



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

Dumont Nickel Mine Project

Guidelines for the Preparation
of an Environmental Impact Statement Pursuant to the
Canadian Environmental Assessment Act

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LIST OF ACRONYMS

The Agency: Canadian Environmental Assessment Agency

VEC: Valued ecosystem component

HADD: Harmful alteration, disruption or destruction of fish habitat

EC: Environment Canada

EA: Environmental assessment

EIS: Environmental impact statement

GHGs: Greenhouse gases

The Act: *Canadian Environmental Assessment Act*

DFO: Fisheries and Oceans Canada

CEAR: Canadian Environmental Assessment Registry

CSR: Comprehensive Study Report

MMER: *Metal Mining Effluent Regulations*

NRCan: Natural Resources Canada

DISCLAIMER

These Guidelines have no legal standing and are not intended to provide legal advice or guidance. They are offered solely for information purposes and do not replace the *Canadian Environmental Assessment Act* or its associated regulations, or any other federal statute. In the event of a discrepancy, the *Canadian Environmental Assessment Act* and its associated regulations shall take precedence. Parts of the *Canadian Environmental Assessment Act* have been paraphrased in the Guidelines and must not be cited for legal purposes. It may be permissible to deviate from the procedures described in these Guidelines depending on the particular circumstances of a project.

1 INTRODUCTION

1.1 Purpose of the document

The purpose of this document is to describe the various phases in the comprehensive study process in accordance with the *Canadian Environmental Assessment Act* and the information required to prepare the Environmental Impact Statement for the Dumont Nickel Mine Project in the Amos area located in the Abitibi region. These guidelines specify the nature, scope and extent of the information required.

The EIS must present the characteristics and purpose of the project as well as the environment in which the project will be carried out. The EIS will identify the potential adverse environmental effects of the project, including cumulative effects, propose technically and economically feasible measures to mitigate those effects, and evaluate whether the proposed project will result in any significant adverse environmental effects.

It is the responsibility of the proponent to provide sufficient data and analyses on any potential environmental effects of the project to permit proper evaluation by the Canadian Environmental Assessment Agency, expert and regulatory departments, Aboriginal groups and the public. The EIS Guidelines describe the minimum information requirements, but give the proponent the flexibility to choose the most appropriate methods for compiling and analyzing data for the EIS.

1.2 Project overview

The proponent is proposing to develop an open-pit nickel mine 25 kilometres northwest of Amos. The deposit contains 1.4 billion tonnes of measured and indicated resources with an average nickel content of 0.27%. At the end of operations, pit dimensions will be 4.8 x 1.4 kilometres, with a maximum depth of 560 metres.

The ore processing plant will have an initial capacity of 50 000 t/d, but this capacity will increase to 100 000 t/d after five years of operation of the mine. The proponent plans to mine the pit for 19 years and, during this period, a temporary storage pile of low-content ore will be accumulated. At the end of operation of the pit, this pile of 469 million tonnes of low-content ore will be used to supply the concentrator for another 12 years, until the mining complex is closed after 31 years of operation.

In addition to nickel, the proponent will also recover cobalt, platinum and palladium from the ore. The nickel concentrate will be shipped to a smelter. However, this concentrate may also undergo additional processing to produce ferronickel that can be used directly by the stainless steel industry.

1.3 Application of the Canadian Environmental Assessment Act

The Act applies to federal authorities when they contemplate certain actions or decisions in relation to a project that would enable the project to proceed in whole or in part. Under paragraphs 5(1)(a) to (d) of the Act, a federal environmental assessment may be required if a federal authority is the proponent of a project, provides financial assistance to the proponent, provides access to federal lands for the purposes of the project or issues a permit, licence or any other approval concerning one of the provisions listed in the *Law List Regulations*.¹

The Act applies to the Dumont Nickel Mine Project since, on the basis of the information received from the proponent, the following federal authorities may have to issue authorizations and approvals:

- Fisheries and Oceans Canada pursuant to subsection 35(2) of the *Fisheries Act*;
- Natural Resources Canada pursuant to subsection 7(1) of the *Explosives Act*;
- The Governor in Council may have to issue a decision concerning the amendment of the *Metal Mining Effluent Regulations* to authorize the deposit of tailings in a body of water frequented by fish. Such an amendment is required in order to list a body of water as a tailings impoundment area in Schedule 2 of the MMER pursuant to paragraphs 36(5)(a) to (e) of the *Fisheries Act*.

The Agency has determined that the project must be subject to a comprehensive study since components of the project, as proposed by the proponent, are described in the following sections of the *Comprehensive Study List Regulations*:

- 10. “The proposed construction, decommissioning or abandonment of a facility for the extraction of 200 000 m³/a or more of ground water or an expansion of such a facility that would result in an increase in production capacity of more than 35 per cent.”
- 16. “The proposed construction, decommissioning or abandonment of:
(a) a metal mine, other than a gold mine, with an ore production capacity of 3 000 t/d or more.”

This project is a resource project involving the Major Projects Management Office, which will be kept informed of the progress of the work throughout the EA process.

1.4 Comprehensive study process²

In accordance with section 11.01 of the Act, the Agency will perform the duties and functions of the responsible authority in relation to the environmental assessment of the Dumont Nickel Mine Project. The Agency will work closely with the federal authorities to coordinate their participation in the environmental assessment process and facilitate communication and cooperation between them and the other participants for the purpose of

¹ See Appendix 1 for the guiding principles of the environmental assessment process.

² See Appendix 2 for flow charts of the comprehensive study process and the public consultation process.

preparing the CSR. During the process, the Agency will provide the public and Aboriginal communities with various consultation opportunities.

To perform the analysis of the project, the Agency has established a federal environmental assessment committee (federal committee)³ composed of representatives of Fisheries and Oceans Canada, Environment Canada and Natural Resources Canada. Representatives of other departments may be added if necessary.

The federal committee has established the scope of the environmental assessment to guide the analysis of the proponent's EIS. The proponent will submit its environmental impact statement assessing the environmental effects of the project to the Agency for review and comment. A comprehensive study report detailing the conclusions of the Agency and the federal committee on the environmental effects of the project will then be prepared. This report will be submitted to the federal Minister of the Environment (the Minister) and will also be made available for public review and comment.

The Minister will review the CSR as well as the results of public and Aboriginal consultations. If the Minister concludes that additional information or specific actions are needed to address the concerns of the public or Aboriginal groups, the Minister may require the Agency or proponent to ensure that additional information is gathered or that measures are taken to resolve those issues.

Once all the necessary information has been provided, the Minister will issue an environmental assessment decision statement. This statement sets out the Minister's opinion as to whether the project is likely to cause significant adverse environmental effects, taking into account the implementation of the mitigation measures and follow-up program that the Minister considers appropriate.

Once the Minister has issued an environmental assessment decision statement, the project is referred back to the federal authorities for their respective decisions under section 37 of the Act. The federal authorities can then take appropriate regulatory actions, such as issuing permits, licences or approvals, depending on the outcome of the environmental assessment.

1.5 Scope of the environmental assessment

Scoping establishes the boundaries of the federal environmental assessment in order to focus the assessment on the relevant issues and concerns for decision making. The scope of the environmental assessment determines: the components of the proposed project that must be included in the environmental assessment, the main environmental components likely to be affected by implementation of the project, as well as the spatial and temporal boundaries of the analysis.

³ See Appendix 3 for a list of contacts.

1.5.1 Scope of the project

For the purposes of a federal EA, the scope of the project under review includes all the components, infrastructure and related and ancillary works comprising the project submitted by the proponent. The scope also includes all other works, permanent or temporary structures or activities related to the project and associated with the construction, operation or decommissioning of the project.

Based on the information contained in the project description received from the proponent as well as the supplementary information provided in response to the Agency's requests, the project includes as a minimum the following activities and components:⁴

- the operation of an open-pit mine;
- storage areas for low-content ore, waste rock and unconsolidated deposits;
- a tailings site (2 cells) as well as a containment dike;
- water-retaining structures, retention basins, dikes;
- use of the pit for storing some of the tailings;
- an ore processing plant that includes crushing, milling, magnetic separation and flotation areas;
- a system for loading the concentrate for shipment by truck or train to a smelter;
- diversion of tributaries of the Villemontel River in the vicinity of the mine site and all other points of connection to the receiving environment;
- capture, management and treatment of run-off, process water, surface water, groundwater and dewatering water;
- administrative offices and service buildings, as well as a diesel tank farm;
- explosives manufacturing and storage;
- storage areas or garages for machinery and equipment;
- the construction and maintenance of access roads and an 8-kilometre rail spur line;
and
- site restoration.

1.5.2 Factors to be considered

The environmental assessment will include consideration of the following factors, listed in paragraphs 16(1)(a) to (e) and subsection 16(2) of the Act:

- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
- the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- the significance of the effects referred to above;

⁴ Following the alternative means analysis, the scope of the project could also include related projects not described in the project description received from the proponent, particularly in regard to ore processing and transport.

- the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future;
- the observations of the public and Aboriginal communities received during the environmental assessment;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and
- the development of a follow-up program in respect of the project and its requirements.

Environmental effects, as defined in subsection 2(1) of the Act, mean any change the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*, any effect of any of these changes on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes by Aboriginal persons, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and any change to the project that may be caused by the environment.

1.5.3 Scope of factors to be considered

The effects analysis will be based on the state of the environment in the study area prior to project implementation. The study area includes as a minimum the project components and activities listed in Section 1.5.1 and their entire area of influence, meaning the area within which the direct and indirect environmental effects of the project components will occur.

The proponent will clearly identify and justify the spatial boundaries determined for each component of the environment under study. A summary table indicating these boundaries and the rationale must be included in the EIS to facilitate the reader's understanding.

The temporal boundaries chosen for the analysis should span all phases of the project: construction, operation, temporary closure, foreseeable modifications, decommissioning and restoration of the sites affected by the project. The temporal boundaries should also consider seasonal and annual variations related to the VECs for all phases of the project, where relevant.

The proponent is encouraged to consult federal and provincial government departments and agencies, Aboriginal groups and the public, in order to confirm the spatial and temporal boundaries used in the EIS.

1.6 Presentation of the environmental impact statement

The proponent shall provide the Agency with fifteen (15) hard copies of the environmental impact statement in French and six (6) copies in English as well as the electronic versions. The supplemental information documents produced in response to the Agency's questions and comments must comply with the same submission requirements.

The proponent is also required to prepare a separate report summarizing the information contained in the EIS. In addition to submitting an English and French version of this summary report, it is strongly recommended that the proponent have the summary translated into the appropriate Aboriginal language(s) in order to facilitate consultation activities during the environmental assessment.

The summary shall include in particular:

- a concise description of all the key facets of the project;
- a succinct description of the consultations conducted with Aboriginal groups, the public and government agencies, with a summary of the issues raised and solutions found and/or suggested during these consultations;
- an overview of the main effects of the project and of the proposed mitigation measures; and
- the proponent's conclusions and important decisions resulting from the assessment.

1.7 Canadian Environmental Assessment Registry

In implementing the Act, the Government of Canada is committed to promoting public participation in the environmental assessment of projects and providing access to the information on which environmental assessments are based. In connection with this commitment, section 55 of the Act requires the responsible authority to maintain a public registry concerning every project for which an environmental assessment is carried out.

All documents prepared or submitted by the proponent or any other stakeholder in relation to the environmental assessment are included in the CEAR and made available to the public on request. Certain confidential or sensitive information that should be protected and not made public may be excluded from the CEAR. In such cases, the Agency, which is responsible for maintaining the CEAR, must be provided with arguments demonstrating a likely risk of harm.

Observations, comments and concerns expressed by the public during the comprehensive study process will be included in the CEAR and made available to the public on request. Personal information will be protected under the *Privacy Act*.

The CEAR website can be consulted at: www.ceaa.gc.ca

2 PREPARATION OF THE ENVIRONMENTAL IMPACT STATEMENT

The following sections describe the required content of the EIS.

2.1 Project background

The objective of this section of the EIS is to present the proponent, provide an overview of the project and its location, identify the participants in the environmental assessment and determine the regulatory framework and the role of the governments concerned by the environmental assessment of this project.

2.1.1 Presentation of the proponent

The EIS shall include in particular:

- the proponent's contact information;
- the identification of the legal entity that will plan, manage and operate the mine as well as the related works; and
- the identification of key personnel, contractors or subcontractors responsible for preparing the EIS.

2.1.2 Project overview

The EIS must briefly summarize the project by presenting the project components, associated and ancillary works, activities, scheduling details, the timing of each phase of the project and other key features. If the project is part of a larger sequence of projects, the proponent must outline the larger context and, if necessary, present the relevant references. The purpose of this overview is to provide the key components of the project.

2.1.3 Project location

The EIS must contain a concise description of the geographic setting in which the project will take place. The description must include the area affected not only by the project components, but also by the activities required to implement the project and any other significant environmental characteristics. The EIS must describe the regional setting of the project and present in map form at appropriate scales:

- the geographic coordinates of the project;
- a land use plan including municipal boundaries, public land, private land and land use designations;
- a regional development plan presenting the future natural resource exploitation activities, plans regarding the establishment of protected areas, major land use issues, anticipated community, economic and recreation/tourism development;
- boundaries of designated ecological areas and environmentally sensitive areas such as national, provincial and regional parks, ecological reserves, protected areas and other sensitive areas; and
- a description of the local and Aboriginal communities potentially affected by the project.

2.1.4 Environmental assessment participants

The EIS should clearly identify the main environmental assessment participants, including government authorities, Aboriginal groups, community groups, environmental organizations, etc.

2.1.5 Regulatory framework and the role of government

This section should identify the government bodies involved in the environmental assessment. More specifically, it must provide:

- environmental and other specific regulatory approvals and legislation that are applicable to the project at the federal, provincial, regional and municipal levels;
- government policies, resource management, and planning or study initiatives relevant to the project and/or EA, and a discussion of their implications;
- any treaty, claim or agreement between governments and Aboriginal groups relevant to the project and/or EA;
- any relevant land use plans, land zoning, or community plans.

2.2 Project description

2.2.1 Purpose of and need for the project

The “purpose of” and “need for” the project must be established from the perspective of the proponent. The proponent shall establish the fundamental rationale for the project, explaining the background, the problems or opportunities that project is intended to satisfy and the stated objectives. If the project objectives are related or contribute to public- or private-sector policies, plans or programs (regional transportation plans, land use plans, etc.), this information should also be included.⁵

2.2.2 Project components, activities and schedule

The proponent must provide a detailed description of the planned work and activities for all phases of the project including construction, operation, temporary closure, foreseeable modifications, decommissioning, restoration of the sites and follow-up activities. The proponent must also describe in detail the project components, infrastructure and associated and ancillary works of the project. The description must include an implementation timetable for all the activities planned during each phase of the project, as well as any other project-related activities. If the project is part of a larger sequence of projects, the proponent must describe the broader context and, if necessary, present the relevant references. This includes detailed descriptions of the planned activities, the location and magnitude of each activity, as well as the expected outcomes.

⁵ For more information, see the Operational Policy Statement entitled *Addressing “Need for”, “Purpose of”, “Alternatives to” and “Alternative Means” under the Canadian Environmental Assessment Act*, available on the Agency website (www.ceaa-acee.gc.ca/default.asp?lang=En&n=5C072E13-1).

The project description must be sufficiently detailed to ensure a proper understanding of the potential issues and effects. The geographic coordinates of the project site must be provided.

The EIS must include, but is not limited to, a description of:

- the activities that will impact the aquatic and riparian environment, including those affecting intermittent streams, flood risk areas and wetlands (peatlands, marshes and swamps);
- the dikes, specifying their location, size and construction materials used;
- the storage areas for waste rock, ore, overburden and tailings, specifying the locations, deposition and containment methods, dimensions and any water bodies affected, if applicable;
- the permanent and temporary access infrastructure, specifying the route for each of the road and railway accesses as well as the location, type of structures used for the crossing (e.g. bridge, culvert) and the characteristics of the physical works at each river or stream crossing. For bridges, the characteristics include in particular the type, the clear span and the number of pillars, while for culverts, the characteristics include the type (arch or closed-bottom), the shape (round, square, arched, etc.), the material (steel, concrete, plastic, etc.), the dimensions (diameter, length, width and height), the slope, and whether or not there are weirs;
- any other components required by the project and relevant to the analysis of the project, such as: landing strip, wharf or berthing area for barges or boats, etc.;
- a map of the site: at an appropriate scale, showing the topography and all the physical components of the project (pit, accumulation areas for waste rock, ore and overburden, tailings site, dikes, polishing pond, process water pond, main road, secondary roads, effluent discharge points, water intakes, fuel depot, main buildings, etc.) and that can be used to determine their dimensions;
- the project's surface water and groundwater supply requirements, as well as discharge and intake volumes (including dewatering water). The water discharge and intake infrastructures must be located on a plan or map to scale. The EIS must describe in particular:
 - all the other water intakes, indicating their location, dimensions, depth at which the water will be removed, quantity of monthly and annual removals, dimensions of the structures that will keep the water intakes in place and their area of encroachment below the natural high water mark;
 - the volumes of water required for operations (mining, ore processing, fire control, drinking and sanitary water, etc.);
 - wastewater and domestic water treatment ponds and units;
 - the effluent discharge points, alterations to the receiving environment at the effluent discharge point (riprap, diking, etc.) and an estimate of the projected average monthly and annual effluent volumes;
 - the collector and/or diversion ditches and canals;
 - an estimate of the volume of groundwater that will be pumped daily for dewatering of the pit and indicate whether it will be necessary to lower the water table in the vicinity of the pit and, if applicable, describe the methods that will be used to achieve this.

Although the proponent is expected to provide an exhaustive list of project activities, including the planned activities in the bed of each watercourse and water body affected by the project, the emphasis must be placed on the activities most likely to have environmental effects. Sufficient information should be included to predict environmental effects and address public concerns. The EIS should highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment. It should also include a detailed schedule describing the time of year, frequency and duration of all activities.

The proponent shall provide the following information concerning explosives manufacturing and storage:

- description of explosives production:
 - indicate the explosives manufacturing steps that will be carried out on or near the site;
 - indicate whether an existing licence for an explosives factory will be used for this project and provide details if necessary; and
 - indicate whether a temporary explosives factory will be used for this project and provide details if necessary.
- description of explosives storage:
 - indicate whether magazines for storing explosives will be required on or near the site; describe the building footprint, type of building, site access, ancillary works, etc.

NRCAN also requires the following information in order to complete the environmental assessment of an explosives factory/magazine:⁶

- explosives to be manufactured;
- maximum quantity of explosives at each facility;
- a detailed site plan with distances to vulnerable features such as dwellings, roads, camps, railways, bodies of water, etc. Infrastructures for manufacturing or storing explosives should be identified and include: explosives and detonator magazines, fuel storage, ammonium nitrate storage, maintenance/wash area, process vehicles and their parking area, any offices, warehouses, buildings, etc. The proponent needs to demonstrate that safety distances required by the Explosives Regulatory Division (ERD) of NRCAN have been considered and met;
- fuel and ammonium nitrate storage plans; storage of ammonium nitrate is to be in conformance with ERD guidelines;
- liquid effluent disposal plans;
- evaluation of worst case scenario (i.e. accidental explosion);
- spill contingency plans; and
- details on any temporary explosive facilities to be used for starting the project (same as above).

⁶ The NRCAN website provides additional information about licences (www.rncan.gc.ca/minerals-metals/explosives/4035).

2.2.3 Project alternatives and alternative means of carrying out the project

2.2.3.1 Project alternatives

The proponent must present project alternatives. Project alternatives are functionally different ways to meet the project's need and achieve the project's purpose. The EIS must discuss the advantages and disadvantages of each alternative, from an environmental, technical and economic perspective. The proponent is also encouraged to show how the project alternatives are developed from a sustainable development perspective and to indicate whether they may have any potential adverse effects on potential or established Aboriginal or treaty rights.

2.2.3.2 Alternative means analysis

The EIS must present an analysis of alternative means of carrying out the project that are technically and economically feasible for the implementation of the various project components.

The level of detail for the analyses underlying the choice of alternative means of carrying out the project must be sufficient to allow the Agency, technical and regulatory bodies, the public and Aboriginal groups to assess their respective advantages from an environmental, technical and economic perspective. The alternative means analysis, supported by photographs illustrating each of the sites and their surrounding area, will have to take into account the physical and biological considerations of the environment, technical constraints and the significance of the effects associated with the alternatives chosen.

The preferred alternative means will be chosen using the comparative analysis of the environmental effects and their technical and economic feasibility. In its alternative means analysis, the proponent must, as a minimum, address the project components outlined in the following paragraphs.

Alternative means analysis – concentrate sites and transport

The proponent will describe the various sites considered for the location of the infrastructure components required to operate the mine, including in particular for the establishment of the ore processing plant, the preparation of waste rock and tailings accumulation areas, and the installation of the water treatment systems. The proponent will present the reasoning and the criteria used to determine the choice of sites, and specify how the criteria were considered.

The proponent shall also present and analyze the environmental effects of the possible alternatives for ore concentrate transport and transshipment as well as the final destination of the ore concentrate.

Alternative means analysis – Ore processing methods

The proponent must present the various ore processing methods considered, specifying the advantages and disadvantages of each from a technical, economic, social and environmental perspective. The criteria considered by the proponent in determining the choice of ore extraction and processing methods and technologies must also be detailed. The proponent will specify how the environmental criteria were considered (e.g. liquid discharge criteria, atmospheric emission standards, management of mine tailings, etc.).

Alternative means analysis – Mine waste disposal

The EIS will include an assessment of the project alternatives for disposing of mine waste.

The proponent has identified the potential need to use water bodies frequented by fish for the disposal of mine waste, including tailings and waste rock, as well as for the management and treatment of wastewater. Before water bodies frequented by fish can be used for disposal of mine waste, they must be designated as tailings impoundment areas in Schedule 2 of the MMER.

The regulatory process provided for by the MMER will be initiated when the proponent has completed a detailed assessment of alternatives for mine waste disposal. The proponent should therefore conduct an assessment of the alternatives for mine waste disposal as a component of the EIS in order to streamline the regulatory review process, reduce the time required and facilitate a thorough, transparent review of the assessment of alternatives.

The proponent must demonstrate that the storage of tailings or other related waste in natural water bodies is the most environmentally, technically and socio-economically sensible solution when all factors are taken into account, including long-term risks.

The mine waste alternatives assessment should objectively consider all available options for mine waste disposal, including at least one that will not have an impact on water bodies frequented by fish. This assessment should qualitatively and quantitatively assess the environmental, technical, economic and socioeconomic aspects of each alternative for the life cycle of the mine, including the post-closure phase. The mine waste alternatives assessment should include all the aspects that could contribute to the predicted impacts of the proposed project. The economic component of this assessment should consider the full costs of each alternative throughout the mine life cycle from construction through post-closure, including long-term maintenance and monitoring requirements, as well as costs associated with the legislated requirement for a compensation plan to offset fish habitat loss.

The proponent is required to utilize the methodology provided by Environment Canada to conduct a robust and thorough assessment of alternatives for mine waste disposal.⁷

⁷ For more details, the proponent should consult the *Guidelines for the Assessment of Alternatives for Mine Waste Disposal*, available on the Environment Canada website (www.ec.gc.ca/pollution/default.asp?lang=En&n=C6A98427-1).

2.2.4 Restoration

The EIS shall provide an overview of the decommissioning and restoration plan for all components associated with the project. The plan will be used to provide guidance on the specific measures and activities to be implemented in order to reduce the risks of long-term environmental degradation during the decommissioning or closing of facilities.

2.3 Description of the existing environment

2.3.1 Methodology

The EIS will provide a baseline description of the environmental components, their interrelations and interactions as well as their variability over time scales appropriate to this EIS. The description should be sufficiently detailed to characterize the environment before any disturbance to the environment due to the project and to identify, assess and determine the significance of the potential adverse environmental effects of the project.

For the description of the human environment, the proponent must ensure that enough information is provided to allow for assessment of the impacts of the project on people and communities in the study area.

For the biological environment, baseline data in the form of surveys alone are not sufficient to assess effects. The proponent shall consider the resilience of relevant species populations/communities and their habitats. The proponent shall summarize all pertinent historical information on the size and geographic extent of relevant animal populations as well as density, based on best available information. When little or no information is available, specific studies must be designed in order to collect more information on the populations and densities of the species.

The habitat at the regional and local scale must be indicated on an ecological map of the types and species of aquatic and terrestrial vegetation. Habitat uses must be characterized by type of use (e.g. breeding, migration, feeding, overwintering), frequency and duration. This assessment must cover all the relevant seasonal variations as well as range and probability of natural variations over time. The proponent must address issues such as habitat, nutrient and chemical cycles, food chains and productivity, where necessary to understand the effect of the project on ecosystem health and integrity.

The EIS will describe the sampling methods used for data collection in order to ensure that they are correctly understood and interpreted. If the data have been extrapolated or otherwise modified to depict environmental conditions, the modelling methods shall be described.

The proponent must ensure that the EIS considers, without limitation, the main components of the environment described in the following sections.

2.3.2 Physical environment

The proponent shall describe, without limitation, the following components of the physical environment in the study area:

- hydrology, hydrogeology and water quality, including:
 - hydrological interactions between surface water and groundwater;
 - physicochemical quality of groundwater, identification of aquifer formations, their vulnerability and extent, direction of flow;
 - description of groundwater sources used as drinking water in the study area, their current use and potential for future use;
- geology, geomorphology and geohazards (e.g. seismic activity, landslides);
- weather conditions, climate and climate change;⁸
- acoustic environment (including the characterization of baseline noise levels and the identification of sources and types of noise and sensitive receptors);
- air quality:
 - characterization of ambient air quality in the study area;
 - description of the model used to estimate the project's contribution to the atmospheric dispersion of contaminants on the mining site and in the surrounding area (modelling scenarios, entries for the dispersion model adopted in the EIS, assumptions, meteorological data, characteristics of the sources of atmospheric emissions, dust and other contaminants, all the sensitive receptors, etc.);
 - greenhouse gases (identification of the sources of GHG emissions for the entire mine life cycle, estimation of the anticipated quantities of GHGs and proposed mitigation measures to reduce emissions originating from the project. The proponent must estimate the contribution of the project's emissions at the local, provincial and federal scale, and then determine the GHG emission category of the project (low-, medium- or high-emission project);
- characteristics of the geochemical behaviour of waste rock, ore, tailings, overburden and potential construction materials, including:
 - potential for acid generation, neutralization and contaminated neutral drainage;
 - assessment of metal leaching properties.

2.3.3 Biological environment

⁸ The document entitled *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* can be consulted on the Agency website (www.ceaa-acee.gc.ca/default.asp?lang=En&n=DACB19EE-1).

2.3.3.1 Fish and fish habitat⁹

In order to permit analysis of the project's effects pursuant to the *Fisheries Act*, the EIS must document the physical and biological characteristics of the fish habitat likely to be directly or indirectly affected by the project.

Note that certain intermittent streams or wetlands may constitute fish habitat or contribute indirectly to fish habitat. The absence of fish at the time of the survey does not irrefutably indicate an absence of fish habitat.

Physical characteristics

The EIS must illustrate, on a topographic scale map, the hydrographic network (water bodies and watercourses) including intermittent streams, flood risk areas and wetlands. It must also indicate the boundaries of the watershed and subwatersheds of the study area.

The emphasis must be placed on the watercourses and water bodies likely to be affected by the project, their physical characteristics, physico-chemical quality and hydraulic regime.

Hence, for all the watercourses and water bodies on which effects are anticipated, the EIS must describe the biophysical characteristics, including:

- For each watercourse, indicate the name of the watercourse and provide a description of the habitat by homogeneous section. The parameters which must be determined are length of the section, width of the channel from the high water mark, depth, current velocity, type of substrate, aquatic and riparian vegetation as well as natural or manmade obstacles, whether permanent, temporary or partial, to the free passage of fish. It is recommended that photos be attached to the description;
- For each lake or water body affected, indicate the name of the water body and provide a description. The parameters that must be determined are total area, bathymetry, maximum and mean depths, water level, type of substrate, surface area and location of the submerged and emergent aquatic vegetation, and water quality parameters (e.g. water temperature, turbidity, pH, dissolved oxygen profiles);
- Monthly/seasonal/annual volume data and outflow data;
- Seasonal flows and annual hydrography (maximum and minimum flows);
- Natural obstacles or existing structures that hinder the free passage of fish.

⁹ For more information, the following reference documents can be consulted on the Fisheries and Oceans Canada Web site: *Proponent's Guide to Information Requirements for Review under the Fish Habitat Protection Provisions of the Fisheries Act*, 2009

(<http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/requirements-exigences/index-eng.pdf>); *Quebec Operational Statement, Version 1.0, Temporary Stream Crossing*, 2009 (www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/qc/crossings-eng.asp); *Operational Statement, Version 3.0, Ice Bridges and Snow Fills*, 2007 (www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/qc/ice-eng.asp); *Quebec Operational Statement, Version 3.0, Bridge Maintenance*, 2007 (www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/qc/bridge-eng.asp). The document entitled *Bonnes pratiques pour la conception et l'installation de ponceaux de moins de 25 mètres* (2010) can be obtained from DFO.

Biological characteristics

For all the fish species present in the study area, the EIS must describe the components of their habitats likely to be affected by implementation of the project.

A fish sampling campaign must be carried out. The survey methods used must be described in order to allow DFO to ensure the quality of the information provided. If sectoral studies on fish and fish habitat were carried out previously, these studies must be submitted to DFO.

Hence, for all watercourses or water bodies on which the project is likely to have effects, the EIS must:

- describe the fish species present on the basis of the surveys carried out and the data available (e.g. electric and experimental fishing, government and historical databases, sport fishing data, etc.); identify the sources of the data and provide the information concerning the fishing carried out (e.g. location of the sampling stations, catch methods, date of catches, species);
- specify the location and surface area of the potential or confirmed fish habitats and describe how they are used by fish (spawning, rearing, growth, feeding, migration, overwintering);
- describe the habitat components and functions likely to be affected by implementation of the project;
- locate and describe the suitable habitats for species at risk on federal and provincial lists found or likely to be found in the study area.

2.3.3.2 Wildlife species (other than fish) and their habitats

The EIS must present, without limitation, the following information concerning wildlife species and their habitats:

- A description of the species present (mammals and amphibians) and the functions of their habitat, based on the surveys carried out and available data, in terms of abundance, distribution and diversity, as well as habitat use, including a detailed description of the methodology (survey description, timing, etc.) for each of these species;
- A description of all protected and conservation areas established by federal, provincial and municipal jurisdictions (e.g. ecological reserves, parks, sites of historical or ecological importance, nature reserves, federal migratory bird sanctuaries and national wildlife areas);
- A description of the bird fauna likely to be present in the study area for all four seasons (spring migration, breeding season, fall migration, winter).¹⁰ The

¹⁰ For more information, the following reference documents can be consulted on the Environment Canada Web site (www.ec.gc.ca/publications): *Migratory Birds Environmental Assessment Guideline*, *Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada*, *Guide for Impact Assessment on Birds* and

description will be based on existing data or on recent surveys carried out in the study area according to recognized methods. The description will make it possible to:

- identify all the species likely to be present in the study area, particularly species for which breeding is confirmed in the study area, as well as the species at risk or priority species;
- identify the location and extent of the various types of bird habitat;
- identify areas of concentration of migratory birds, such as breeding areas, colonies, spring and fall migration staging areas, wintering areas, and the breeding and nesting areas of birds of prey;
- assess the abundance, distribution and density for each bird species and by the various types of habitat;
- present the various data sources used and the survey methods used, the raw data as well as the analysis results used to predict the impacts on birds.

It should be noted that many activities carried out during the breeding season may inadvertently cause the destruction of nests and eggs of migratory birds. This “incidental take” of nests and eggs contravenes the *Migratory Birds Regulations*. According to paragraph 6(a) of these Regulations, no person shall disturb, destroy or take a nest or egg of a migratory bird.¹¹

2.3.3.3 Vegetation

The EIS shall characterize the baseline vegetative communities within the area potentially affected by the project. In particular, the EIS will include information (distribution, extent and functions) on the following key communities, species groups or ecosystems that have intrinsic ecological or social value:

- forests;
- riparian ecosystems;
- plant species and ecological communities of conservation concern; and
- wetland ecosystems.

If the project involves activities that interfere with the ecological or socio-economic functions of wetlands, the proponent shall:

- describe the wetland or wetlands present in the study area using a recognized methodology that encompasses soil characteristics, hydrology and vegetation;
- determine the functions (e.g. hydrological, biogeochemical, ecological, socio-economic) of each wetland;

Environmental Assessment Guideline for Forest Habitat of Migratory Birds.

¹¹ For more information, see the Environment Canada Web site (www.ec.gc.ca/paom-itmb).

- determine the local, regional or even national importance of each wetland.¹²

2.3.3.4 Species at risk

The EIS shall describe and identify any biological species of conservation status and their habitat, i.e. species listed in Schedule 1 of the federal *Species at Risk Act*, species with a status designation proposed by the Committee on the Status of Endangered Wildlife in Canada and species listed in the *Quebec Act respecting threatened or vulnerable species*.

The EIS will summarize the methods and results of wildlife surveys conducted over the course of the seasons and at various times of day which facilitate detection of the target species or species groups. This includes information pertaining to species of conservation concern that may occur at any point throughout the year in the project area, including their conservation status, relative abundance, distribution and habitat use.

The website of the Species at Risk Public Registry can be consulted at: www.sararegistry.gc.ca

2.3.4 Human environment

In the study area, the EIS must, without limitation:

- indicate current land use for hunting, recreational fishing, wilderness lodges or cottages as well as any recreational/tourism facilities or infrastructure;
- identify the land access routes into the area (snowmobile trails, forest roads, etc.) in the vicinity of the mining project;
- complete an inventory of all agricultural, forestry, industrial and commercial activities; and
- document private and industrial use of groundwater.

The EIS will identify and locate the terrestrial and aquatic areas, sites and infrastructure components of historical, archeological, paleontological, architectural or cultural value. A description of the value attached to these sites must be provided.

The EIS must also provide a description of the land and resource use by the Aboriginal communities within the study area. To this extent, the EIS shall include, without limitation, a description of:

- the locations, resources and species of social, economic, heritage or cultural value for the Aboriginal communities; and
- the activities undertaken on the territory (camps, travel, hunting, fishing, trapping,

¹² For more information, the following reference documents can be consulted on the Environment Canada Web site (www.ec.gc.ca/publications): *Federal Policy on Wetland Conservation* and *Wetland Ecological Functions Assessment: An Overview of Approaches*.

harvesting, etc.).

2.4 Environmental effects assessment

2.4.1 Assessment methodology

This section will describe the potential effects of the project on the environment (as defined in the Act). Potential effects of all components of the project must be documented. The proponent must indicate the project's effects during construction, operation, maintenance, foreseeable modifications, and where relevant, closure, decommissioning and restoration of sites and facilities associated with the project, and describe these effects using appropriate criteria. To the extent possible, this documentation should include, for each potential project-related environmental effect, an indication of the nature of the effect, mechanism, magnitude, direction, duration, frequency and timing, geographic extent and the degree to which it may be reversible. The proponent must consider the direct and indirect, reversible and irreversible, short- and long-term cumulative environmental effects of the project. In predicting and assessing the project's effects, the proponent must indicate important details and clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact.

In undertaking the environmental effects assessment, the proponent shall use the best available information and methods. The adverse effects on environmental components identified during the environmental assessment shall be documented and considered. All conclusions on the project's effects must be justified. The proponent must present the assessment method selected as well as the associated uncertainty or bias. The methods used must be objective and reproducible and must be sufficiently clear and concrete so that the public can easily understand the reasoning followed in determining the effects.

The assessment of the project's effects on wildlife must document the impacts on wildlife as well as quantify the harmful alteration, disruption or destruction of wildlife habitats. The quantification of wildlife habitats that may be affected by the project, by type and duration, will also consider habitat suitability and functions (breeding, feeding, migration, etc.).

It is also important that the assessment methodology include the consideration of views from the public and Aboriginal groups, including any perceived changes attributed to the project.

2.4.2 Valued ecosystem components

Based on the description of the environment, the environmental components that will be affected by one or more project activities must be identified. Of these components, special attention must be paid to the VECs. The proponent shall describe how the VECs were selected and what methods were used to predict and assess the adverse environmental effects of the project on these components. The value of a component may be assigned by

its role in the ecosystem and its sensitivity, but also by the scientific, legislative or popular importance attached to it.

VECs should be described in sufficient detail to allow the reader to understand their importance and assess the potential for environmental effects arising from the project activities. The boundaries for each VEC may differ. The proponent will clearly identify and justify the spatial delimitation chosen for each environmental component studied. This list of VECs in the EIS shall be modified as appropriate by the proponent, following consultations with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders.

2.4.3 Public comments received as part of consultation on the Environmental Impact Statement Guidelines

The Agency received comments from the public as part of its consultation on the EIS Guidelines for the environmental assessment of the project. This consultation revealed that:

- the proponent must specifically assess the direct and indirect effects of the project on the St-Mathieu-Berry Esker. The ground water found in this esker is the drinking water supply for the town of Amos;
- the proponent must specifically assess the direct and indirect effects of the ground and surface hydrological changes on the eskers, water bodies and wetlands; and
- the proponent must specifically assess the direct and indirect effects of the project on the quality, availability and harvesting of berries.

2.4.4 Mitigation measures

The Act defines “mitigation” as the elimination, reduction or control of the adverse environmental effects of a project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. Every comprehensive study conducted under the Act must take into account measures that would mitigate any significant adverse environmental effects of the project.

The EIS must specify the actions, works, best available technology, corrective measures or additions planned during the project’s various phases to eliminate or reduce the significance of adverse effects. The EIS must also present an assessment of the effectiveness of the proposed mitigation measures. The reasons for determining whether the mitigation measure reduces the significance of an adverse effect must be made explicit.

Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective should be clearly and concisely described.

When it is determined that a work or an activity will have adverse effects on fish habitat, the proponent must, after having considered and documented the possibility of relocating or

modifying the project, plan mitigation measures in an effort to reduce the project's effects on fish habitat (see Appendix 4). In accordance with the principle of no net loss, set out in DFO's Policy for the Management of Fish Habitat, unavoidable and authorized HADD of fish habitat must be compensated. It should be noted that if the proponent is unable to comply with the *Guidelines for the use of explosives in or near Canadian fisheries water*,¹³ the proponent will also have to submit an application for authorization under section 32 of the *Fisheries Act*.

2.4.5 Residual effects

The EIS should present and describe any residual effects of the project on the biophysical and human environments after the mitigation measures have been taken into account.

The EIS must include a summary of the project's residual effects so that the reader can clearly understand the real consequences of the project and the extent to which the effects can be mitigated or compensated.

The EIS must identify the criteria used to assign significance ratings to any predicted adverse effects as well as a detailed analysis of the significance of the potential residual adverse environmental effects. The EIS must contain clear and sufficient information to enable the Agency, technical and regulatory agencies, Aboriginal groups and the public to properly understand the proponent's judgment of the significance of effects. The following elements may be used in determining the significance of residual effects:

- the nature or impact of the effect (positive, negative, direct or indirect);
- geographic extent;
- magnitude;
- timing, duration and frequency;
- permanence of the effect; and
- reversibility.

In assessing the significance against these criteria, the EIS shall, where possible, employ relevant existing regulatory documents, environmental standards or guidelines, such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment. The EIS must include a section explaining the assumptions, definitions and limitations of the above-mentioned criteria.

If significant adverse effects are identified, the proponent shall determine the probability that they will occur. The proponent shall also address the degree of scientific uncertainty associated with the data and methods used within the framework of its environmental analysis.

¹³ Available on the DFO Web site at: publications.gc.ca/collections/Collection/Fs97-6-2107E.pdf

2.4.6 Effects of the environment on the project

Environmental hazards that may affect the project will be described, and their predicted effects and how they were considered in the design of the project will be documented. The proponent will address the following factors:

- geohazards;
- extreme climatic conditions;
- forest fires; and
- presence of sources of contamination in the area of influence of the work.

2.4.7 Malfunctions and accidents

The probability of possible malfunctions or accidents during construction, operation, modification or any other undertaking in relation to the project, and the potential significant adverse environmental effects of such events, will be identified and described in the environmental assessment. The description will include, without limitation, the following:

- accidental spills of hazardous materials (chemicals, petroleum products or tailings);
- risk of fire and explosion at the site; and
- contingency plans and measures for responding to emergencies.

2.4.8 Cumulative environmental effects

The proponent shall identify and assess the cumulative environmental effects of the project in combination with other past, present or reasonably foreseeable activities and/or projects within the study areas. Cumulative effects may result if the implementation of the project under study should cause direct residual adverse effects on the environmental components, taking into account the application of mitigation measures and/or if the same environmental components are affected by other past, present or reasonably foreseeable future activities or projects.

This section should include a definition of and justification for the VECs chosen as well as the spatial and temporal boundaries of the cumulative effects assessment. It should be noted that these boundaries may vary depending on the components selected for cumulative effects assessment. The proponent should also propose and justify the choice of projects and activities selected for the cumulative effects assessment. The approach and methods used to identify and assess the cumulative effects should be explained.¹⁴

The EIS shall identify measures that will mitigate any significant adverse cumulative environmental effects and provide an assessment of the effectiveness of these measures. In cases where measures exist that are beyond the scope of the proponent's responsibility, the

¹⁴ The Agency's Operational Policy Statement entitled *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act* as well as the document entitled *Cumulative Effects Assessment Practitioners Guide* can be consulted on the Agency website (www.ceaa.gc.ca/default.asp?lang=En&n=DACB19EE-1).

proponent shall identify these effects and the parties that have the authority to act. In such cases, the proponent shall summarize the discussions that took place with the other parties in order to implement the necessary measures.

2.5 Capacity of renewable resources

The environmental assessment shall consider the capacity of the renewable resources likely to be significantly affected by the project. The proponent shall identify those resources likely to be significantly affected by the project and describe how the project could affect their sustainable use, and shall also describe the criteria used to determine whether their sustainable use will be compromised.

2.6 Public and Aboriginal Consultation¹⁵

Public and Aboriginal participation is a crucial component of the federal environmental assessment process. When the public has the opportunity to participate fully in the process, the quality and credibility of the environmental assessment is enhanced.

2.6.1 Public consultation

The Act requires that the Agency provide three formal opportunities for public participation in order to collect public opinions, comments and concerns:

- First consultation – the project and the conduct of the comprehensive study. At this stage, a federal guidelines document intended to provide guidance to the proponent in preparing the environmental impact statement is submitted for public consultation. After receiving comments from the public, the Agency amended these EIS guidelines to take the comments received into account (see Section 2.4.3).
- Second consultation – the results of the environmental assessment of the project. During this stage, it is essential that the proponent be present. The proponent must contribute by preparing appropriate materials (executive summaries, visual aids, maps, tables, etc.) to facilitate consultation.
- Third consultation – the comprehensive study report. This stage takes place after the environmental assessment of the project has been completed and the Agency has

¹⁵ This section essentially concerns the consultations conducted in the context of the environmental assessment. The federal authorities may have to conduct other consultations in the context of their regulatory processes. For example, if the project involves a regulatory amendment in order to designate water bodies for the storage of tailings, as provided for in Schedule 2 of the MMER, Environment Canada will have to hold public consultations concerning this proposed amendment.

presented its analysis in the comprehensive study report to the Minister of the Environment.

In addition to the consultations conducted by the Agency, the proponent must describe the consultations under way and proposed and the information sessions on the project. The proponent must provide a summary of the discussions, the venue, the individuals and organizations consulted, the concerns expressed, the extent to which this information was incorporated in the project design as well as in the EIS, and any resulting changes. In addition, the proponent must describe any outstanding issues and how they will be addressed.

2.6.2 Aboriginal consultation

Public and Aboriginal participation is a crucial component of the federal environmental assessment process. When the public has the opportunity to participate fully in the process, the quality and credibility of the environmental assessment is enhanced.

Public consultation

The Act requires that the Agency provide three formal opportunities for public participation in order to collect public opinions, comments and concerns:

- First consultation – the project and the conduct of the comprehensive study. At this stage, a federal guidelines document intended to provide guidance to the proponent in preparing the environmental impact statement is submitted for public consultation. Following the public consultation, the Agency may, if necessary, amend these guidelines to take the comments received into account.
- Second consultation – the results of the environmental assessment of the project. During this stage, it is essential that the proponent be present. The proponent in particular must contribute by preparing appropriate materials (executive summaries, visual aids, maps, tables, etc.) to facilitate consultation.
- Third consultation – the comprehensive study report. This stage takes place after the environmental assessment of the project has been completed and the Agency has presented its analysis in the comprehensive study report to the Minister of the Environment.

In addition to the consultations conducted by the Agency, the proponent must describe the consultations under way and proposed and the information sessions on the project. The proponent must provide a summary of the discussions, the venue, the individuals and organizations consulted, the concerns expressed, the extent to which this information was incorporated in the project design as well as in the EIS, and any resulting changes. This description has to allow to understand the answer of the proponent to each of them enter

and the changes which result from it.

Aboriginal consultation

When the Crown contemplates conduct that may have potential adverse impacts on established or potential Aboriginal or treaty rights, it has a legal duty to consult with Aboriginal groups before making a decision to proceed with the proposed conduct. In addition, pursuant to the Act, the federal environmental assessment must assess the project's potential environmental effects on the current use of lands and resources for traditional purposes by Aboriginal communities. In addition, under the Act, one of the objectives of an environmental impact assessment is the participation of Aboriginal groups that may be affected by the project.

As a result, the proponent must consult with and involve Aboriginal communities likely to be affected by the project. The proponent must make a real effort to come to an agreement on a mutually acceptable consultation process with them. In addition, the Aboriginal persons involved must have access to all relevant information that allows them understand the proposed project and to determine its impacts on their rights and interests. The proponent must make reasonable efforts to integrate “traditional Aboriginal knowledge” that will contribute to the assessment of environmental impacts. The guiding principles of the environmental assessment, described in Appendix 1 of these guidelines, provide further details on the requirements with respect to consultation.

To that end, the EIS shall contain:

- a summary of the proponent’s analysis regarding its selection of communities to consult;
- a list of potential impacts on each of the communities that may be affected by the project;
- a description of the project’s effects on traditional land use and occupation;
- a detailed map overlaying the project infrastructures and impact zones on the areas of land and resource use. The purpose of the map is to support the collection of data from Aboriginal traditional knowledge during consultation activities;
- a description of the information and consultation activities conducted by the proponent with the Aboriginal communities concerned;
- the concerns expressed in the communities and the extent to which these concerns were incorporated in the project design and EIS. This description must make it possible to understand the proponent’s response to each concern.

The description of the consultation activities conducted by the proponent with Aboriginal communities must include a summary of the discussions and of the issues and concerns raised, and describe any asserted or established Aboriginal or treaty rights potentially affected by the project. The government will take this information into account in its environmental assessment responsibilities and in the application of regulations.

If the proponent is unable to obtain all the information required to assess the project’s impacts on the traditional use of the land by Aboriginals or on Aboriginal rights, the

proponent shall describe in the EIS the efforts undertaken to obtain this information.

2.7 Benefits

Information on the predicted economic and social benefits of the project should be presented. This information will be reviewed during the assessment of the justifiability of any significant adverse environmental effect, if necessary.

The proponent is also encouraged to describe how the environmental assessment process has helped to enhance the project. Factors to be considered include:

- increased environmental benefits created as a result of the project going through the environmental assessment process;
- contribution of the EA to supporting sustainable development: describe how the EA process for the project contributed to the concept of sustainable development for a healthy environment and economy;
- public participation: describe how public participation in the EA influenced the project design and the environmental effects analysis;
- technological innovations: describe any new technology developed to address environmental impacts that could be used for other projects;
- scientific knowledge: describe any new scientific information collected through the EA that could be useful for other projects;
- social and community benefits: describe any changes in project design that resulted in indirect benefits to communities and/or social benefits.

2.8 Monitoring and Follow-up Programs

The purpose of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of the project, and to provide action plans and emergency response procedures to protect human and environmental health and safety. In the EIS, the proponent shall describe the monitoring activities at all stages of the project, the proponent's commitment to implementing these activities and the resources provided for this purpose.

A follow-up program is designed to verify the accuracy of the EA and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project. The EIS must describe the proposed follow-up program plan in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), and to confirm both the EIS assumptions and the effectiveness of mitigation measures

The follow-up program must include:

- the objectives of the follow-up and the list of components requiring environmental follow-up;

- a schedule indicating the frequency and duration of the effects monitoring mechanism;
- a description of the proposed follow-up methods and the list of parameters to be measured;
- the planned actions in the event of unanticipated environmental degradation; and
- the method for informing the population concerned of the follow-up results.

2.9 Conclusion

This section of the report shall summarize the overall findings with emphasis on the main environmental issues identified. It shall include (ideally in table format) a summary of the proponent's key commitments to implementing mitigation measures, contingency plans, monitoring and taking corrective actions, as well as site restoration and the measures intended to offset unavoidable project effects as well as the timetable for the implementation of these measures.

APPENDICES

Appendix 1: Guiding principles of environmental assessment

Environmental assessment as a planning tool

Environmental assessment is a planning tool that is used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate the possible adverse effects of development on the environment and to encourage decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and healthy economy.

Consequently, the EA of this project must, in a manner consistent with the above-mentioned needs, identify the project's possible environmental effects, propose measures to mitigate adverse effects and predict whether significant adverse environmental effects are likely after technically and economically feasible mitigation measures are implemented. The preparation and review of the EIS, as components of the EA process, are essential to the attainment of this objective.

Public participation

One of the purposes of the Act is to ensure opportunities for timely and meaningful public participation throughout the EA process. The Act ensures that, throughout the comprehensive study process, the public will have the opportunity to comment on the project and the conduct of the comprehensive study and the comprehensive study report and, in addition to the planned public consultations, to take part in the comprehensive study. The Minister of the Environment shall take into account public input when issuing the environmental assessment decision statement.

Meaningful involvement in the EA takes place when all parties involved have a clear understanding of the proposed project as early as possible in the review process. The proponent is required to provide current information about the project to the public and especially to the communities likely to be most affected by the project.

Aboriginal consultation

Pursuant to the Act, one of the objectives of the EA is to involve potentially affected Aboriginal peoples so that the EA can identify any changes that the project may cause in the environment as well as the effects of any such changes on the current use of lands and resources for traditional purposes by Aboriginal persons. The proponent shall ensure that it engages with Aboriginal peoples that may be affected by the project and that have established or potential Aboriginal or treaty rights. In preparing the EIS, the proponent must ensure that Aboriginal peoples have access to the information that they require in respect of the project and how the project may impact them. The proponent is required to provide up-to-date information describing the project to the relevant Aboriginal groups and, especially, to the communities likely to be most affected by the project. The proponent shall also involve Aboriginal groups in determining how best to deliver that information (e.g. the types of information required, formats and the number of community meetings required).

Traditional and local knowledge

Section 16.1 of the Act states that “community knowledge and aboriginal traditional knowledge may be considered in conducting an environmental assessment” and the definition of environmental effect in the Act includes the current use of lands and resources for traditional purposes by Aboriginal persons.

Traditional and local knowledge represents a significant contribution to environmental assessment. Traditional and local knowledge refers to a broad base of knowledge held by individuals and collectively by communities that may be based on spiritual teachings, personal observation and experience or passed on from one generation to another through oral and/or written traditions. Traditional and local knowledge, in combination with other information sources, is valuable in achieving a better understanding of the potential effects of projects. Traditional and local knowledge may, for example, contribute to the description of the existing physical, biological and human environments, natural cycles, resource distribution and abundance, short- and long-term trends, and the use of lands, and land and water resources. It may also contribute to project siting and design, identification of issues, the assessment of potential effects and their significance, the assessment of the effectiveness of proposed mitigation or compensation measures, the assessment of cumulative effects, and the consideration of monitoring and follow-up programs and, where applicable, adaptation measures.

Certain issues relevant to the review process are firmly grounded in traditional and local knowledge, such as harvesting, land use, and physical and cultural heritage resources. Although the basis for traditional and local knowledge and science-based knowledge can differ, they may, on their own or together, contribute to the understanding of these issues.

The EA shall promote and facilitate the contribution of traditional and local knowledge to the review process. It is recognized that approaches to traditional and local knowledge, customs and protocols may differ among communities and persons with respect to the use, management and protection of this knowledge. The proponent shall incorporate into the EIS the traditional and local knowledge to which it has access or that it may reasonably be expected to acquire through appropriate due diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality.

Sustainable development

Sustainable development, as defined in the Act, means development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. Environmental assessment provides an effective means of integrating environmental factors into the planning and decision-making process in order to promote sustainable development.

Appendix 2: Comprehensive study process and public participation process

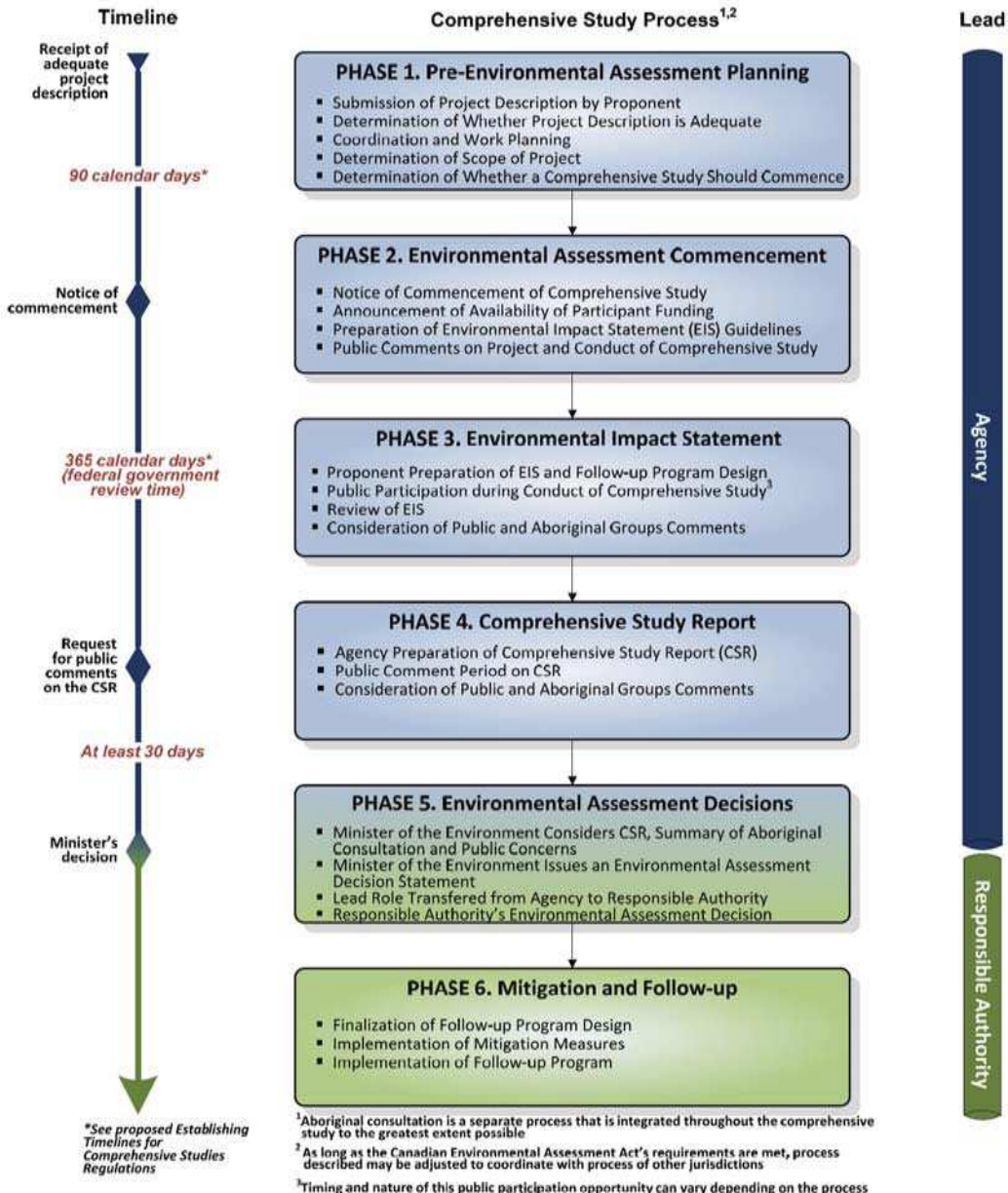


Canadian Environmental Assessment Agency

Agence canadienne d'évaluation environnementale

COMPREHENSIVE STUDY PROCESS *at a glance*

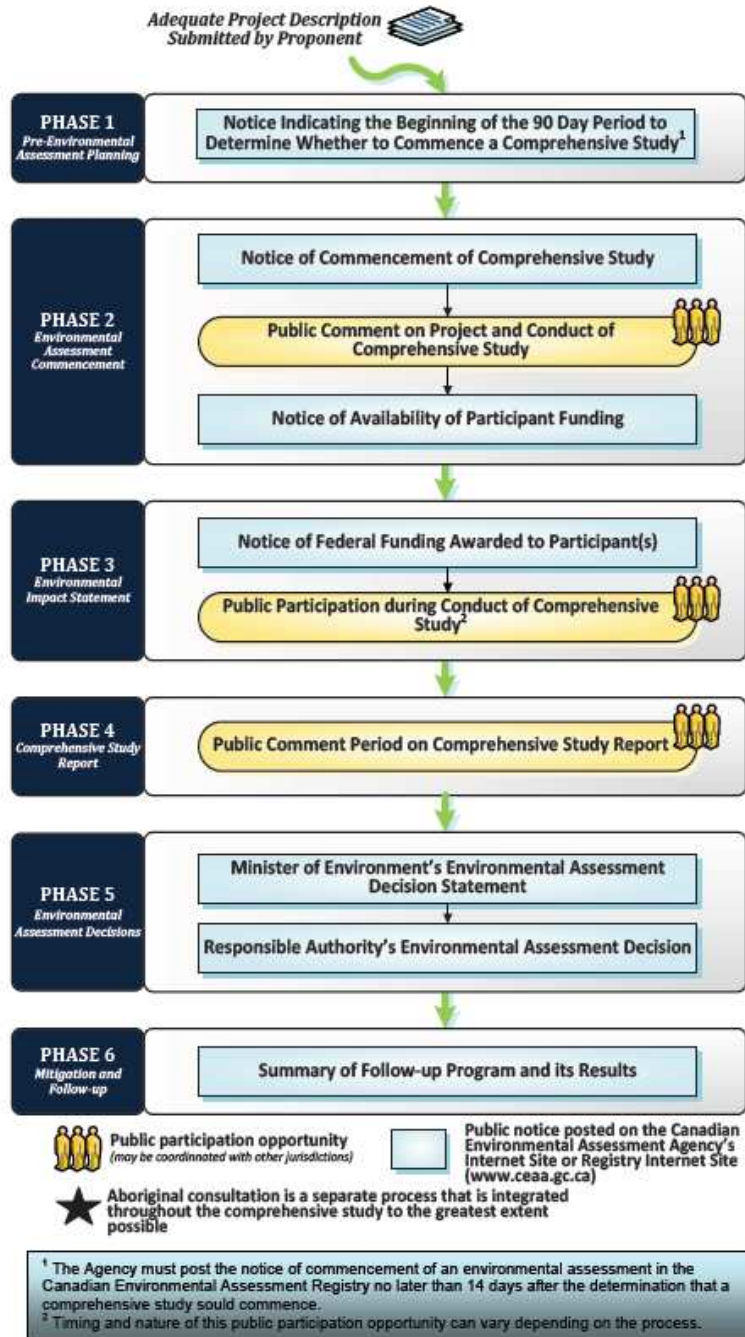
For Comprehensive Studies conducted by the Canadian Environmental Assessment Agency





PUBLIC NOTICES AND PUBLIC PARTICIPATION

For comprehensive studies conducted by the Canadian Environmental Assessment Agency



Appendix 3: Contacts

The contact information of the personnel responsible for the federal environmental assessment of this project is provided below:

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Appendix 4: Fish and fish habitat

Measures to mitigate the effects on fish habitat

When it is determined that a work or an activity will have adverse effects on fish habitat, the proponent must, after having considered and documented the possibility of relocating or modifying the project, plan mitigation measures in an effort to reduce the project's effects on fish habitat. The proponent must demonstrate that every effort has been made to minimize the project's effects on fish and fish habitat. The reasoning followed to determine whether the proposed measure reduces the significance of the effect on fish habitat must be explained.

The proponent can use the pathways of effects (available on DFO's website at www.dfo-mpo.gc.ca/habitat/what-quoi/pathways-sequences/index-eng.asp) to identify the potential effects and the mitigation measures that can be applied to reduce or eliminate effects on fish habitat.

Effects on fish and fish habitat after application of the mitigation measures

The proponent must demonstrate that every effort has been made to minimize the project's effects on fish and fish habitat. The effects of the project that remain, despite the application of mitigation measures, should be assessed based on the various works or activities.

In assessing the project's effects on fish habitat, the following aspects must be specifically considered:

- the consequences of the loss or alteration of watercourses and water bodies during the construction and operation phases (diversion, draining, reduction in surface water supply);
- the surface areas encroached, drained, flooded or altered temporarily or permanently by implementation of the project, including wetlands, with a description of these environments in connection with the various types of fish habitat affected (potential or confirmed);
- changes in hydrologic conditions and, if applicable, hydrodynamic conditions on fish habitat functions (spawning, rearing, growth, feeding, migration); and
- the need to maintain fish passage will have to be documented and, when required, a description must be provided of the structures that will help maintain fish movement both upstream and downstream.

Compensation of residual effects on fish habitat

Background

In order for a project to be used as a compensation project, it must first be approved by DFO and lead to either the creation of fish habitat, the restoration of degraded fish habitat or the improvement of natural habitat for a given species or function.

Although DFO can advise proponents throughout the process, it is the responsibility of the proponent to find, propose, carry out and monitor the effectiveness of a compensation project to offset the residual HADD of fish habitat for which the proponent is responsible. Once a satisfactory compensation project has been identified, it constitutes a condition of authorization issued under subsection 35(2) of the *Fisheries Act*.

In some instances, DFO may require a letter of credit from a bank covering the costs of the compensation and follow-up monitoring measures. In this case, the proponent will have to provide DFO with a breakdown of these costs.

Information required

As a guide, a compensation project proposal must include the following:

- A description of the problem to be corrected affecting fish habitat (e.g. degraded habitats, recruitment problem, habitats underrepresented in a system, suboptimal habitats, an obstacle to fish movement). The description should be accompanied by well-documented photos (location, date, etc.) of the site indicating the date on which these photos were taken. The proponent must ensure that the data and information collected to characterize the environment are sufficient, in terms of quantity and quality, to provide an accurate representation of the environment as it currently exists.
- Identification of the fish habitat functions that will be developed and the species targeted by the development projects.
- A description of the habitat compensation development projects considered in order to improve on the current situation (e.g. structure dismantling, addition of a spawning ground, installation of riffles, cleaning, reprofiling and vegetation of a site, improvement in flow conditions).
- The size of the development projects (surface area, distance, etc.).
- The exact location (name of the watercourse, latitude and longitude) of each site to be developed and their ownership status.

The type and amount of information to be provided can vary depending on the type of environment or development concerned. Proponents are therefore encouraged to consult DFO to determine the information requirements for each case. The purpose of this approach is to avoid investing too much time and effort in documenting an option that may not be approved.

Analysis by Fisheries and Oceans Canada

On receiving a compensation project proposal, DFO will determine whether the compensation project will actually produce gains (relevance analysis) and whether these gains are likely to be lasting (design analysis) and sufficient weighed against the HADD of fish habitat to be compensated (sufficiency analysis). Should DFO determine that the proposal is indeed relevant, that it is well-designed and that the associated gains will likely be sufficient, the compensation project will constitute a condition of the authorization that will be issued under the FA. This compensation plan will likely also be subject to review by Aboriginal groups, the public and regulatory agencies before being finalized and implemented.

Analysis of the relevance of the compensation project

The purpose of the relevance analysis by DFO is to validate whether the proposed compensation project is likely to actually produce improvements over the current situation. The relevance analysis will depend on the quality of the description of the problem to be corrected or the improvement made by the compensation project. It is at this stage that DFO will assess its degree of comfort with the choice of species and habitat function targeted by the compensation project and its location relative to the HADD of fish habitat.

Analysis of the design of the compensation project

The objectives of the analysis of the design of the proposed compensation project are to validate whether the characteristics of the development meet the needs of the target species and whether there is a good probability that the development will be lasting. This analysis also aims to verify whether the components of the development are realistic and have no unacceptable collateral effects (e.g. access road that is too large).

Analysis of habitat gains

The purpose of this step is to validate that the compensation project chosen provides gains that are sufficient when weighed against the HADD of fish habitat caused by the project. Like the relevance analysis, there are no precise rules for determining whether a compensation project provides sufficient gains. This assessment of the gains is based on professional experience and the available information concerning both anticipated habitat losses and the environment in which the development will be carried out. The aspects considered in the analysis include:

- the species affected by the loss and the compensation development project;
- the function(s) of the habitat lost and developed (feeding, spawning, migration, etc.);
- the rarity of the habitat lost and developed;
- the area of habitat lost and the area of habitat developed;
- the quality of the habitat lost;

- the magnitude of the anticipated effect (harmful alteration, disruption or destruction);
- the expected gains associated with the compensation relative to the current habitat; and
- The delay between the time a loss is caused and the time when the compensation development project will produce the expected gains.

Approach to the search for a compensation project

Considering the difficulties involved in devising compensation projects, evaluating their relevance, ensuring that they are well-designed and properly implemented and followed up, the compensation approach should favour the implementation of large projects that have a good chance of success rather than the implementation of several small and geographically scattered development projects.

Priority should be given to compensation proposals that will be carried out in the watershed of the river affected or in neighbouring water bodies or rivers. However, compensation developments in areas further away could be considered where justified. This might be justified if it is not feasible to carry out relevant developments locally, a compensation opportunity exists which is likely to produce greater gains or with a greater likelihood of success elsewhere, a more favourable cost-benefit ratio for fish habitat, a regional interest or technical considerations.

DFO is willing to consider compensation developments aimed at the habitats of species other than those affected by the HADD of fish habitat, provided that these other species are valued by users in the area and valid supporting arguments are presented.

DFO is also willing to consider development strategies aimed at restoring fish passage or opening up territory for valued species. It should be noted that it will be necessary to involve without delay the various relevant provincial, federal or Aboriginal stakeholders.

The follow-up program is developed in order to verify the accuracy of the predictions made in the assessment of the impacts on fish and fish habitat, as well as to assess the effectiveness of the proposed mitigation measures. The proponent must identify the targeted fish habitat components as well as the objectives for which follow-up is required. In light of the information provided, DFO will develop the follow-up program which, once approved by the proponent, will form an integral part of the authorization that will be issued. Once the authorization has been issued, the proponent must prepare and submit to DFO for approval the follow-up protocol(s) for meeting the program objectives. In light of the follow-up program's results, DFO may require that new mitigation measures be implemented or that certain unanticipated impacts be compensated, if applicable.