzed by an accredited laboratory and the results will be compared to ECCC and MELCC Guideline: *Critères pour l'évaluation de la qualité des sédiments au Québec et cadres d'application: prévention, dragage et restauration*.⁵ This set of criteria is a screening tool for assessing the degree of contamination of sediment. These criteria aim at protecting aquatic life and permit to determine the level of effects on aquatic life. Parameters that will be analyzed are: metals (including mercury), PCBs, PAHs, C₁₀-C₅₀ hydrocarbons, TOC, particle size. Since the sediments will be managed in a terrestrial environment, the results will also be compared to the MELCC's Intervention Guide criteria⁶.

⁴ Environnement Canada (EC). 2002a. Guide d'échantillonnage des sédiments du Saint-Laurent pour les projets de dragage et de génie maritime. Volume 1 : Directive de planification. Environnement Canada, Direction de la Protection de l'Environnement, Région du Québec, Section innovation technologique et secteurs industriels. 106 pages.

Environnement Canada (EC). 2002b. Guide d'échantillonnage des sédiments du Saint-Laurent pour les projets de dragage et de génie maritime. Volume 2 : Manuel du praticien de terrain. Environnement Canada, Direction de la Protection de l'Environnement, Région du Québec, Section innovation technologique et secteurs industriels. 107 pages.

Ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP). 2008. Guide d'échantillonnage à des fins d'analyses environnementales: Cahier 1 - Généralités. Québec: Centre d'expertise en analyse environnementale du Québec, 58 pages.

Ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP). 2010. Guide d'échantillonnage à des fins d'analyses environnementales: Cahier 5 - Échantillonnage des sols. Québec: Centre d'expertise en analyse environnementale du Québec, 57 pages.

⁵ Environnement Canada et ministère du Développement durable, de l'Environnement et des Parcs du Québec, 2007. Critères pour l'évaluation de la qualité des sédiments au Québec et cadres d'application : prévention, dragage et restauration. 39 pages.

⁶ [Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés \(gouv.qc.ca\)](http://gouv.qc.ca)

23 FOLLOW-UP

In accordance with the guidelines, the preliminary follow-up program includes the following elements:

- The objectives of the follow-up program and the valued components covered by the program;
- A list of the elements requiring monitoring;
- The number of follow-up studies planned and their main characteristics (list of parameters to be measured, projected completion schedule, etc.);
- The intervention mechanism implemented in case of observation of unforeseen environmental degradation;
- The procedures for producing monitoring reports (number, content, frequency, format, language) that will be sent to the authorities concerned;
- The mechanism for disseminating the results of the monitoring to the communities concerned;
- The accessibility and sharing of data with the Indigenous groups, local communities and stakeholder groups;
- The possibility for PSPC to include the participation of Indigenous groups and stakeholders in the affected territory during the development and implementation of the program;
- The involvement of local and regional organizations in the design, implementation, evaluation of the results of the follow-ups and their updating, including a communication mechanism between them and the proponent.

The duration of the follow-up program is established to allow for the evaluation of the effectiveness of the mitigation measures.

Several Indigenous groups have expressed their interest in participating in the various follow-ups that will be carried out and PSPC is in favour of this participation. The details of the involvement of each community will be clarified with them before the beginning of the construction. In general, the follow-up reports will be prepared following each follow-up and will be transmitted to the Indigenous groups, DFO and the Agency and to any other organization/municipality that would like to see them. The Project website could be used for this dissemination.

23.1 MONITORING THE USE OF EXISTING SPAWNING GROUNDS DURING CONSTRUCTION

As mentioned in Section 12.2, some of the spawning grounds present downstream will be directly encroached upon by the cofferdam or rendered inaccessible (area dewatered by the cofferdam). Other spawning grounds or portions of spawning grounds downstream will be partially encroached upon; and there will be changes in current velocities which could also modify the spawning habitat.

Phase 1 will take place in the fall therefore affecting fall spawning of the Lake Whitefish. It should be noted that no spawning grounds specific to whitefish have been identified during the various studies.

Phases 2 and 3, the west bank of the river downstream of the dam will be opened and the east bank will be closed by a sheet pile cofferdam. The velocities in the west bank section in the spring will be modified compared to the situation before the construction. These effects will occur in the spring of the second year and may affect spring spawning species that spawn in whitewater.

Although the hydraulic simulations show that no modification of the hydraulic conditions of the spawning grounds along the east bank of the river, downstream from the mouth of Gordon Creek, will occur, a follow-up investigation appears necessary to confirm the simulations.

The monitoring will therefore aim to determine whether spawners frequent the spawning grounds downstream of the cofferdam. The monitoring will take place in both fall and spring, targeting species that spawn at these times, and will be carried out using the same methods as the 2021 inventories, with nets, fyke nets and egg collectors, in order to capture both spawners and eggs. This data can be compared to the 2021 surveys (for spring) and the 2017 surveys (for spring and fall).

As it is possible that fish use spawning grounds on the Ontario side more during this period as they may be more suitable to their needs, the monitoring will integrate spawning grounds developed downstream of the Ontario dam.

23.2 FISH HABITAT COMPENSATION PROJECT FOLLOW-UP

DFO's Authorization typically includes requirements for monitoring the fish habitat compensation program. Fish habitat must be stable (physical integrity) and effective (biological use by fish). Monitoring is generally required over 5 years, with surveys in years 1, 3 and 5, allowing for adjustments to be made following the initial monitoring.

The monitoring will therefore include a physical survey of the developed spawning grounds (maintenance of the substrate in place, current velocity measurements, bathymetry of the area) and a biological survey (fishing to demonstrate use as spawning grounds, using fishing gear to capture spawners and egg collectors to harvest eggs).

23.3 MONITORING OF REVEGETATION ON THE BANKS AND ON THE ISLAND

Following the realization of the revegetation plan, which will have been developed in conjunction with the Indigenous groups, a three-year follow-up will be carried out. This will aim, among other things, to evaluate the success of the planting and seeding of the selected species, the absence of invasive species as well as the use by certain wildlife species. The objective is to improve the habitat that was there before the Project.

23.4 MONITORING THE USE OF THE FISHWAY

In the event of the construction of a fishway specific to eels or multi-species, its use will be monitored in order to validate its efficiency and to make the required adjustments if necessary. Monitoring could be done using a camera equipped counter installed at a strategic location of the fishway that allows the detection of the number of fish and the species. Monitoring should also include visual or underwater camera inspections to detect possible congregations at the downstream entrance of the fishway and without detection of fish in the fishway itself, which could highlight a problem in using the fishway. This downstream sector should also be made inaccessible to fishermen and a sign could be installed nearby to prohibit fishing.

The overall follow-up of this mitigation measure will have to be discussed with DFO and Indigenous groups, following the decision to choose one or the other of the four options presented.

23.5 MONITORING THE USE OF THE BAT ROUSTING SITE DURING THE WORK

Considering the presence of a bat roosting site a short distance upstream from the dam, a follow-up is required to ensure that the noise and lighting of the work site does not harm the species present. The details of this follow-up should be discussed with the Indigenous group that conducted the inventories in 2021.

23.6 WILDLIFE MORTALITY MONITORING

Since the increased traffic around the work area is likely to cause collisions with wildlife, a follow-up of mortalities will be carried out throughout the construction period. The first step will be to compile a list of accidents and the species involved, and then, if this mortality proves significant, to implement other measures to minimize collisions.

23.7 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM (ESMP)

The Environmental and Social Management Plan (ESMP) is a tool that aims to guide the implementation of the project. It describes the measures, actions and means that will be implemented to prevent and mitigate negative environmental impacts related to the project, but also to enhance benefits or positive impacts. It also aims to ensure that PSPC's commitments to environmental requirements related to the project are met through an environmental and social monitoring program.

The ESMP allows for quick response to environmental disturbances, by putting in place appropriate measures or additional measures to mitigate or compensate for impacts that would not have been foreseen in the impact statement.

PSPC will be responsible for implementing the ESMP, reviewing it to ensure its relevance and effectiveness, and reporting on it. During the construction period, the implementation of the ESMP will be carried out by the prime contractor and its suppliers in collaboration with the various authorities under the contractual conditions established by PSPC.

The environmental and social responsibilities of the ESMP implementation must be assumed by all stakeholders in the realization of the project. Thus:

- PSPC is committed to government authorities to implementing the ESMP. PSPC is therefore responsible for the overall monitoring of the implementation of the project and compliance with environmental and social requirements. It must provide the necessary resources and support to ensure that environmental and social commitments are met. To achieve this, it must ensure that the human and material resources in place are sufficient to guarantee compliance with commitments;
- Implementation (whether through PSPC, the dam operators, a single supplier, or multiple suppliers) will address design, engineering, procurement of permanent materials and equipment, logistics, construction contract management and quality assurance. It includes support services to PSPC such as environmental services and environmental monitoring;
- Prior to construction activities, ensure that the environmental and social requirements contained in the ESMP are included in the drawings and specifications and translated into contractual clauses in the various tender documents between the contractor and PSPC. PSPC will also be responsible for requesting authorizations from the appropriate authorities (although the contractor will be responsible for obtaining specific authorizations resulting from its method of work);
- The contractor selected following the tendering process will be responsible for carrying out the work, including: preparatory work, construction and rehabilitation. The prime contractor therefore bears most of the responsibility for the environmental and social management of the construction site. In order to ensure compliance with the ESMP, the contractor must adequately train and inform workers and suppliers when arriving on construction site of any environmental and social issues, mitigation measures and environmental procedures in place. It is also responsible for identifying the environmental issues of each work package and implementing the mitigation or compensation measures that have been agreed on;
- PSPC remains responsible for ensuring that the ESMP is implemented by the dam operators during the operation phase. The latter will be responsible for the maintenance program and the refurbishment of equipment as required.

23.7.1 Management Plans

The ESMP is divided into different management plans for activities or components that deserve special attention because of the issues and requirements associated with them. A specific table will be prepared for each selected activity or component which will describe the measures, who is responsible for implementing it and the means to verify the measure implementation.

The content of the management plans will be presented in individual tables and some will be used in the terms of reference and the environmental specifications that will be appended to the contractor's contract. The content of the environmental specifications will be revised, as required, to include comments and recommendations from authorities when issuing permits and authorizations. These plans will also be revised as necessary once the detailed engineering is completed.

Management plans are grouped into three categories:

- **Project Environmental Protection Plan**, which will include communications with Indigenous groups and stakeholders, complaint management process, community benefits, health and safety plan for construction employees and workers, and local populations (Indigenous and non-Indigenous);
- **Management plans for specific work or activities** such as clearing and stripping, in-water work, site reclamation, waste management, hazardous materials management, erosion and sediment control, waste water, waste management, spill prevention and response, etc.;
- **Management plans for specific environmental components** (physical, biological or human environments), such as but not limited to:
 - Air quality;
 - Greenhouse gas emissions;
 - Soundscape;
 - Surface water;
 - Groundwater;
 - Soil;
 - Sediments;
 - Protection and restoration of vegetation cover;
 - Invasive alien plant species (IAS);
 - Fish and fish habitat;
 - Wildlife-management;
 - Socio-economic management.

An example of an air quality management plan is presented below. All other management plans will be prepared prior to the call for tenders in a similar format. The outline of the socio-economic management plan is presented in Section 22.7.1.2.

23.7.1.1 [Air Quality Management Plan](#)

The purpose of this air quality management plan is to allow the implementation of mitigation measures to reduce the impact of the Project activities on the air quality during the construction phase. The air quality management plan focuses mainly on atmospheric emissions related to the handling of aggregates and materials, machinery operations, and transport truck traffic. These activities involve atmospheric emissions of gaseous and particulate contaminants, such as total suspended particulates (TSP), particulate matter (PM₁₀, PM_{2.5}), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and greenhouse gases (GHGs).

Table 23.1 summarizes the proposed mitigation measures that may be implemented to manage the impact of the Project on local air quality.

Table 23.1 Air Quality Management Plan

Potential Sources of Air Emissions	Contaminants	Proposed Mitigation Measures	Timing	Accountability	Mean
All activities	Dust	<ul style="list-style-type: none"> - Visual inspection and monitoring of dust emissions on and around the Project site should be carried out on a regular basis (i.e. daily or weekly) - Activities involving significant emissions of dust, or causing nuisance due to air emissions, should be identified, and mitigation measures should be implemented if necessary (i.e. dust clouds reaching privately owned or publicly accessible areas) - Complaints from neighbours regarding dust or air quality should be registered, analyzed, and addressed with the adequate mitigation measures 	Project duration	Contractor	Visual inspection Complaints follow-up and results
Dust emissions from unpaved roads	Dust	<ul style="list-style-type: none"> - Limit speed to 20 km/h on on-site roads - Applying water-based suppressants to exposed road surfaces that are causing dust emissions - Sweeping the access roads and circulation areas 	When required	Contractor	Visual inspection
Dust emissions from public paved roads	Dust	<ul style="list-style-type: none"> - Prevent dirt track-out from the Project site to the public road network, using track-out grates or other technology 	Project duration	Contractor	Visual inspection
Stockpile sites	Dust	<ul style="list-style-type: none"> - Applying water to stockpiles that are causing dust emissions due to wind erosion - Cover stockpiles that are causing dust emissions due to wind erosion 	When required	Contractor	Visual inspection
Machinery operations	Dust	<ul style="list-style-type: none"> - When available, dust control systems such as wet suppression systems (water sprays) and enclosures should be used. This applies most notably to drilling, crushing, and screening activities 	Project duration	Contractor	Visual inspection
Exhaust emissions of diesel machinery and trucks	SO ₂ NO _x CO PM _{2.5} GHGs	<ul style="list-style-type: none"> - Off-road construction equipment and on-road transport truck engines would be required to meet the latest Tier 4 emission standards of the U.S. Environmental Protection Agency (EPA) - Machinery and transportation trucks should be well maintained and kept in good working condition - Manage loading and unloading activities to minimize idling time - Shut off engines when truck or vehicle is stopped for extended periods of time 	Project duration	Contractor	Visual inspection
Transportation of soil, aggregates, and other materials	Dust	<ul style="list-style-type: none"> - Cover loads on trucks transporting materials to and from the site 	Project duration	Contractor	Visual inspection

23.7.1.2 Socio-Economic Management Plan

23.7.1.2.1 Introduction / Approach

The purpose of this socio-economic management plan is to summarize socio-economic mitigation and enhancement measures and to communicate, to Project personnel, contractors, Indigenous groups and stakeholders, in a clear and concise manner, PSPC policies, programs and measures. These policies, programs and measures are to be implemented during pre-construction and construction of the Project to avoid or reduce potential adverse socio-economic effects and to maximize Project-related economic and community opportunities or benefits. In addition to the socio-economic management plan, an Indigenous Participation Plan (IPP) will be included in the bid solicitation documents. The IPP details how a bidder proposes to generate socio-economic benefits for Indigenous groups and business communities. An IPP is separate from the socio-economic management plan and may address employment, training, skills development, equitability, and sub-contracting.

As defined under the *CEAA, 2012*, mitigation measures are defined as measures used to eliminate, reduce, or control a project's adverse effects, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means. This definition also applies to reducing or managing a project's adverse socio-economic effects. For the purposes of this assessment, enhancement measures are defined as recommendations that aim to promote the likelihood of potential positive environmental or socio-economic residual effects.

Table 23.2 summarizes the proposed mitigation and enhancement measures that have been designed to manage potential social, cultural, land and resource use, economic, and health-related issues and economic opportunities associated with the Project.

Table 23.2 Proposed Mitigation and Enhancement Measures

Potential effects	Proposed mitigations or enhancements
Direct and indirect employment and business opportunities	<ul style="list-style-type: none"> - Prioritize local and Indigenous service providers and workers to optimize direct and indirect employment in the region - Encourage joint ventures when local capacity does not exist to create benefits for local and Indigenous communities - Ensure equal pay and employment opportunities - Encourage contractor to use qualified local and Indigenous-owned services
Skills and capacity development	<ul style="list-style-type: none"> - Develop IPP to support economic benefits, and to encourage contractors to provide training and apprenticeship opportunities - Support environmental monitoring training to local, impacted Indigenous groups - Support creation and long-term sustained use of local Indigenous guardianship initiatives - Share monitoring results with Indigenous and non-Indigenous communities - Implement measures through IPP to ensure opportunities for local Indigenous groups to benefit
Barriers to employment	<ul style="list-style-type: none"> - Institute a zero-tolerance policy for racism and sexism - Provide cultural awareness and sensitivity training - Monitor Indigenous women and marginalized worker concerns and respond to issues as they arise - Institute confidential whistle-blower / grievance system for the workplace - Encourage implementation of workplace diversity measures and incentives - Discuss and address barriers to employment during development of Indigenous Participation Plan

Potential effects	Proposed mitigations or enhancements
Decreased access to cultural events due to employment	<ul style="list-style-type: none"> - Provide cultural awareness and sensitivity training - Discuss cultural leave, and flex scheduling with Indigenous employees - Encourage wellness and family leave policies - Implement measures through IPP
Increased land use by non-Indigenous workers	<ul style="list-style-type: none"> - Give preference to local and Indigenous workers to minimize changes to harvesting - Provide cultural awareness and sensitivity training - Ensure all workers are aware of, and follow, provincial rules and regulations regarding hunting and fishing; work with provincial conservation officers to monitor/enforce rules
Increased use of local businesses by construction workforce	<ul style="list-style-type: none"> - Encourage non-local workers to stay in local accommodations and use local businesses and services - Discuss workforce needs with local business organizations (Chambers of Commerce, etc.) so that they may provide goods and services that are needed / wanted by the workers
Disruption of community life due to construction activity and temporary workers	<ul style="list-style-type: none"> - Provide information about peak season availabilities to contractor to ensure best use of local temporary accommodations - Encourage renting local housing rather than using hotels and local campgrounds and other tourism-based accommodations - Request listing of local accommodation establishments, number of rooms and that are willing to provide long-term rentals - Liaise with hotel owners in advance of construction to secure the needed Project accommodation, if required - Create short-term accommodations (work camp / trailers) on vacant lands rented from willing local municipal, Indigenous or private property hosts, if required - Provide community orientation to workers and contractors stressing requirement for respectful behaviour and use of community facilities - Ensure adherence to contractor health, safety, and environmental policies - Institute zero-tolerance policy for inappropriate behaviour on the job and in communities, where appropriate - Communicate early and regularly with contractor, local police, social services, and municipalities to establish working relationships and ongoing exchange of information, incident tracking, corrective actions, and other strategies, as required
Change in population and demographics during construction	<ul style="list-style-type: none"> - None proposed
Increased demand on health care facilities during construction	<ul style="list-style-type: none"> - Ensure contractors have excellent safety records - Recommend employees access regular medical care in their own communities - Hire locally to avoid pressure on existing medical services by increasing the population - Enforce worksite best practices to reduce spread of contagious disease, as required - Implement testing or vaccination requirements, as required - Deliver a health and safety program for all workers before and during construction employment so that the industry's excellent safety record is maintained - Provide first-aid facilities on site and having first aid responders on site at all times
Increased land use during construction	<ul style="list-style-type: none"> - Give preference to local and Indigenous workers to minimize changes to harvesting - Ensure all workers are aware of, and follow, provincial rules and regulations regarding hunting and fishing; work with provincial conservation officers to monitor/enforce rules

Potential effects	Proposed mitigations or enhancements
	<ul style="list-style-type: none"> - Explore the inclusion of the Kichi-Sibi Guardians in all environmental monitoring plans associated with the Project.
Destruction of archaeological resources on Long Sault Island	<ul style="list-style-type: none"> - Halt activities if any archaeological resources are discovered, protect the site, notify Indigenous groups and relevant authorities (provincial archaeological authorities) - Comply with the Ontario Heritage Act - Involve interested Indigenous groups in archeological studies - PSPC will work with Indigenous groups prior to construction to prepare a protocol for the protection and management of any recovered artefacts based on the archaeological intervention plan (refer to Phase 4). - If artefacts are found, they will be held in trust by PSPC until the protocol can be implemented
Destruction of archaeological resources in Ottawa River	<ul style="list-style-type: none"> - Conduct an underwater archaeological potential assessment (Phase 1), underwater archaeological surveys (Phase 2, if recommended and deemed feasible), an underwater archaeological impact assessment (Phase 3) and develop an archaeological intervention plan (Phase 4) - Comply with the Ontario and/or Quebec Standards and Guidelines for Consultant Archaeologists - Conduct archaeological investigation based on the archaeological intervention plan in the dewatered area once cofferdam installed, document and recovery any archaeological resources, if discovered, to prevent destruction - Involve interested Indigenous groups in archeological studies - PSPC will work with Indigenous groups prior to construction to prepare a protocol for the protection and management of any recovered artefacts based on the archaeological intervention plan - If artefacts are found, they will be held in trust by PSPC until the protocol can be implemented
Conflicts between recreation vehicles and pedestrian traffic on the dam	<ul style="list-style-type: none"> - Install appropriate fencing and signage to limit pedestrian-recreational vehicle conflicts on the walkway
Physical and cultural heritage value of Long Sault Island and Ottawa River	<ul style="list-style-type: none"> - Discuss opportunities with Indigenous groups to re-establishing natural vegetation on Long Sault Island. - Invite Indigenous groups to harvest any trees and plants with cultural value prior to the construction of the new dam. - Involve Indigenous groups in the planning, design, siting, installation and maintenance of a plaque or other permanent structure that provides the history of the Ottawa River and Long Sault Island and its importance to Algonquin cultural and physical heritage. - Respect and allow space for Indigenous groups to conduct cultural ceremonies prior to the construction of the new dam to bring recognition and awareness to the historical alteration of the island and Ottawa River which may subsequently help to heal these historical impacts and build reconciliation with the impacted Indigenous groups.
Lights on dam affecting fish abundance and harvesting	<ul style="list-style-type: none"> - Direct lights toward working area during construction
Perceived/real impacts on fish health due to contaminants	<ul style="list-style-type: none"> - Install turbidity curtain and remove sediments from behind it - Inspect turbidity curtain after it is installed. - Monitor for organic mats downstream of the dam construction site within the Project area and remove if observed - Share information on water/fish quality - Share information on construction/demolition material composition and risks to health - Improve fish habitat through offsets approved by DFO - Involve Indigenous groups in monitoring activities

Potential effects	Proposed mitigations or enhancements
	<ul style="list-style-type: none"> - Include Indigenous knowledge in fish monitoring and species restoration or recovery activities, as appropriate. Include the Kichi-Sibi Guardians in these processes
Changes to access to fishing areas near the dam from fencing and signage	<ul style="list-style-type: none"> - Provide cultural awareness and sensitivity training - Communicate early and regularly with communities about access to fishing areas close to the dam
Loss of fishing equipment from snagging on blocks on dam apron	<ul style="list-style-type: none"> - Investigate alternatives to habitat creation options for the Quebec apron, such as boulders instead of blocks - Use blocks of a different design that are less likely to snag
Loss of fishing habitat and spawning grounds leading to loss of abundance and fishing opportunities	<ul style="list-style-type: none"> - Improve fish habitat through offsets approved by DFO - Collaborate with Indigenous groups to develop a fish habitat compensation and monitoring plan. Include the Kichi-Sibi Guardians in these processes
Fish ladder (for multiple fish species) changing abundance of certain species	<ul style="list-style-type: none"> - Delay fish passage until more information is available about potential impacts and mitigations proposed to address them.
Wildlife mortality from Project activity traffic	<ul style="list-style-type: none"> - Implement traffic control measures at the Project site, for example, speed limits - Monitor wildlife mortality during the Project activities and address issues if mortality rate is high. Include the Kichi-Sibi Guardians in these processes
Changes in health and abundance of wildlife that rely on fish, like muskrat, otter, etc.	<ul style="list-style-type: none"> - None proposed
Impacts of construction noise on wildlife and wildlife habitat	<ul style="list-style-type: none"> - Keep noise pollution to a minimum and establish quiet hours, especially during the night to help provide a more suitable environment for wildlife, where possible (see Section 11.2.3 for more measures related to noise).
Physical removal and/or disturbance of shoreline plants during construction	<ul style="list-style-type: none"> - Invite Indigenous groups to harvest any trees and plants of cultural value prior to the construction of the new dam - Discuss opportunities with Indigenous groups to re-establishing natural vegetation on Long Sault Island which could include the following: <ul style="list-style-type: none"> o Plant new pioneer species in disturbed areas, including thistle, asters, goldenrod, mugwort, dandelion, nettles, sumac, etc., to restore disturbed sites o Discuss a species restoration plan with interested Indigenous communities, which could include a plant re-introduction strategy for all stages of restoration o Make efforts to re-establish the Wolf Willow away from the construction activities on Long Sault Island, so that Indigenous groups can continue to harvest it for medicinal and ceremonial use o Invite Indigenous communities to apply Indigenous knowledge to decision-making to determine which plants to seed, manage, and monitor in the Project footprint o Communicate restoration activities through signage other appropriate communication methods o Restrict access to planting sites while vulnerable to human disturbance o Monitor growth rates of vegetation planted to support restoration and the development of habitat. Include the Kichi-Sibi Guardians in these processes o Include Indigenous groups in monitoring restored plants

Potential effects	Proposed mitigations or enhancements
Reduced harvesting of plants for food and medicine due to actual or perceived contamination of plants and medicines from dust, or plant absorption of chemicals from road runoff, or construction spills.	<ul style="list-style-type: none"> - Manage dust during construction with water - Restore any areas that do become contaminated by spills - Discuss a vegetation restoration plan with Indigenous groups for the Project footprint/construction areas and/or other parts of Long Sault Island - Install silt fence during construction to capture contaminants from running into the Ottawa River - Design roadway to include ditching and sedimentation ponds to capture run-off of contaminants exists currently - Explore the creation of other areas that are accessible for harvesting medicinal plants so the need to harvest on this shoreline is reduced
Avoidance of the Ottawa river due to construction activities that may release contaminants in sediment and from dam construction materials	<ul style="list-style-type: none"> - Monitor water quality changes during the Project activities. Include the Kichi-Sibi Guardians in these processes - Provide water quality data to communities - Provide material safety information about dam components to Indigenous groups
Avoidance of the Ottawa river for drinking, swimming, and bathing because of real or perceived contaminants in sediment and dam construction materials	<ul style="list-style-type: none"> - Monitor water quality changes during the Project activities. Include the Kichi-Sibi Guardians in these processes - Provide water quality data to communities

23.7.1.2.2 Monitoring

Socio-economic effects monitoring is utilized as a management tool to evaluate the effectiveness of mitigation measures, manage unintended socio-economic impacts of a project, and as a means of facilitating ongoing communication with Indigenous groups and stakeholders. Socio-economic monitoring plans are designed to facilitate issues tracking and management regarding the intended and unintended impacts and benefits of a project. They also provide a feedback mechanism to the socio-economic assessor and proponent, which can introduce greater certainty to future socio-economic assessments and inform proponent initiatives on future projects.

The objectives of socio-economic monitoring are to:

- Determine the effectiveness of proposed socio-economic mitigation and enhancement measures during the construction phase;
- Identify strategies to adapt /enhance mitigation, if required;
- Identify and respond to unanticipated socio-economic effects and issues during the construction phase;
- Provide information to regulators, Indigenous groups and stakeholders on actual socio-economic outcomes related to Project construction.

By their nature, socio-economic issues are dynamic and are affected by multiple factors. Whether related to health, employment and business opportunities, or traffic and access, how socio-economic issues impact communities will be determined by a nuanced consideration of Project components, individual choices, broader economic factors and government policies and programs. Socio-economic management and the discussion of mitigation/enhancement measures relies on shared responsibility. The ability and responsibility to address Project-related socio-economic issues lies with a range of individuals, organizations, and governments, in addition to the proponent. Therefore, the successful implementation of a socio-economic management plan will require the collaboration and shared responsibility between PSPC, service organizations, Indigenous groups, and local governments.

Indigenous groups who wish to have an active role in monitoring may discuss their preferences for how and when monitoring will occur with PSPC and document those processes in plans that are specific to each Indigenous group. For example, the AOO has suggested that a committee be established to monitor health, socio-economic and cultural effects.

In particular, the monitoring of socio-economic effects is particularly useful given the ever-changing nature of socio-economic conditions. In addition, there is an associated challenge of predicting socio-economic outcomes related to the Project during the regulatory assessment process. A socio-economic monitoring plan that is designed to track and respond to the interests of Indigenous groups and stakeholders is an important tool for managing non-technical risk.

A primary challenge of socio-economic monitoring is that at any given time, multiple factors that extend beyond the influence of one project, can influence socio-economic outcomes. For example, individual behaviours or perspectives, changing labour market conditions, and other projects can occur at the same time as the Project. It is often difficult to determine which effects are the result of the Project and which are the result of other factors. Other challenges include limited data availability, timing of data releases, and attribution of factors that influence data changes.

Socio-economic monitoring will commence at the start of Project activity and will continue throughout construction. The frequency of monitoring will be established in consultation with Indigenous groups and stakeholders. The socio-economic monitoring geographic scope will be specific to each topic and will be established in consultation with Indigenous communities and stakeholders. Table 23.3 provides an example table that will be completed as a first step in creating a socio-economic monitoring plan. Topics will be identified, in consultation with Indigenous groups and stakeholders, through an analysis of Project effects to determine which residual effects can reasonably be monitored. This will likely include significant and non-significant effects, but not effects that are classified as negligible. Once topics have been identified, potential mitigation measures, timing and accountability will be identified for each topic. Whether PSPC can monitor each topic will be determined and explained. If it is determined that a topic can be monitored, the next step will be to create a process for monitoring each topic. This will include an identification of data sources and thresholds for action for each topic area. The AOO has requested the development of a Project-specific Algonquin Socio-Economic Monitoring, Management, and Mitigation Committee, which would develop and implement an Algonquin Health and Socio-Economic Monitoring Plan to verify and monitor the health and socio-economic impacts of the Project. Based on the impacts identified, this committee would also develop management and monitoring measures to address health and socio-economic impacts as they are identified. The development of the committee will further be discussed in the IPP.

Table 23.3 Monitoring Table by Topic Area (sample) – to be completed before construction

Topic (based on Project effects)	Potential Mitigation Measure	Timing	Accountability	Can PSPC Monitor (y/n)?	If yes, how? If no, why not?