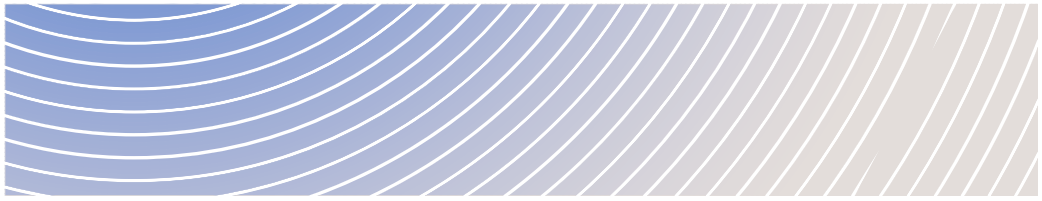
ST. LAWRENCE FLUORSPAR MARINE SHIPPING TERMINAL PROJECT



GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT PURSUANT TO THE *CANADIAN ENVIRONMENTAL ASSESSMENT ACT, 2012*

September 2019

Impact Assessment Agency of Canada | Agence d'évaluation d'impact du Canada

Canada

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Disclaimer

This document is not a legal authority, nor does it provide legal advice or direction; it provides information only, and must not be used as a substitute for the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) or its regulations. In the event of a discrepancy, CEAA 2012 and its regulations prevail. Portions of CEAA 2012 have been paraphrased in this document, but will not be relied upon for legal purposes.

List of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
Agency	Impact Assessment Agency of Canada
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
EA	environmental assessment
IAA	*Impact Assessment Act*
VC	valued component

PART 1 - KEY CONSIDERATIONS

1. Introduction

The purpose of this document is to identify for the proponent the minimum information requirements for the preparation of an Environmental Impact Statement (EIS) for a designated project[1] to be assessed pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). On August 28, 2019, the *Impact Assessment Act* (IAA) came into force and CEAA 2012 was repealed. However, in accordance with the transitional provisions of the IAA, the environmental assessment of this project is continuing under CEAA 2012 as if it had not been repealed.

This document specifies the nature, scope and extent of the information required. Part 1 of this document defines the scope of the environmental assessment (EA) and provides guidance and general instruction that must be taken into account in preparing the EIS. Part 2 outlines the information that must be included in the EIS.

Section 5 of CEAA 2012 describes the environmental effects that must be considered in an EA, including changes to the environment and effects of changes to the environment. The factors that are to be considered in an EA are described under section 19 of CEAA 2012. The Impact Assessment Agency of Canada (the Agency) or a review panel will use the proponent's EIS and other information received during the EA process to prepare a report that will inform the issuance of a decision statement by the Minister of Environment and Climate Change. Therefore the EIS must include a full description of the changes the project will cause to the environment that may result in adverse effects on areas of federal jurisdiction (i.e. section 5 of CEAA 2012) including changes that are directly linked or necessarily incidental to any federal decisions that would permit the project to be carried out. The EIS must also include a list of the mitigation measures that the proponent proposes to undertake in order to avoid or minimize any adverse environmental effects of the project. It is the responsibility of the proponent to provide sufficient data and analysis on potential changes to the environment to ensure a thorough evaluation of the environmental effects of the project by the Agency or review panel.

[1] In this document, "project" has the same meaning as "designated project" as defined in CEAA 2012.

2. Guiding Principles

2.1. Environmental assessment as a planning and decision making tool

EA is a process to predict environmental effects of proposed projects before they are carried out. An EA:

- identifies potential adverse environmental effects;
- proposes measures to mitigate adverse environmental effects;
- predicts whether there will be significant adverse environmental effects, after mitigation measures are implemented; and
- includes a follow-up program to verify the accuracy of the EA and the effectiveness of the mitigation measures.

2.2. Public participation

One of the purposes identified in CEAA 2012 is to ensure that opportunities are provided for meaningful public participation during an EA. CEAA 2012 requires that the Agency provide the public with an opportunity to participate in the EA. For EAs led by the Agency the public has an opportunity to comment on the draft EA report. For EAs by a review panel, CEAA 2012 requires that the review panel hold a public hearing. Additional opportunities for participation may also be provided.

Meaningful public participation is best achieved when all parties 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.

2.3. Engagement with Indigenous groups

The proponent is expected to engage with potentially affected Indigenous groups starting as early as possible in the project planning process in order to fulfil the statutory obligations of CEAA, 2012 to assess environmental effects of the proposed project on Indigenous peoples.

The proponent is expected to work with potentially affected Indigenous groups to establish an engagement approach. The proponent will make reasonable efforts to integrate Indigenous knowledge into the assessment of environmental effects. For more information on requirements for the effects assessment, see Part 2,

Section 7.1.10 and Section 7.3.6 of these guidelines. For more information on incorporating Indigenous knowledge, refer to Part 1, Section 4.2.2 of these guidelines.

2.4. Application of the precautionary approach

In documenting the analyses included in the EIS, the proponent will demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to avoid significant adverse environmental effects.

3. Scope of the Environmental Assessment

3.1. Designated project

On May 31, 2019, Canada Fluorspar (NL) Inc., the proponent of the St. Lawrence Fluorspar Marine Shipping Terminal Project, provided a project description to the Agency. Based on this project description, the Agency has determined that an EA is required under CEAA 2012 and will include the construction, operation, decommissioning and abandonment of the following project components:

Marine shipping terminal

Components:

- Wharf;
- Breakwater;
- Berthing areas, ship manoeuvring areas, the approach channel and anchoring areas;
- Sediment disposal site(s) in the aquatic environment;
- Administrative, maintenance and technical buildings, and the electrical substation associated with the marine shipping terminal.

Activities:

- Operation of the marine shipping terminal;
- Waste management, cargo residues and hazardous materials;
- Site preparation and management of cut-and-fill material;
- Ballast water management;

- Marine transportation within the boundaries of the marine shipping terminal and within the 12 nautical mile limit of Canada's territorial sea.

Aggregate and fluorspar concentrate management

Components:

- Access roads;
- Sediment disposal site(s);
- Temporary facilities needed for the construction of the project;
- Ore, low-grade ore, waste rock, overburden, and top soil stockpile areas;
- Waste-rock crushing plant;
- Construction aggregate processing facility;
- Storage facilities for petroleum products, reagents and hazardous materials;
- Water management facility, including wastewater treatment;
- Water supply (industrial and drinking);
- Power supply;
- Administrative, maintenance and storage buildings.

Activities:

- Site clearing, earthmoving, leveling and drilling activities;
- Crushing and processing of waste rock, aggregate production, waste rock stockpiling;
- Fluorspar concentrate and aggregate transhipment, storage and handling;
- Water management;
- Management of waste and recycling;
- Maintenance of structures, infrastructure and facilities;
- Waste snow management.

3.2. Factors to be considered

Scoping establishes the parameters of the EA and focuses the assessment on relevant issues and concerns. Part 2 of this document specifies the factors to be considered in the EA, including the factors listed in subsection 19(1) of CEAA 2012:

- 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 physical activities that have been or will be carried out;
- the significance of the effects referred to above;
- comments from the public;

- mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- the requirements of the follow-up program in respect of the project;
- 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;
- any change to the project that may be caused by the environment; and
- the results of any relevant regional study pursuant to CEAA 2012.

3.2.1. Changes to the environment

Environmental effects occur as interactions between actions (the carrying out of the project or decisions made by the federal government in relation to the project) and receptors in the environment, and subsequently between components of the environment (e.g. change in water quality that may affect fish).

Under CEAA 2012, an examination of environmental effects that result from changes to the environment as a result of the project being carried out or as a result of the federal government exercising any power duty or function that would allow the project to be carried out must be considered in the EIS.

In scoping the potential changes to the environment that may occur, the proponent should consider any potential changes in the physical environment such as changes to air quality, water quality and quantity, and physical disturbance of land that could reasonably be expected to occur.

3.2.2. Valued components to be examined

Valued components (VCs) refer to environmental biophysical or human features that may be impacted by a project. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. For example, it may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

The proponent must conduct and focus its analysis on VCs as they relate to **section 5 of CEAA 2012,** including the ones identified in Section 6.2 (Part 2) of these guidelines that may be affected by changes in the environment, as well as species at risk and their critical habitat as per the requirement outlined in section 79 of the *Species at Risk Act*. Section 5 of CEAA 2012 defines environmental effects as:

- a change that may be caused to fish and fish habitat, marine plant and migratory birds;
- a change that may be caused to the environment on federal lands, within another province or outside Canada;
- with respect to Indigenous peoples, an effect of any change that may be caused to the environment on:
  - health and socio-economic conditions;
  - physical and cultural heritage;
  - the current use of lands and resources for traditional purposes; or
  - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

- for projects requiring a federal authority to exercise a power or perform a duty or function under another Act of Parliament:
  - a change, other than the ones mentioned above, that may be caused to the environment and that is directly linked or necessarily incidental to the exercise of the federal power or the performance of a duty or function; and
  - the effect of that change, other than the effects mentioned above, on:
    - health and socio-economic conditions,
    - physical and cultural heritage, or
    - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The list of VCs presented in the EIS will be completed according to the evolution and design of the project and reflect the knowledge acquired through public consultation and engagement with Indigenous groups. The EIS will describe what methods were used to predict and assess the adverse environmental effects of the project on these VCs.

The VCs will be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential for environmental effects arising from the project activities. The EIS will provide a rationale for selecting specific VCs and for excluding any VCs or information specified in these guidelines. Challenges may arise regarding particular exclusions, so it is important to document the information and the criteria used to justify the exclusion of a particular VC or piece of information. Justification may be based on, for example, primary data collection, computer modelling, literature references, public participation or engagement with Indigenous groups, or expert input or professional judgement. The EIS will identify those VCs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or that the proponent considers likely to be affected by the project. In doing so, the EIS will indicate to whom these concerns are important (i.e. the public or Indigenous groups) and the reasons why, including environmental, cultural, historical, social, economic, recreational, and aesthetic considerations, and traditional knowledge. If comments are received on a component that has not been included as a VC, these comments will be summarized and the rationale for excluding the component will address the comments.

3.2.3. Spatial and temporal boundaries

The spatial and temporal boundaries used in the EA may vary depending on the VC and will be considered separately for each VC, including for VCs related to the current use of lands and resources for traditional purposes by Indigenous peoples, or other environmental effects referred to under paragraph 5(1)(*c*) of CEAA 2012. The proponent is encouraged to consult with the Agency, federal and provincial government departments and agencies, local government and Indigenous groups, and take into account public comments when defining the spatial and temporal boundaries used in the EIS.

The EIS will describe the spatial boundaries, including local and regional study areas, of each VC to be used in assessing the potential adverse environmental effects of the project and provide a rationale for each boundary. Spatial boundaries will be defined taking into account the appropriate scale and spatial

extent of potential environmental effects, community knowledge and Indigenous traditional knowledge, current or traditional land and resource use by Indigenous groups, ecological, technical, social and cultural considerations. The spatial boundaries, for example, should take into account the areas that could potentially be affected by the worst-case scenario for dispersal of fuel oil or cargo, or other scenarios considered in the assessment of the potential effects related to accidents and malfunctions and vessel strike.

The temporal boundaries of the EA will span all phases of the project determined to be within the scope of this EA as specified under section 3.1 above. If effects are predicted after project decommissioning, this should be taken into consideration in defining boundaries. Community knowledge and Indigenous traditional knowledge should factor into decisions around defining temporal boundaries.

If the temporal boundaries do not span all phases of the project, the EIS will identify the boundaries used and provide a rationale.

4. Preparation and Presentation of an Environmental Impact Statement

4.1. Guidance

The proponent should consult the Agency policy and guidance on topics to be addressed in the EIS, which is available on the Agency's website, and liaise with the Agency during the planning and development of the EIS. The proponent should also consult relevant guidance from other federal departments and ensure that the most up to date version is being used.

The proponent is encouraged to engage with Indigenous groups on the planning and development of relevant sections of the EIS, including effects from changes to the environment and impacts to Indigenous interests, as well as an assessment of environmental effects as outlined in paragraph 5(1)(c) of CEAA 2012.

Submission of regulatory and technical information necessary for federal authorities to make their regulatory decisions during the conduct of the EA is at the discretion of the proponent. Although that information is not necessary for the EA decision, the proponent is encouraged to submit it concurrent with the EIS. While the EIS must outline applicable federal authorizations required for the project to proceed, the proponent must provide information relevant to the regulatory role of the federal government. It should be noted that the issuance of these other applicable federal legislative, regulatory and constitutional requirements are within the purview of the relevant federal authorities, and are subject to separate processes post EA decision.

4.2. Use of information

4.2.1 Government expert advice

Section 20 of CEAA 2012 requires that every federal authority with specialist or expert information or knowledge with respect to a project subject to an EA must make that information or knowledge available to the Agency or the review panel. The Agency will advise the proponent of the availability of pertinent information or knowledge or expert and specialist knowledge received from other federal authorities or other levels of government so that it can be incorporated into the EIS.

4.2.2 Community knowledge and Aboriginal traditional knowledge

Sub-section 19(3) of CEAA 2012 states that “the environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge”. For the purposes of these guidelines, community knowledge and Aboriginal traditional knowledge refers to knowledge acquired and accumulated by a local community or an Indigenous group.

The proponent will incorporate into the EIS the community knowledge and Aboriginal traditional knowledge to which it has access or that is acquired through public participation and engagement with Indigenous groups, in keeping with appropriate ethical standards and obligations of confidentiality. The proponent will engage in a respectful dialogue with Indigenous groups about the collection and use of Aboriginal knowledge and enter into agreements where necessary regarding the use of information during and after the EA. The proponent should collaborate with Indigenous groups to ensure, where possible, that the Aboriginal knowledge is incorporated into the EIS in a way that is appropriate for the Indigenous group. The proponent will integrate Aboriginal traditional knowledge into all aspects of its assessment including both methodology (e.g. establishing spatial and temporal boundaries, defining significance criteria) and analysis (e.g. baseline characterization, effects prediction, development of mitigation measures). Agreement should be obtained from Indigenous groups regarding the use, management and protection of their existing traditional knowledge information during and after the EA. For more information on how Aboriginal traditional knowledge can be obtained and incorporated in the preparation of the EIS, please refer to the Agency’s reference guide on the topic. Should there be a lack of Aboriginal knowledge, the proponent is still expected to seek information from other sources to complete the assessment of effects of changes to the environment on Indigenous peoples or the assessment of impacts to Indigenous interests. For more information on requirements for the effects assessment, see Part 2, Section 7.1.10 and 7.3.6 of these guidelines.

4.2.3 Existing information

In preparing the EIS, the proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet requirements of the EIS Guidelines, the proponent will

either include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e. through cross-referencing). When relying on existing information, the proponent will also comment on how the data were applied to the project, separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from the existing information.

4.2.4 Confidential information

In implementing CEAA 2012, the Agency is committed to promoting public participation in the EA of projects and providing access to the information on which EAs are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the EA are included in the Canadian Impact Assessment Registry and made available to the public on request. For this reason, the EIS will not contain information that:

- is sensitive or confidential (i.e. financial, commercial, scientific, technical, personal, cultural or other nature), that is treated consistently as confidential, and the person affected has not consented to the disclosure; or
- may cause substantial harm to a person or specific harm to the environment through its disclosure.

The proponent will consult with the Agency regarding whether specific information requested by these guidelines should be treated as confidential.

4.3. Study strategy and methodology

The proponent is expected to respect the intent of these guidelines and to consider the environmental effects that are likely to arise from the project (including situations not explicitly identified in these guidelines), the technically and economically feasible mitigation measures that will be applied, and the significance of any residual effects. Except where specified by the Agency, the proponent has the discretion to select the most appropriate methods to compile and present data, information and analysis in the EIS as long as they are justifiable and replicable.

It is possible these guidelines may include matters which, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, the proponent will clearly indicate it, and provide a justification so the Agency, federal authorities, Indigenous groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency or the review panel disagrees with the proponent's decision, it will require the proponent to provide the specified information.

The assessment will include the following general steps:

- identifying the activities and components of the project;
- predicting potential changes to the environment;
- predicting and evaluating the likely effects on identified VCs;
- identifying technically and economically feasible mitigation measures for any significant adverse environmental effects;

- determining any residual environmental effects;
- considering cumulative effects of the project in combination with other physical activities that have been or will be carried out; and
- determining the potential significance of any residual environmental effect following the implementation of mitigation measures.

For each VC, the EIS will describe the methodology used to assess project-related effects. The EIS could include an analysis of the pathway of the effects of environmental changes on each VC. The EIS will document where and how scientific, engineering, community knowledge and Aboriginal traditional knowledge were used to reach conclusions. Assumptions will be clearly identified and justified. All data, models and studies will be documented such that the analyses are transparent and reproducible. All data collection methods will be specified. The uncertainty, reliability, sensitivity and conservativeness of models used to reach conclusions must be indicated.

The EIS will identify all significant gaps in knowledge and understanding related to key conclusions, and the steps to be taken by the proponent to address these gaps. Where the conclusions drawn from scientific, engineering and technical knowledge are inconsistent with the conclusions drawn from Aboriginal traditional knowledge, the EIS will present each perspective on the issue and a statement of the proponent's conclusions.

The EIS will include a description of the environment (both biophysical and human), including the components of the existing environment and environmental processes, their interrelations as well as the variability in these components, processes and interactions over time scales appropriate to the likely effects of the project. The description will 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. These data should include results from studies done prior to any physical disruption of the environment due to initial site clearing activities. The information describing the existing environment may be provided in a stand-alone chapter of the EIS or may be integrated into clearly defined sections within the effects assessment of each VC. This analysis will include environmental conditions resulting from historical and present activities in the local and regional study areas.

If the baseline data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations will be described and will include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error. The proponent will provide the references used in creating their approach to baseline data gathering, including identifying where appropriate, the relevant federal or provincial standards. The proponent is encouraged to discuss the timeframe and considerations for its proposed baseline data with the Agency prior to submitting its EIS.

In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and community knowledge and Indigenous knowledge and perspectives regarding ecosystem health and integrity. The proponent will consider the resilience of relevant species populations, communities and their habitats. The assessment of environmental effects on Indigenous peoples, pursuant to paragraph 5(1)(*c*) of CEAA 2012, will undergo the same rigour and type of assessment as any other VC (including setting of spatial and temporal boundaries, identification and analysis of effects,

identification of mitigation measures, determination of residual effects, identification and a clear explanation of the methodology used for assessing the significance of residual effects and assessment of cumulative effects).

The proponent will consider the use of both primary and secondary sources of information regarding baseline information, changes to the environment and the corresponding effect on health, socio-economics, physical and cultural heritage and the current use of lands and resources for traditional purposes. Primary sources of information include traditional land use studies, socio-economic studies, heritage surveys or other relevant studies conducted specifically for the project and its EIS. Often these studies and other types of relevant information are obtained directly from Indigenous groups. Secondary sources of information include previously documented information on the area, not collected specifically for the purposes of the project, or desk-top or literature-based information. The proponent will provide Indigenous groups the opportunity to review and provide comments on the information used for describing and assessing effects on Indigenous peoples (further information on engaging with Indigenous groups is provided in Part 2, Section 5 of this document). The proponent will respond to the comments of Indigenous groups prior to submitting the EIS to ensure that the comments are adequately addressed. Where there are discrepancies in the views of the proponent and Indigenous groups on the information to be used in the EIS, the EIS will document these discrepancies and the rationale for the proponent's selection of information.

The assessment of the effects of each of the project components and physical activities, in all phases, will be based on a comparison of the biophysical and human environments between the predicted future conditions with the project and the predicted future conditions without the project. In undertaking the environmental effects assessment, the proponent will use best available information and methods. All conclusions will be substantiated. Predictions will be based on clearly stated assumptions. The proponent will describe how each assumption has been tested. With respect to quantitative models and predictions, the EIS will document the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained. Where there are discrepancies in the views of the proponent and Indigenous groups with respect to the outcomes of assessment(s), the EIS will document and provide a rationale for these discrepancies.

4.4. Presentation and organization of the environmental impact statement

To facilitate the identification of the documents submitted and their placement in the Canadian Environmental Assessment Registry, the title page of the EIS and its related documents will contain the following information:

- project name and location;
- title of the document, including the term "environmental impact statement";
- subtitle of the document;
- name of the proponent; and
- date of submission of the EIS.

The EIS will be written in clear, precise language. A glossary defining technical words, acronyms and abbreviations will be included. The EIS will include charts, diagrams, tables, maps and photographs, where appropriate, to clarify the text. Perspective drawings that clearly convey the various components of the project will also be provided. Wherever possible, maps will be presented in common scales and datum to allow for comparison and overlay of mapped features.

For purposes of brevity and to avoid repetition, cross-referencing is preferred. The EIS may make reference to the information that has already been presented in other sections of the document, rather than repeating it. Detailed studies (including all relevant and supporting data and methodologies) will be provided in separate appendices and will be referenced by appendix, section and page in the text of the main document. The EIS will explain how information is organized in the document. This will include a table of content with a list of all tables, figures, and photographs referenced in the text. A complete list of supporting literature and references will also be provided. A table of concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided. The proponent will provide copies of the EIS and its summary for distribution, including paper and electronic version in an unlocked, searchable PDF format, as directed by the Agency.

4.5. Summary of the environmental impact statement

The proponent will prepare a summary of the EIS in both of Canada's official languages (French and English) to be provided to the Agency at the same time as the EIS that will include the followings:

- a concise description of all key components of the project and related activities;
- a summary of the engagement with Indigenous groups, and the participation of the public and government agencies, including a summary of the issues raised and the proponent's responses;
- an overview of expected changes to the environment;
- an overview of the key environmental effects of the project, as described under section 5 of CEAA 2012, and proposed technically and economically feasible mitigation measures;
- an overview of how factors under paragraph 19(1) of CEAA 2012 were considered;
- the proponent's conclusions on the residual environmental effects of the project, and the significance of those effects, after taking into account the mitigation measures.

The summary is to be provided as a separate document and should be structured as follows:

1. Introduction and EA context
2. Project overview
3. Alternative means of carrying out the project
4. Public participation
5. Engagement with Indigenous Groups
6. Summary of environmental effects assessment for each VC, including:

   a. description of the baseline
   b. anticipated changes to the environment
   c. anticipated effects
   d. mitigation measures
   e. significance of residual effects
7. Follow-up and monitoring programs proposed

The summary will have sufficient details for the reader to understand the project, any potential environmental effects, proposed mitigation measures, and the significance of the residual effects. The summary will include key maps illustrating the project location and key project components.

PART 2 – CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

1. Introduction and Overview

1.1. The proponent

In the EIS, the proponent will:

- provide contact information (e.g. name, address, phone, fax, email);
- identify itself and the name of the legal entity(ies) that would develop, manage and operate the project;
- describe corporate and management structures;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.

1.2. Project overview

The EIS will describe the project, key project components and associated 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 EIS will outline the larger context.

The overview is to identify the key components of the project, rather than providing a detailed description, which will follow in Section 3 below.

1.3. Project location

The EIS will contain a description of the geographical setting in which the project will take place. This description will focus on those aspects of the project and its settings that are important in order to understand the potential environmental effects of the project. The following information will be included:

- the Universal Transverse Mercator (UTM) projection coordinates of the main project site;
- current land use in the area;
- distance of the project facilities and components to any federal lands;
- the environmental significance and value of the geographical setting in which the project will take place and the surrounding area;

- environmentally sensitive areas, such as national, provincial and regional parks, ecological reserves, wetlands, estuaries, habitats of federally or provincially listed species at risk, Important Bird and Biodiversity Areas (including Middle Lawn Island, Green Island, and Miquelon Island) and other sensitive areas;
- description of local communities; and
- traditional territories, Indian Reserve lands and Mi'kmaq harvesting regions and/or settlements.

1.4. Regulatory framework and the role of government

The EIS will identify:

- any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the project or associated activities;
- legislation and other regulatory approvals that are applicable to the project at the federal, provincial, regional and municipal levels;
- government policies, resource management plans, planning or study initiatives pertinent to the project and/or EA and their implications;
- whether a request will be or was made to Transport Canada's Marine Safety Directorate to undertake the TERMPOL review process;
- any treaty, self-government or other agreements between federal or provincial governments and Indigenous groups that are pertinent to the project and/or EA;
- any relevant land use plans, land zoning, or community plans;
- information on land lease agreement or land tenure, when applicable; and
- regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects.

2. Project Justification and Alternatives Considered

2.1. Purpose of the project

The EIS will describe the purpose of the project by providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent. If the objectives of the project are related to broader private or public sector policies, plans or programs, this information will also be included.

The EIS will also describe the predicted environmental, economic and social benefits of the project. This information will be considered in assessing the justifiability[2] of any significant adverse residual environmental effects as defined in section 5 of CEAA 2012, if such effects are identified.

2.2. Alternative means of carrying out the project

The EIS will identify and consider the environmental effects of alternative means of carrying out the project that are technically and economically feasible. The proponent will complete the assessment of alternative means in accordance with the Agency's Operational Policy Statement on this topic.

- In its alternative means analysis, the proponent will address, at a minimum, the following project components:
  - the location of the marine shipping terminal, approach channel and anchorage areas;
  - the wharf and breakwater: location, orientation, configuration and construction;
  - systems for fluorspar concentrate and aggregate transportation and ship loading (means and routing considered);
  - sediment management and sediment disposal sites, providing the reasoning for the selection of the disposal site, if applicable;
  - access to the project site;
  - location of key project components;
  - energy sources to power the project site;
  - management of water supply and waste water;
  - water management and location of the final effluent discharge points.

The Agency recognizes that projects may be in the early planning stages when the EIS is being prepared. Where the proponent has not made final decisions concerning the placement of project infrastructure, the technologies to be used, or that several options may exist for various project components, the proponent shall conduct an environmental effects analysis at the same level of detail for each of the various options available (alternative means) within the EIS.

[2] See subsection 52(2) of CEAA 2012.

3. Project Description

3.1. Project components

The EIS will describe the project, by presenting the project components, associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. Information should also be provided on the care and control of project components.

This will include:

Marine shipping terminal:

- marine shipping terminal infrastructure and facilities, specifying the types of vessels that will be used, the construction methods for the wharf (backfilling, sheet piling, pile driving), as well as the dimensions of the wharf and breakwater and related infrastructure, berthing areas, anchorage areas at the marine shipping terminal and in the navigation channel;
- permanent and temporary works related to open-water disposal sites or dewatering basins, if applicable, specifying the sediment management method and the size, type and volume of sediment to be disposed of;
- propeller scour and anticipated wake heights;
- details of vehicles and mobile equipment required to construct the marine shipping terminal (type, quantity);
- access roads at the site of the terminal, including their surface area, size, location, and orientation with respect to the wharf to be built;
- permanent and temporary linear infrastructure (e.g. conduits, power lines), indicating the route of the infrastructure concerned and their locations;
- maps and bathymetric data at an appropriate scale of the project area, local study area and regional study area, maps of established shipping lanes in the project area, and maps of the project's shipping trajectory. The maps shall also show the boundaries of the proposed site including UTM coordinates, the major existing infrastructure, adjacent land uses and any important environmental features such as Marine Protected Areas/Special Areas and lands outside of Canada;
- administrative buildings, garages, other ancillary facilities associated with the marine shipping terminal.

Aggregate and fluorspar concentrate management:

- access roads and transportation corridor to wharf, breakwater, concentrate storage building and aggregate production area (road, conveyor pipeline, power supply), identifying the route of each of these linear infrastructures, and the location and types of structure used for stream crossings;
- details of vehicles and mobile equipment required to transport aggregate and fluorspar concentrate from the mine to the marine shipping terminal, including the frequency and distance of transport;
- sediment disposal site(s) in on-land sites, specifying the sediment management method and the size, type and volume of sediment to be disposed of;

- fluorspar concentrate and aggregate transhipment, storage and handling areas, including service and power supply infrastructure and work surfaces;
- temporary structures required for project construction;
- waste rock, overburden, topsoil, low-grade ore storage and stock piles (footprint, locations, volumes, development plans and design criteria);
- waste-rock crushing plant and processing facilities (footprint, technology, location);
- storage areas for fuels, reagents and hazardous wastes;
- water management facilities proposed to control, collect and discharge surface drainage and groundwater seepage to the receiving environment from all key components of the mine infrastructure (e.g. pit water, underground mine water, mine effluent);
- drinking and industrial water requirements (source, quantity required, need for water treatment);
- energy supply (source, quantity);
- waste disposal (types of waste, methods of disposal, quantity);
- administrative buildings, garages, other ancillary facilities.

3.2. Project activities

The EIS will include descriptions of the construction, operation, decommissioning and abandonment associated with the proposed project.

This will include descriptions of the activities to be carried out during each phase, the location of each activity, expected outputs and an indication of the activity's magnitude and scale.

Although a complete list of project activities should be provided, the emphasis will be on activities with the greatest potential to have environmental effects. Sufficient information will be included to predict environmental effects and address concerns identified by the public and Indigenous groups. Highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment.

The EIS will include a summary of the changes that have been made to the project since originally proposed, including the benefits of these changes to the environment, Indigenous groups, and the public.

The EIS will include a schedule including time of year, frequency, and duration for all project activities.

The information will include a description of:

3.2.1. Site preparation and construction

Marine shipping terminal:

- activities to prepare the site for the construction of the marine shipping terminal, tree clearing, blasting (if applicable), placement of fill, any necessary water diversions, construction of outer and inner dikes or cofferdams, grading, boring, densification, preloading and compaction of soil;

- construction methods used to build the terminal (including concreting, filling and ground densification, installation of riprap, pile and sheet-pile driving);
- construction methods and dimensions of anchorage areas at the marine shipping terminal and in the navigation channel, if applicable;
- operation of light-duty and heavy-duty vehicles and mobile off-road equipment for employee transport and construction activities (e.g. type, quantity, power rating, name of model and model year);
- water management, including the shaping of ditches and sedimentation basins and the construction of well(s) and treatment and disposal system(s) for stormwater and wastewater (e.g. runoff from the site and ballast and bilge management, including invasive species management plans);
- stripping of the shoreline, management of cut-and-fill material and ballast water.

Aggregate and fluorspar concentrate management:

- site clearing, earthmoving, leveling and drilling activities;
- construction of access roads and project infrastructure.

3.2.2. Operation

Marine shipping terminal:

- operation of the marine shipping terminal;
- operations related to the trans-shipment, storage and handling of fluorspar concentrate and aggregate, including ship loading and conveyor operation and activities to the 12 nautical mile limit of Canada's territorial sea;
- management of waste, cargo residues and hazardous materials;
- management of runoff, drinking water and wastewater;
- maintenance dredging operations;
- dredge spoil disposal locations;
- navigation activities (number and frequency of trips); size and types of vessels, as well as traffic speed, tonnage and capacity of the ships, the schedule of operations of the marine shipping terminal, and the predicted increase in vessel traffic of similar size vessels resulting from the project; anticipated vessel routes and anchorages; ship manoeuvring areas and approach channel; icebreaking activities (time of year, frequency, duration, expected start and end dates); and ballast water management;
- associated activities such as ballasting, anchorage, maneuvering, loading, bunkering and fuel types used, pilotage and tugboat escort;
- activities related to resupplying ships;
- waste snow management.

Aggregate and fluorspar concentrate management:

- characterization and management of waste rock, aggregate and overburden (storage, handling and transport of the volumes generated, mineralogical characterization, potential for metal leaching and acid rock drainage);
- crushing and processing of waste rock, aggregate production, waste rock stockpiling;

- storage, handling and transport of fluorspar concentrate and aggregate, including operation of vehicles and mobile equipment for transport of materials (e.g. type, quantity, power rating, name of model and model year);
- water management, including storm water, process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release point(s));
- management of waste and recycling;
- storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials;
- road traffic (including the number, type, size and capacity of trucks, as well as the approximate arrival and departure times and the increase in traffic relative to the current situation);
- maintenance of the structures, infrastructure and facilities;
- characterization and management of workforce, including transportation, work schedules and lodging;
- waste snow management.

3.2.3. Decommissioning and abandonment

- the preliminary outline of a decommissioning and reclamation plan for any components associated with the project (removal of conveyor and ship-loading systems; breakwater rehabilitation);
- the ownership, transfer and control of the different project components;
- the responsibility for monitoring and maintaining the integrity of the remaining structures;
- for permanent facilities, a conceptual discussion on how decommissioning and abandonment could occur.

4. Public Participation and Concerns

The EIS will describe the ongoing and proposed public participation activities that the proponent will undertake or that it has already conducted on the project. It will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. The EIS will provide a summary of key issues raised related to the project and its potential effects to the environment as well as describe any outstanding issues and ways to address them.

5. Engagement with Indigenous Groups and Concerns Raised

As noted in Part 1, Section 2.3 of these guidelines, the Proponent is expected to engage with potentially affected Indigenous groups. For the purposes of developing the EIS, the proponent will engage with Indigenous groups that may be affected by the project, to obtain their views on:

- the project;
- effects of changes to the environment on Indigenous peoples (health and socio-economic conditions; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and current use of lands and resources for traditional purposes) pursuant to paragraph 5(1)(c) of CEAA 2012.

In order to allow the Indigenous groups to engage and provide views on the above, the proponent will provide the Indigenous groups with the following timely and relevant:

- opportunities to learn about the project including providing information about the proposed project (including but not limited to project design, location, potential effects, mitigation measures and follow-up and monitoring programs); and
- opportunities to provide input on the overall project; effects of changes to the environment on Indigenous peoples pursuant to paragraph 5 (1)(c) of CEAA, 2012 and potential adverse impacts of the project on Indigenous interests.

The proponent will structure its engagement activities to provide adequate time for groups to review and comment on the relevant information. Engagement activities are to be appropriate to the groups' needs, arranged through discussions with the groups and in keeping with established protocols, where available. The EIS will describe all efforts, successful or not, taken to solicit the information required from groups to support the preparation of the EIS. With respect to engagement activities, the EIS will document:

- the engagement activities undertaken with each group prior to the submission of the EIS, including the date and means of engagement (e.g. meeting, mail, telephone);
- document the main issues and comments raised during the engagement activities by each group and the proponent's responses (effort should be made to collate similar issues together along VCs identified in the EIS);
- any future planned engagement activities;
- where and how Indigenous groups' perspectives were integrated into and/or contributed to decisions regarding the project, design, construction, operation, decommissioning, abandonment, maintenance, follow-up and monitoring and associated potential effects (paragraph 5(1)(c)) and the associated mitigation utilized to manage those effects. The effects and mitigation measures should be clearly linked to VCs in the EIS as well as to specific project components or activities; and
- how engagement activities by the proponent allowed groups to understand the project and evaluate its impacts on their communities, activities, and interests. Where impacts are identified, provide a

discussion of how those would be managed or mitigated (and provide this information for each Indigenous group separately).

To assist with the provision of records as requested above, the Agency recommends the proponent create a tracking table of key issues raised by each Indigenous group and responses provided by the proponent.

For the groups expected to be most affected by the project, the proponent is expected to strive towards developing a productive and constructive relationship based on on-going dialogue with the groups in order to support information gathering and the effects assessment. These groups include:

- Miawpukek First Nation
- Qalipu First Nation

For the above groups, the proponent will strive to use primary data sources and hold face-to-face meetings to discuss concerns. The proponent will facilitate these meetings by making key EA summary documents (baseline studies, EIS, key findings, plain language summaries) accessible in advance. The proponent will ensure there are sufficient opportunities for individuals and groups to provide oral input in the language of their choice. If possible, the proponent should consider translating information for these groups into the appropriate Indigenous languages(s) in order to facilitate engagement activities during the EA. For any impacts identified during these engagement activities, the proponent will discuss approaches to manage or mitigate those impacts and make efforts to discuss the degree of those impacts after mitigation (residual effects) with Indigenous groups prior to submitting the EIS to the Agency (see Part 2, Section 7.1.10 and Part 2, Section 7.3.6 of these guidelines).

For groups that may also be affected by the project, but to a lesser degree, the proponent will, at a minimum, ensure these groups are notified about key steps in the EIS development process and of opportunities to provide comments on key EA documents and/or information to be provided regarding their community. The proponent will still ensure these groups are reflected in the baseline information and assessment of potential effects or impacts in the EIS (see Part 2, Section 7.1.10 of these guidelines).

The groups referenced above may change as more is understood about the environmental effects of the project and/or if the project or its components change during the EA. The Agency reserves the right to alter the list of groups that the proponent will engage as additional information is gathered during the EA. For the groups listed above or subsequently identified by the Agency, if potential effects or impacts are identified, requirements of Part 2, Section 6 and Section 7.3.6 of these guidelines would apply.

Upon receipt of knowledge or information of potential effects or adverse impacts to any Indigenous group, even those not listed above, the proponent shall provide that information to the Agency at the earliest opportunity.

With respect to the effects of changes to the environment on Indigenous peoples, the assessment requirements are outlined in Part 2, Sections 7.1.10 and Part 2, 7.3.6 of these guidelines. With respect to the assessment, requirements are outlined in Part 2, Section 6 of these guidelines.

6. Impacts to Indigenous Interests

With respect to potential adverse impacts of the project on Indigenous interests, the EIS will document for each group identified in Part 2, Section 5 of these guidelines (or in subsequent correspondence from the Agency):

- the Indigenous group's perspectives on the importance of the land on which the project is located and how it intersects with any land management uses and/or plans they may have;
- maps and data sets (e.g. fish catch numbers);
- potential adverse impacts of each of the project components and physical activities, in all phases, on Indigenous interests, including those raised by Indigenous groups;
- potential adverse impacts on Indigenous interests that have not been fully mitigated as part of the EA and associated engagement with Indigenous groups. Include perspective of potentially impacted Indigenous groups; and
- potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of potentially impacted Indigenous groups.

This information and assessment will be informed from engagement with Indigenous groups described in Part 2, Section 5 of these guidelines. The information sources, methodology and findings of the assessment of paragraph 5(1)(c) effects under CEAA 2012 may be used to inform the assessment of potential adverse impacts of the project on Indigenous interests. However, there may be distinctions between the adverse impacts on Indigenous interests and paragraph 5(1)(c) effects under CEAA 2012. The proponent will carefully consider the potential distinction between these two aspects and, where there are differences; will include the relevant information in its assessment.

7. Effects Assessment

7.1. Project setting and baseline conditions

Based on the scope of the project described in Section 3 (Part 1), the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and an analysis of those effects. Should other VCs be identified during the conduct of the EA, the baseline condition for these components will also be described in the EIS. To determine the appropriate spatial boundaries to describe the baseline information, refer to Section 3.2.3 (Part 1) of these guidelines. As a minimum, the EIS will include a description of the following environmental components.

7.1.1. Atmospheric environment

- a baseline survey of ambient air quality in the project areas and in the airshed likely to be affected by the project by identifying and quantifying emission sources for, but not limited to, the following contaminants: total suspended particulates, fine particulates smaller than 2.5 microns (PM2.5), respirable particulates of less than 10 microns (PM10), carbon monoxide (CO), sulphur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs), and all other toxic air pollutants (mobile and stationary sources);
- identify and quantify existing greenhouse gas emissions[3] by individual pollutant measured as kilotonnes of carbon dioxide (CO2) equivalent per year in the project study areas;
- direct and indirect sources of air emissions;
- current provincial/territorial/federal limits for greenhouse gas emission targets;
- current ambient noise levels at key receptor points (e.g. Indigenous groups or communities), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included;
- existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels, including spill-over light, night-time glare from point light sources and skyglow, and in any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons;
- multi-seasonal weather and climatic information, including historical records of relevant meteorological information for the marine terminal and surrounding marine environment (nearshore and offshore). Climatic information on the following weather elements should be provided:
    - precipitation;
    - mean, maximum and minimum air temperatures;
    - humidity;
    - visibility (frequency and duration of haze or fog);
    - wind speed and direction;
    - land- and vessel-based icing potential (e.g. freezing precipitation, freezing spray);
    - lightning (frequency of occurrence);
- analysis (frequency and magnitude) of extreme meteorological events that have the potential to adversely affect the project (e.g. tropical and extra-tropical storms); and
- list of consulted climate data sources, including but not limited to data from Environment and Climate Change Canada surface observation stations and moored weather buoys, as well as other land-based and/or offshore monitoring sites within the project area and surrounding marine environment. Sources of additional long-term observational data can be obtained from the International Comprehensive Atmosphere Ocean Dataset, the United States of America National Oceanographic and Atmospheric Administration database of tropical cyclone activity in the North Atlantic and its Climate Forecast System Reanalysis, and the Canadian Lightning Detection Network. Information about the sources of data used, such as instrument type, location and elevation, should be described.

[3] Greenhouse gas emissions include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

7.1.2. Geology and geochemistry

- the geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
- the relief, drainage, nature of the soils and surficial deposits as well as areas vulnerable to erosion or mass movements;
- the hydrographic network of the watercourses and water bodies concerned, along with the longitudinal profile and water levels (during peak flows, low flows and mean conditions) for segments of the watercourses directly affected by the project;
- the bathymetry and hydrological regime, including the mean annual flows of watercourses that could be affected by the project, mean daily and monthly flows, and low and peak flows;
- detailed bathymetry (wharves, approach channel and anchorage areas);
- for Mine Cove, surface and underwater current patterns and speeds, waves, tidal regime and water levels from tide gauges located nearby, at the marine shipping terminal site and, if applicable, along shipping routes;
- for Mine Cove, characterization of the bottom sediment, including quality and thickness, particle size and mobility at the site where the structures will be built;
- the sediment regime, including areas that are input sources (erosion), sediment transport and accumulation zones, and backfilling areas and around potential open-water sediment disposal sites;
- physicochemical characterization of sediments to be dredged and their toxicity, if applicable, using toxicity tests;[4]
- physicochemical characterization of sediments at open-water disposal sites;
- physicochemical characteristics of the affected watercourses;
- the geochemical characterization of waste rock, overburden and potential construction material in order to predict metal leaching and acid rock drainage,[5] including oxidation of primary sulphides and secondary soluble sulphate minerals;
- geological hazards that exist in the areas planned for the project facilities and infrastructure, including:
  - history of seismic activity in the area;
  - isostatic rise or subsidence;
  - landslides, slope erosion and the potential for ground and rock instability, and subsidence during and following project activities;
  - history of landslide-generated tsunamis if near a shoreline;
- baseline concentrations of contaminants of concern[6] within the local and regional study areas; and

[4] Environment Canada (2002), *Sediment Sampling Guide for Dredging and Marine Engineering Projects in the St. Lawrence River*, volumes 1 and 2. The Agency recommends that the proponent consult Environment and Climate Change Canada regarding the sediment sampling plan and the sediment analysis strategy.

[5] The manual produced by the Mine Environment Neutral Drainage Program, entitled, MEND Report 1.20.1, *"Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials"*, Version 0 - December 2009 is a recommended reference for use in acid rock drainage and metal leaching prediction.

[6] Contaminants of concern include, but are not limited to, selenium, sulphate, cadmium, nitrate and calcite.

- geochemical characterization of leaching potential, including, but not limited to, contaminants of concern from waste rock, pit walls and overburden.

7.1.3. Topography and soil

- baseline mapping and description of landforms and soils within the local and regional study areas;
- maps depicting soil depth by horizon and soil order within the project area to support soil salvage and reclamation efforts, and to outline potential for soil erosion;
- suitability of topsoil and overburden for use in the rehabilitation of disturbed areas.

7.1.4. Riparian, wetland and terrestrial environments

- characterization of soils in the excavation area, in terrestrial and riparian environments, with a description of their past use;
- topography, drainage, geology and hydrogeology, and the physicochemical characteristics of potential on-land sediment or soil disposal sites;
- characterization of the shoreline, banks, current and future flood risk areas, and wetlands (fens, marshes, peatlands, mudflats and eelgrass beds, etc.), including the location and extent of wetlands likely to be affected by project activities according to their size, type (class and form), the description of their ecological function (ecological, hydrological, wildlife, socioeconomic, etc.) and species composition;[7]
- plant and animal species (abundance, distribution and diversity) and their habitats, with a focus on species at risk or with special status that are of social, economic, cultural or scientific significance, as well as invasive alien species.

7.1.5. Groundwater and surface water

- hydrogeology, including:
  - hydrogeological context (e.g. hydrostratigraphy with aquifers and aquitards, major faults, etc.), including the delineation of key stratigraphic and hydrogeologic boundaries;
  - physical properties of the hydrogeological units (e.g. hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield);
  - groundwater flow patterns and rates;
  - a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow;
  - temporal changes in groundwater flow (e.g. seasonal and long term changes in water levels);
  - a delineation and characterization of groundwater - surface water interactions including temperature and the locations of groundwater discharge to surface water and surface water recharge to groundwater;
  - temperature changes in surface water as a result of groundwater-surface water interactions;

[7] Refer to the Canadian Wetland Classification System of the National Wetlands Working Group for more information.

  - changes to surface water quality, including seasonal changes in runoff entering watercourses;
- hydrogeological maps and cross-sections for the project area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells and strainers, groundwater types springs, surface waters, and project facilities. Groundwater levels, potentiometric contours, flow directions, groundwater divides and areas of recharge and discharge should be included;
- all groundwater monitoring wells, including their location, in respect to the project area, including geologic, hydrostratigraphic, piezometric and construction data (e.g. depths of surficial rock and bedrock, bedrock quality, fracture zones, piezometric levels, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit);
- monitoring protocol for collection of existing groundwater and surface water data;
- an appropriate hydrogeologic model for the project area, which discusses the hydrostratigraphy and groundwater flow systems; a sensitivity analysis will be performed to test model sensitivity to climatic variations (e.g. recharge) and hydrogeologic parameters (e.g. hydraulic conductivity);
- groundwater quality, including lab analytical results for metals, major ions and physical parameters, including temperature, with the interpretation of results for any anomalous values and for contaminants of concern;
- graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality;
- local and regional potable groundwater supplies, including their current use and potential for future use;
- bedrock fracture sizes and orientations in relation to groundwater flow;
- the delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components;
- hydrological regimes, including monthly, seasonal and annual water flow (discharge) data;
- for each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments);
- seasonal surface water quality, including analytical results (e.g. water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation for representative tributaries and water bodies including all sites to receive project effluents or runoff;
- any local and regional potable surface water resource;
- sediment quality analysis for key sites likely to receive effluents.

7.1.6. Marine environment

- marine water quality;
- bottom sediments, including quality, thickness, grain size and mobility;
- surface and subsurface current patterns, current velocities, waves (e.g. significant wave heights and peak periods for nearshore and offshore waters),[8] storm surges, long shore drift processes, tidal patterns, and tide gauges levels for the site, in proximity to the site, and along the shipping routes;

[8] Use the MSC50 Wind and Wave Hindcast Dataset to assess waves and include discussion regarding data limitations as it pertains to the location of the project (i.e. coastal effects). Consider nearshore wave processes where the MSC50 data is limited.

- available bathymetric information for the site and along shipping routes if applicable;
- ice climate in the regional study area and along the shipping routes, including ice formation and thickness, ridging, breakup, movement and control activities;
- ice conditions along the shipping routes will also be discussed with consideration of predicted climate change and its possible effect on the timing of ice formation in the future (e.g. sea-level rise due to eustatic or isostatic uplift or subsidence);
- fast-ice characteristics, including its surface area and seasonal stability at the site of the proposed marine shipping terminal and along the shipping routes;
- changing sea ice in all marine parts of the project, changing wave heights at the marine shipping terminal due to changing frequency and severity of tropical storms, changing sea level at the marine shipping terminal and in approaches;
- current marine noise levels, including a noise propagation model in the project area as well as site specific noise mitigation coefficient (depth, salinity, temperature and substrate);
- marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton, and eelgrass;
- marine fauna, including benthic organisms, fish, marine mammals and sea turtles and their associated habitat; and
- federally and provincially listed marine species at risk and their associated habitat;
- maps, at a suitable scale, indicating the surface area or zones occupied by the different types of algae surveyed.

7.1.7. Fish and fish habitat

It should be noted that under CEAA 2012 and this document, the definition of “fish” is that set out in section 2 of the *Fisheries Act*, which includes shellfish, crustaceans and other marine animals (e.g. marine mammals).

- characterization of fish populations that occur or migrate in the local and regional study areas, including the species, abundance, distribution and life stages, as well as information on surveys conducted and sources of available data (e.g. locations of sampling stations, sampling methods, date of capture, species surveyed);
- list of rare fish species known to be present (including cold water corals and invertebrates);
- description of freshwater and marine habitats by homogeneous section, including the vertical wall and the seabed, specifying the length of the section, depth, type of substrate, vegetation and benthos presence, abundance and diversity, and photos;
- a description of natural obstacles or existing structures (e.g. water crossings) that hinder the free passage of fish;
- maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, nursery, feeding, overwintering, migration routes, etc. These data must be related to the water depths (bathymetry) to identify the extent of the littoral zone of the water bodies;
- the description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area.

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.

7.1.8. Migratory birds and their habitat[9]

- birds and their habitats that are found or are likely to be found in the study area. This description may be based on existing sources, but supporting evidence is required to demonstrate that the data used are representative of the avifauna and habitats found in the study area. The existing data must be supplemented by surveys, if required;
- abundance, distribution, and life stages of migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other land birds) likely to be affected in the project area based on existing information, or surveys, as appropriate, to provide current field data;
- characterization of various ecosystems found in the project area, likely to be affected, based on existing information (land cover types, vegetation); and
- year-round migratory bird use of the area (e.g. winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys to provide current field data if appropriate.

7.1.9. Species at risk

- a list of all species at risk listed under the *Species at Risk Act* (fauna and flora) that may be affected by the project, using existing data and literature as well as surveys to provide current field data;
- a list of all species assessed by the Committee on the Status of Endangered Wildlife in Canada as extirpated, endangered, threatened and of special concern;[10]
- any published studies that describe the regional importance, abundance and distribution of species at risk including recovery strategies or plans. The existing data must be supplemented by surveys, as required; and
- information on residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.

[9] Surveys should be designed in light of the available references and recommendations in Environment and Climate Change Canada's document entitled "*Guidance for the Preparation of an Environmental Impact Statement and Useful References*" (2016) (available from the Department of Environment and Climate Change Canada), and in the Canadian Wildlife Service's Technical Report No. 508, *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson et al. 2009). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impacts on migratory birds.

[10] Proponents are encouraged to consult the Committee on the Status of Endangered Wildlife in Canada's latest annual report for a listing of the designated wildlife species posted on their website.

7.1.10. Indigenous peoples

The proponent shall gather and document baseline information in the EIS for each Indigenous group identified in Part 2, Section 5 of these guidelines (and any groups identified after these guidelines are finalized). The baseline information will:

- Describe and characterize the elements in paragraph 5(1)(c) of CEAA 2012 based on the spatial and temporal scope selected for the EA according to the factors outlined in Part 1, Section 3.2.3 of this document.
- Characterize the regional context of each of the elements of paragraph 5(1)(c) of CEAA 2012 to support the assessment of project related effects, including consideration of the differences of experiences by sub-populations within an Indigenous group, as appropriate (e.g. women, youth, elders, families) and cumulative effects.
- Be sufficient to provide a comprehensive understanding of the current state of each VC related to effects of changes to the environment on Indigenous peoples. Each of the VCs for effects of changes to the environment on Indigenous peoples is interrelated and therefore baseline information will often overlap.

The proponent should engage with Indigenous groups to understand where baseline information and the respective assessment fit appropriately. Note: VCs identified for biophysical assessment (such as fish and fish habitat) may contribute to assessment and conclusion of VCs related to effects of changes to the environment on Indigenous peoples.

Health and Socio-Economic Conditions

Baseline information is required for health[11] and socio-economic conditions. For health this includes the state of physical, mental and social well-being. For socio-economic conditions, as well as the economic and social activities of an individual Indigenous group, the baseline will include contextual information regarding their practices. Specific aspects that will be considered include:

- general information about Indigenous populations and sub-populations;
- sites or areas that are used by Indigenous people either for permanent residences or on a seasonal/temporary basis and the number of people that use each site or area identified;
- drinking water sources (permanent, seasonal, periodic, or temporary);
- consumption of country foods (i.e., traditional foods) including food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes, outside of the commercial food chain;
- which country foods are consumed by which groups, how frequently, and where these country foods are harvested;
- commercial activities (e.g. fishing, trapping, hunting, forestry, outfitting); and
- recreational uses.

[11] The proponent should refer to Health Canada's guidance documents in order to include the appropriate baseline information relevant to human health.

Physical and Cultural Heritage

Baseline information for physical and cultural heritage (including any site, structure or thing of archaeological, paleontological, historical or architectural significance) will consider all elements of cultural and historical importance to Indigenous groups in the area and is not restricted to artifacts considered under provincial heritage legislative requirements. Specific aspects that will be considered include, but are not limited to:

- burial sites;
- cultural landscapes;
- sacred, ceremonial or culturally important places, objects or things; and
- archaeological potential and/or artefact places.

Current Use of Lands and Resources for Traditional Purposes[12]

Baseline information for current use of lands and resources for traditional purposes will focus on the traditional activity (e.g. hunting, fishing, trapping, plant gathering) and include a characterization of all attributes of the activity that can be affected by environmental change. This includes understanding of the baseline conditions of the quality and quantity of resources (e.g. preferred species and perception of quality, cultural connections to species), access to resources (e.g. physical access, timing, seasonality, distance from community) and overall quality of the experience of the practice (e.g. noise, air quality, visual landscape and presence of others). Specific aspects that will be considered include, but are not limited to:

- location of traditional territory (including maps where available);
- location of reserves and communities;
- traditional uses currently practiced or practiced in living memory, including practices that an Indigenous group wants to engage in the future or recently did but cannot given the particular context;
- location of traditional uses including, hunting, trapping, and fishing camps, cabins and traditional gathering or teaching grounds;
- fish, wildlife, birds, plants or other natural resources and their habitats of importance for traditional use;
- places where fish, wildlife, birds, plants or other natural resources are harvested, including places that are preferred;
- access and travel routes for conducting traditional practices;
- frequency, duration or timing of traditional practices;
- cultural values and importance associated with the area affected by the project and the traditional uses identified;
- other current uses identified by Indigenous groups.

Any other baseline information that supports the analysis of predicted effects on Indigenous peoples will be included as necessary.

[12] The proponent should refer to the Agency's guidance documents related to current use of lands and resources for traditional purposes in order to include the appropriate baseline information relevant to current use.

The EIS will also indicate how input, including Indigenous knowledge, from groups was used in establishing the baseline conditions related to health and socio-economics, physical and cultural heritage and current use of lands and resources for traditional purposes. Information collected as part of Section 6 can be used to inform the baseline information for the elements of 5(1)(c) listed above.

Should there be a lack of Indigenous knowledge; the proponent is still expected to seek information from other sources[13] sufficient enough to allow for a complete assessment of effects to be presented in the EIS. For more information on requirements for the effects assessment, see Part 2, Section 7.3.6 of these guidelines.

7.1.11. Other changes to the environment arising as a result of a federal decision or due to changes on federal lands, within another province or outside Canada

Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands, lands in another province or lands outside Canada, the EIS will include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines). For example, if an authorization provided under the *Fisheries Act* was to result in the flooding of key wildlife habitat, baseline information should be provided on the wildlife species likely to be affected.

7.1.12. Human environment

- the rural and urban settings likely to be affected by the project;
- any federal lands (waters), lands located outside the province or Canada that may be affected by the project;
- the current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters, including:
  - seasonality of these activities;
  - commercial, recreational and Indigenous fisheries statistics (e.g. species, annual catch and number of licences);
- maps of fishing areas in the project area and descriptions of their relative importance in a broader regional context (e.g. representation percentage of regional landings or economic value); and
- an inventory, description (including maps) and evaluation of any archaeological, cultural and historical resources, sites or practices that may be affected by the marine shipping associated with the project;
- current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available;[14]

[13] The proponent should refer to the Agency's guidance documents related to current use of lands and resources for traditional purposes in order to include the appropriate baseline information relevant to current use.

[14] The Agency recommends that the proponent submit a sediment sampling plan to Environment and Climate Change Canada. Natural Resources Canada recommends that it includes, both for the dredged and disposal sites:

- a description of the types of vessels currently operating in the region, particularly those likely to be encountered by vessels associated with the project. Variations in traffic density statistics, types cargo, and ports of origin and destination should also be described;
- location of and proximity of any permanent, seasonal or temporary residences or camps;
- health[15] and socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities;
- physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

7.2. Predicted changes to the physical environment

The EA will include a consideration of the predicted changes to the environment as a result of the project being carried out or as a result of any powers, duties or functions that are to be exercised by the federal government in relation to the project. These predicted changes to the environment are to be considered in relation to each phase of the project (construction, operation, decommissioning, and abandonment) and are to be described in terms of the magnitude, geographic extent, duration and frequency, and whether the environmental changes are reversible or irreversible. As changes to various parts of the physical environment, listed below, may be inter-related as part of an ecosystem, the EIS will explain and describe the connections between the changes described.

7.2.1. Changes to the atmospheric environment

- changes in air quality as a result of project activities including: marine shipping; and transportation of aggregate and fluorspar concentrate from the mine to the marine shipping terminal. Describe proposed mitigation measures (e.g. control equipment) that would be implemented to minimize atmospheric emissions throughout the project life cycle, as well as the assumed performance of the emission control approaches. Include:
  - description of emissions sources (e.g. type, quantity, fuel consumption, emission rate)
  - emission estimates for each emission source including but not limited to the following contaminants: total suspended particulates, fine particulates smaller than 2.5 microns ($PM_{2.5}$), respirable particulates of less than 10 microns (PM_{10}), carbon monoxide (CO), sulphur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and all other toxic air pollutants (mobile and stationary sources) associated with all phases of the project:
- methods and calculations used for analysis of air quality;

- methods tests used for classification;
- bathymetric maps that will be used, or if new data will be collected.

[15] The proponent should refer to Health Canada's guidance documents in order to include the appropriate baseline information relevant to human health.

- comparison of anticipated air quality concentration against the Canadian Ambient Air Quality Standards and relevant federal and/or provincial criteria for other contaminants of potential concern;
- an estimate of the direct greenhouse gas emissions associated with all phases of the project as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by source and individual pollutant and should also be summarized in CO_2 equivalent per year. The proponent is responsible for the following:
    - provide an estimate of the contribution of the project emissions at the local, provincial and federal scale, and indicate the category into which the project falls in terms of the relative magnitude of its contribution to GHG emissions (project with low, medium or high emission rates);justify all estimates and emission factors used in the analysis;
    - provide the methods and calculations used for the analysis;
    - compare and assess the level of estimated emissions of greenhouse gases to the regional, provincial and federal emission targets;
- changes in ambient noise levels; and
- changes in night-time light levels.

7.2.2. Changes to groundwater and surface water

- changes to groundwater flow patterns, fluxes, and divides based on the results of groundwater flow modelling that incorporates changes related to the project;
- changes to turbidity, oxygen level, water temperature, ice regime, water quality;
- changes in surface water quality associated with any project effluent releases or surface runoff;
- changes to water quality attributed to acid rock drainage and metal leaching associated with the storage of waste rock, ore, low-grade ore, overburden and potential construction material, including:
    - short-term metal leaching properties;
    - longer-term rates of acid generation (if any) and metal leaching;
    - estimates of the potential for mined materials (including waste rock and low-grade ore) to be sources of acid rock drainage or metal leaching;
    - estimates of lag time to onset of acid rock drainage and metal leaching for potentially acid-generating materials;
    - quantity and quality of leachate from samples of waste rock and ore;
    - quantity and quality of effluent to be released from the site into the receiving waters;
    - quality of humidity cell or column test liquid from acid rock testing;
    - sensitivity analysis to assess the effects of imperfect segregation of waste rock;
    - pit water chemistry during operation and post-closure, and pit closure management measures (e.g. flooding). This will include geochemical modelling of pit water quality in the post-closure period;
    - surface and seepage water quality and quantity (e.g. seepage capture rate and total amount of seepage) from the waste rock dumps, tailings/waste rock impoundment facility, stockpiles and other infrastructure during operation and post-closure;
- changes to the hydrological and hydrometric conditions;
- changes to groundwater recharge/discharge areas and any changes to groundwater infiltration areas;

- changes to groundwater quality associated with storage or release of any project effluents or drainage including surface runoff.

7.2.3. Changes to geomorphology and watercourse characteristics

- changes in the physicochemical quality of the water (contaminant concentrations, turbidity, oxygen content, etc.) and comparison of the projected water quality with the Canadian Environmental Quality Guidelines;
- impact of the changes on hydrodynamic conditions (current velocity and distribution), the ice regime and the thermal regime;
- shoreline and bank erosion;
- impact of the changes in the sediment regime and identification of potential areas of re-sedimentation of suspended particles;
- environmental contamination caused by resuspension of contaminants;
- changes in underwater noise levels.

7.2.4. Changes to riparian, wetland and terrestrial environments

- overall description of changes related to landscape disturbance;
- changes to the habitat of migratory and non-migratory birds, with a distinction made between the two birds category, including losses, structural changes and fragmentation of riparian habitat (aquatic grassbeds, intertidal marshes) of terrestrial environments and wetlands frequented by birds (types of cover, ecological unit of the area in terms of quality, quantity, diversity, distribution and functions);
- changes to critical habitat for federally listed species at risk;
- changes to key habitat for species important to current use of lands and resources for traditional purposes.

7.3. Predicted effects on valued components

Based on the predicted changes to the environment identified in Section 6.2, the proponent is to assess the environmental effects of the project on the following VCs. All interconnections between VCs and between changes to multiple VCs will be described.

7.3.1. Fish and fish habitat

- the identification of any potential adverse effects to fish and fish habitat as defined in subsection 2(1) of the Fisheries Act, including the calculations of any potential habitat loss (temporary or permanent) in

terms of surface areas (e.g. spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of:

  - the geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g. modification of substrates, dynamic imbalance, silting of spawning beds);
  - the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g. reproduction, fry-rearing, movements);
  - potential effects on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat;
  - any potential imbalances in the food web in relation to baseline conditions;
  - effects on the primary and secondary productivity of water bodies and how project-related effects may affect fish food sources;
- the effects of changes to the aquatic environment on fish and their habitat, including:
  - the anticipated changes in the composition and characteristics of the populations of various fish species, including shellfish and forage fish;
  - any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barriers);
  - any reduction in fish populations as a result of potential overfishing due to increased access to the project area;
  - any modifications and use of habitats by federally or provincially listed fish species;
- a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential effects resulting from overlapping periods;
- a review of the increase of ambient underwater noise levels generated by blasting or work carried out in a water environment and from shipping vessels on fish behaviour and mortality when they feed, breed, nurse or migrate.

7.3.2. Marine environment

- the physical effects on the estuarine and marine environment, including changes to water quality, chemical composition, temperature, oceanographic conditions, etc.;
- the effects to the marine environment and to marine organisms, including fish, invertebrates, marine mammals and sea turtles, etc., as a result of an increase in ambient underwater noise levels generated by shipping vessels;
- the effects to the marine environment and to marine organisms, including fish, invertebrates, marine mammals, marine birds and sea turtles, etc., as a result of potential vessel strikes;
- the effects to the use of the marine environment, including estuarine, floodplain and marine habitats by fish, invertebrates and marine mammals with regard to their life cycles (e.g. migration, spawning, emergence);
- any effects resulting from overlapping periods between construction periods and key fisheries (e.g. commercial lobster fishery and Indigenous lobster fishery) windows for marine species;

- any other effects to marine organisms, including marine fish, marine mammals, marine birds, sea turtles, benthic organisms, etc.

7.3.3. Marine plants

- marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton, and eelgrass.

7.3.4. Migratory birds

- direct and indirect adverse effects on migratory birds, including population level effects that could be caused by all project activities, including but not limited to:
  - site preparation;
  - deposit of harmful substances in waters that are frequented by migratory birds (e.g. water management facilities)**;** and
- risk of collision of migratory birds with any project infrastructure and shipping vessels; and
- indirect effects caused by increased disturbance (e.g. noise, light, presence of workers), relative abundance movements, and losses or changes in migratory bird habitat, considering the critical breeding and migration periods for the birds.

7.3.5. Species at risk

- the potential adverse effects of the project on species at risk listed under the Species at Risk Act, including the leatherback sea turtle and North Atlantic right whale, and, where appropriate, its critical habitat or proposed critical habitat; i.e. direct and indirect effects on the survival or recovery of species listed under the Species at Risk Act.
- the potential adverse effects of the project on species listed by the Committee on the Status of Endangered Wildlife in Canada classified as extirpated, endangered, threatened or of special concern (flora and fauna) and their critical habitat.

7.3.6. Indigenous peoples

With respect to Indigenous peoples, provide a description and analysis, for each Indigenous group, of how changes to the environment caused by the project will affect the health and socio-economic conditions, physical and cultural heritage including any structure, site or thing of historical, archaeological or paleontological importance, and current use of lands and resources for traditional purposes.

Health and Socio-Economic Conditions

Baseline information gathered as part of the assessment of effects described in 5(1)(c) of CEAA 2012, as well as general information about Indigenous populations and sub-populations could inform the assessment of human health.

- The assessment of impacts to human health will be based on effects of changes to the environment on Indigenous peoples' human health, focusing on effects on health outcomes or risks in consideration of, but not limited to, potential changes in air quality, noise exposure and effects of vibration from blasting, current and future availability of country foods, and water quality (drinking, recreational and cultural uses).
- When risks to human health due to changes in one or more of these components are predicted, the proponent is expected to complete a Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern to adequately characterize potential risks to human health.
- The proponent must provide a justification if it determines that an assessment of the potential for contamination of country foods (or other exposure pathways, such as inhalation) is not required or if some contaminants are excluded from the assessment.
- Consider effects to mental and social well-being of Indigenous peoples. Where adverse health effects are predicted, any incidental effects such as effects on current use of lands and resources for traditional purposes should also be assessed.
- Consider and document how effects of changes to the environment could be different for particular sub-populations within an Indigenous group (for example, women, youth, elders, specific families).
- This assessment of impacts to human health will assess effects of changes to the environment on Indigenous peoples' socio-economic conditions, including, but not limited to:
    - the use of navigable waters (including any water used for Indigenous transport)
    - forestry and logging operations
    - commercial fishing, hunting, trapping, and gathering activities
    - commercial outfitters
    - recreational use
    - food security[16]
    - income inequity
    - changes at the community level that affect socio-economic conditions for Indigenous peoples as result of increased population, economic activity, cost of living, among other factors
    - non-commercial / trade economy

Physical and Cultural Heritage

- This assessment will assess effects of changes to the environment on Indigenous peoples' physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance to groups, including, but not limited to:
    - the loss or destruction of physical and cultural heritage
    - changes to access to physical and cultural heritage
    - changes to the cultural value or importance associated with physical and cultural heritage
    - changes to sacred, ceremonial or culturally important places, objects, or things

[16] According to Health Canada and the Food and Agricultural Organisation "food security" is "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".

- changes to visual aesthetics over the life of the project

Current Use of Lands and Resources for Traditional Purposes

- This assessment will characterize the effects (including cumulative effects) on the use or activity (e.g. hunting, fishing, trapping, plant gathering, and cultural practices) as a result of the underlying changes to the environment (i.e. how will the activity change if the project proceeds), using the approach described in the Agency's guide entitled *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA 2012*.[17] This assessment should consider changes caused by the project through changes to the environment, can cause effects to the practice of a current use or activity through the following interactions with:
  - Resources used, such as changes to the quantity, quality, and availability of resources and habitat, as well as to the sufficiency of resources required to conduct an activity or practice, including perception of effects, avoidance, and consideration of the seasonal round;
  - Access to areas and resources without difficulty or additional cost used to conduct an activity or practice, as well as the opening up of areas to non-Indigenous populations for access and use, and consideration of preferred areas, timing of harvest, and options of traveling there in preferred manner; and
  - Experience by Indigenous peoples, including changes that affect the spiritual and cultural experiences of the activity or practice, as well as sense of place and wellbeing, and the applicability and transmission of Indigenous knowledge, laws, customs and traditions.
- Using the interactions listed in the above bullet, the proponent should also consider the following in their assessments:
  - the cultural value or importance associated with traditional uses or areas affected by the project (e.g. values or attributes of the area that make it important as a place for inter-generational teaching of language or traditional practices, communal gatherings, integrity of preferred traditional practice areas);
  - how timing of project activities (e.g. construction, discharges) have the potential to interact with the timing of traditional practices, and any potential effects resulting from overlapping periods;
  - how environmental effects to lands and resources could affect the use and associated activities;
  - consideration of the regional context for traditional use, and the value of the project area in that regional context, including alienation of lands from traditional use; and
  - an assessment of the potential to return affected areas to pre-project conditions to support traditional practices (including the identification of end land use goals).
- Other effects of changes to the environment on groups should be reflected as necessary.

The proponent is expected to provide mitigation measures for effects of changes to the environment on Indigenous peoples pursuant to section 5 (1)(c) of CEAA, 2012 (see Part 2, Section 7.4 of these guidelines).

[17] The proponent should refer to the Agency's guidance documents related to current use of lands and resources for traditional purposes.

7.3.7. Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, within another province or outside Canada

Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands (waters), lands in another province or lands outside of Canada, the EIS will include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines). For example, if an authorization provided under the *Fisheries Act* was to result in the flooding of key wildlife habitat (e.g. eelgrass beds), baseline information should be provided on the wildlife species likely to be affected.

Human environment:

- the rural and urban settings likely to be affected by the project;
- any federal lands (waters), lands located outside the province or Canada that may be affected by the project;
- the current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters, including:
    - seasonality of these activities;
    - commercial and recreational and Indigenous fisheries statistics (e.g. species, annual catch and number of licences);
    - maps of fishing areas in the project area and descriptions of their relative importance in a broader regional context (e.g. representation percentage of regional landings or economic value); and
    - an inventory, description (including maps) and evaluation of any archaeological, cultural and historical resources, sites or practices that may be affected by the marine shipping associated with the project;
- current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available;
- a description of the types of vessels currently operating in the region, particularly those likely to be encountered by vessels associated with the project. Variations in traffic density statistics, types cargo, and ports of origin and destination should also be described;
- location of and proximity of any permanent, seasonal or temporary residences or camps;
- health[18] and socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities;
- physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

[18] The proponent should refer to Health Canada's guidance documents in order to include the appropriate baseline information relevant to human health.

7.4. Mitigation measures

Every EA conducted under CEAA 2012 will consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. Under CEAA 2012, mitigation measures includes measures to eliminate, reduce or control the adverse environmental effects of a designated project, as well as restitution for damage to the environment through replacement, restoration, compensation or other means. Measures will be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation. Mitigation measures may be considered for inclusion as conditions in the EA decision statement and/or in other compliance and enforcement mechanisms provided by other authorities' permitting or licensing processes.

As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the project or relocation of project components.

The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The EIS will then describe the project's environmental protection plan and its environmental management system, through which the proponent will deliver this plan. The plan will provide an overall perspective on how potentially adverse effects would be minimized and managed over time. The EIS will further discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs.

The EIS will then describe mitigation measures that are specific to each environmental effect identified. Mitigation measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation measure is designed to address. The EIS will identify and describe mitigation measures to avoid, or lessen potential adverse effects on species and/or critical habitat listed under the *Species at Risk Act*. These measures will be consistent with any applicable recovery strategy and action plans. The EIS will also identify and describe mitigation measures to avoid or lessen adverse effects on listed Committee on the Status of Endangered Wildlife in Canada species.

The EIS will specify the actions, works, minimal disturbance footprint techniques, 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 will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit. The proponent is also encouraged to identify mitigation measures for effects that are adverse although not significant.

The EIS will indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation measures will be justified. The EIS will identify who is responsible for the implementation of these measures and the system of accountability.

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 will be clearly and concisely described. In addition, the EIS will identify the

extent to which technological innovations will help mitigate environmental effects. Where possible, it will provide detailed information on the nature of these measures, their implementation, management and the requirements of the follow-up program.

The EIS will document specific suggestions raise by each Indigenous group for mitigating the effects of changes to the environment on Indigenous peoples (section 5(1)(c) of CEAA 2012*).* For those mitigation measures intended to address effects of changes to the environment on Indigenous peoples, the proponent must discuss the residual effects with the Indigenous groups identified in Part 2, Section 5 of these guidelines prior to submitting the EIS.

Adaptive management is not considered as a mitigation measure, but if the follow-up program (refer to Section 8 below) indicates that corrective action is required, the proposed approach for managing the action should be identified.

7.5. Significance of residual effects

After having established the technically and economically feasible mitigation measures, the EIS will present any residual environmental effects of the project on the VCs identified in Section 6.3 above. For those VCs related to effects of changes to the environment on Indigenous peoples, the proponent must discuss the residual effects with the Indigenous groups identified in Part 2, Section 7 of these guidelines prior to submitting the EIS. The residual effects, even if very small or deemed insignificant, will be described.

The EIS will then provide a detailed analysis of the significance of the residual environmental effects that are considered adverse following the implementation of mitigation measures, using the Agency's guidance on determining whether a project is likely to cause significant adverse environmental effects.

The EIS will identify the criteria used to assign significance ratings to any predicted adverse effects. It will contain clear and sufficient information to enable the Agency or review panel, technical and regulatory agencies, Indigenous groups, and the public to review the proponent's analysis of the significance of effects. For those predicted adverse effects that relate to effects of the changes to the environment on Indigenous peoples, the proponent will consider the views of the Indigenous groups in the determination of the definitions of the significance criteria. The EIS will document the terms used to describe the level of significance.

The following criteria should be used in determining the significance of residual effects:

- magnitude;
- geographic extent;
- timing;
- duration;
- frequency;
- reversibility;

- ecological and social context;[19]
- existence of environmental standards, guidelines or objectives for assessing the effect.

In assessing significance against these criteria the proponent will, where possible, use relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment. The EIS will contain a section which explains the assumptions, definitions and limits to the criteria mentioned above in order to maintain consistency between the effects on each VC.

Where significant adverse effects are identified, the EIS will set out the probability (likelihood) that they will occur, and describe the degree of scientific uncertainty related to the data and methods used within the framework of this environmental analysis.

7.6. Other effects to consider

7.6.1. Effects of potential accidents or malfunctions

The failure of certain works caused by human error or exceptional natural events (e.g. flooding, earthquake, forest fire) could cause major effects. The proponent will therefore conduct a quantitative analysis of the risks of accidents and malfunctions, determine their effects, and present a preliminary emergency response measure.

Taking into account the lifespan of different project components, the proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in section 5 of CEAA 2012), the plausible worst case scenarios and the effects of these scenarios. Fate and behaviour modelling of potential spills of hazardous materials, including hydrocarbons, to waters frequented by fish should be considered for all seasons.

This assessment will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events and would potentially result in an adverse environmental effect as defined in section 5 of CEAA 2012.

The EIS will describe the safeguards that have been established to protect against such occurrences and the contingency and emergency response procedures that would be put in place if such events do occur. The EIS will will identify areas where marine or land-based accident and malfunction scenarios would

[19] The ecological and social context within which potential environmental effects may occur should be taken into account when considering the key criteria above in relation to a particular VC, as the context may help better characterize whether adverse effects are significant.

have the potential to impact VCs, including fish, marine plants and migratory birds (e.g. streams, wetlands).

Accidents or Malfunctions Related to Maritime Transportation

The proponent will describe and evaluate the potential effects to the environment caused by accidents and malfunctions resulting from marine transportation associated with the project, including impacts on social, economic or cultural elements of the environment and on people's health in the vicinity of spill locations.

If serious accidents or malfunctions are likely to occur and if the necessary data are available, the proponent will provide a risk assessment that assesses the probability of such scenarios occurring and the resulting consequences, taking into account contributing and complicating factors such as extreme weather conditions and external events.

The proponent will also assess the potential of minor and major accidental release of fuel, or loss of dangerous goods. If necessary, the proponent will also provide an analysis of the potential environmental effects of these discharges on aquatic and terrestrial receptors and the pathways thereto, including the effects on human health within the spatial boundaries of a plausible worst-case accident scenario at the marine terminal and/or along the vessel transit route. The assessment should be supported by fate and behaviour modelling coupled with hydrologic trajectory modelling for contaminants spilled to water through all seasons of the year, including tidal and current effects, with all accompanying model assumptions and limitations documented.

The proponent will also describe existing emergency preparedness and response systems and existing arrangements with the responsible response organizations in the maritime transportation spatial boundaries associated with the project, including exercise and training plans for spill emergency response. The proponent will describe the role it will play in case of spill, collision, grounding or other accidents or malfunctions related to maritime transportation associated with the project.

7.6.2. Effects of the environment on the project

The EIS will take into account how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g. flooding, drought, ice jams, landslides, avalanches, erosion, subsidence, fire, outflow conditions, and seismic events), could adversely affect the project and how this in turn could result in effects to the environment (e.g. extreme environmental conditions result in/contribute to and/or complicate malfunctions and accidental events). These events will be considered in different probability patterns (e.g. 5-year flood vs. 100-year flood).

The EIS will provide details of planning, design and construction strategies intended to minimize the potential environmental effects of the environment on the project.

7.6.3. Cumulative effects assessment

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative environmental effects.

Cumulative effects are defined as changes to the environment due to the project combined with the existence of other past, present and reasonably foreseeable physical activities, such as an increase in vessel traffic as a result of project activities. Cumulative effects may result if:

- the implementation of the project may cause direct residual adverse effects on the VC, taking into account the application of technically and economically feasible mitigation measures; and
- the same VC may be affected by other past, present and future physical activities.[20]

VCs that would not be affected by the project or would be affected positively by the project can, therefore, be omitted from the cumulative effects assessment. A cumulative effect on an environmental component may, however, be important even if the assessment of the project's effects on this component reveals that the effects of the project are minor.

In its EIS, the proponent will:

- identify and provide a rationale for the VCs that will constitute the focus of the cumulative effects assessment, focussing the cumulative effects assessment on the VCs most likely to be affected by the project and other project and activities. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project:
  - fish and fish habitat, including lobster and other valued fish species;
  - migratory birds;
  - species at risk, including the leatherback sea turtle and North Atlantic right whale;
  - marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae, phytoplankton, and eelgrass;
  - Indigenous peoples; and
  - any VCs associated with subsection 5(2) of CEAA 2012, including the commercial lobster fishery, recreation and tourism.
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments will generally be different for each VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects;
- identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEAA 2012.
- assess the cumulative effects on each VC selected by comparing the future scenario with the project and without the project. Effects of past activities (activities that have been carried out) will be used to contextualize the current state of the VC. In assessing the cumulative effects on current use of lands

[20] Definitions of these terms can be found in the Agency's technical guidance on cumulative environmental effects.

and resources for traditional purposes, the assessment will focus on the cumulative effects on the relevant activity (e.g. hunting, fishing, trapping, plant harvesting).
- describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term.
- determine the significance of the cumulative effects.
- develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.

The proponent is encouraged to consult with key stakeholders and Indigenous groups prior to finalizing the choice of VCs and the appropriate boundaries to assess cumulative effects.

8. Summary of Environmental Effects Assessment

The EIS will contain a table summarizing the following key information:

- potential environmental effects on VCs;
- proposed mitigation measures to address the effects identified above; and
- potential residual effects and the significance of the residual environmental effects.

The summary table will be used in the EA Report prepared by the Agency or will be considered by the review panel. An example of a format for the key summary table is provided in Appendix 1 of this document.

In a second table, the EIS will summarize all key mitigation measures and commitments made by the proponent which will more specifically mitigate any significant adverse effects of the project on VCs (i.e. those measures that are essential to ensure that the project will not result in significant adverse environmental effects).

9. Follow-up and Monitoring Programs

A follow-up program is designed 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. Considerations for developing a follow-up program include:

- whether the project will impact environmentally sensitive areas/VCs or protected areas or areas under consideration for protection;
- the nature of Indigenous and public concerns raised about the project;
- suggestions from Indigenous groups regarding the design of and involvement in follow-up and monitoring programs;
- incorporation of Indigenous knowledge, where available;
- the accuracy of predictions;
- whether there is a question about the effectiveness of mitigation measures or the proponent proposes to use new or unproven techniques and technology;
- the nature of cumulative environmental effects;
- the nature, scale and complexity of the program; and
- whether there was limited scientific knowledge about the effects in the EA.

The goal 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 project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

9.1. Follow-up program

The duration of the follow-up program shall be as long as required to evaluate the effectiveness of the mitigation measures.

The EIS shall present a preliminary follow-up program and shall include:

- objectives of the follow-up program and the VCs targeted by the program;
- list of elements requiring follow-up;
- number of follow-up studies planned as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.);
- intervention mechanism used in the event that an unexpected deterioration of the environment is observed;
- mechanism to disseminate follow-up results among the concerned populations;
- accessibility and sharing of data for the general population;
- opportunity for the proponent to include the participation of Indigenous groups and stakeholders on the affected territory, during the development and implementation of the program; and
- involvement of local and regional organizations in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations and the proponent.

9.2. Monitoring

The proponent will prepare an environmental monitoring program for all phases of the project.

Specifically, the environmental impact statement shall present an outline of the preliminary environmental monitoring program, including the:

- identification of the interventions that pose risks to one or more of the environmental and/or VCs and the measures and means planned to protect the environment;
- identification of regulatory instruments that include a monitoring program requirement for the VCs;
- description of the characteristics of the monitoring program where foreseeable (e.g. location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required);
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts;
- guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned; and
- plans to engage Indigenous groups in monitoring, where appropriate.

9.3. Appendix 1: Example - Summary Table of Environmental Assessment

						Key Criteria for Determining Significance[21]							
Valued Component affected	Area of federal jurisdiction[22] (√)	Project Activity	Potential effects	Proposed mitigation	Residual effect	*Magnitude*	*Geographical Extent*	*Timing*	*Duration*	*Frequency*	*Reversibility*	Significance of residual adverse effect	Likelihood of significance of residual adverse effect
Fish and fish habitat													
Migratory birds													
Species at risk													
Current use of land and resource for traditional purpose	√ 5(1)(c)(iii)												
Any other VCs identified (e.g. commercial, recreational and Indigenous fisheries)													

[21] Other key criteria can be used to determine significance, as appropriate. The ecological and social context within which potential environmental effects may occur should be taken into account when considering the key criteria in relation to a particular VC, as the context may help better characterize whether adverse effects are significant.

[22] Indicate by a check mark which valued components can be considered "environmental effects" as defined in section 5 of CEAA 2012, and specify which subsection of section 5 is relevant. For example, for the VC "current use of lands and resources for traditional purposes", the appropriate cell would indicate, section 5(1)(*c*)(iii) of CEAA 2012.