



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

**pursuant to the
*Canadian Environmental Assessment Act, 2012***

**Saguenay Energy Project
Liquefied Natural Gas Export Terminal
by
GNL Québec**

March 14, 2016

Table of Contents

PART 1 - KEY CONSIDERATIONS.....	1
1 INTRODUCTION.....	1
2 GUIDING PRINCIPLES.....	1
2.1 ENVIRONMENTAL ASSESSMENT AS A PLANNING TOOL	1
2.2 PUBLIC PARTICIPATION	1
2.3 ABORIGINAL ENGAGEMENT	2
2.4 APPLICATION OF THE PRECAUTIONARY APPROACH	2
3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT.....	2
3.1 DESIGNATED PROJECT	2
3.2 FACTORS TO BE CONSIDERED	3
3.2.1 Additional matters relevant to the environmental assessment.....	4
3.3 SCOPE OF FACTORS	5
3.3.1 Changes to the Environment	5
3.3.2 Valued Components to be Examined.....	5
3.3.3 Spatial and Temporal Boundaries	6
4 PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT	6
4.1 GUIDANCE.....	6
4.2 STUDY STRATEGY AND METHODOLOGY	7
4.3 USE OF INFORMATION.....	8
4.3.1 Scientific Advice	8
4.3.2 Community Knowledge and Aboriginal Traditional Knowledge	9
4.3.3 Existing Information.....	9
4.3.4 Confidential Information.....	9
4.4 PRESENTATION AND ORGANIZATION OF THE ENVIRONMENTAL IMPACT STATEMENT	9
4.5 SUMMARY OF THE ENVIRONMENTAL IMPACT STATEMENT	10
PART 2 – CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT	12
1 INTRODUCTION AND OVERVIEW.....	12
1.1 THE PROPONENT	12
1.2 PROJECT OVERVIEW	12
1.3 PROJECT LOCATION	12
1.4 REGULATORY FRAMEWORK AND THE ROLE OF GOVERNMENT.....	12
2 PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED	13
2.1 PURPOSE OF THE PROJECT.....	13
2.2 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT	13
3 PROJECT DESCRIPTION	14
3.1 PROJECT COMPONENTS.....	14
3.2 PROJECT ACTIVITIES.....	15
4 PUBLIC CONSULTATION AND CONCERNS.....	17
5 ABORIGINAL ENGAGEMENT AND CONCERNS.....	17
5.1 ABORIGINAL GROUPS TO ENGAGE & ENGAGEMENT ACTIVITIES	19
6 EFFECTS ASSESSMENT	20
6.1 PROJECT SETTING AND BASELINE CONDITIONS	20
6.1.1 Air Quality, Noise Environment and Climate.....	20

6.1.2	Geology and Surface Deposit	21
6.1.3	Hydrographic Network and Saguenay River Characteristics	21
6.1.4	Riparian, Wetland and Terrestrial Environments	22
6.1.5	Fish and Fish Habitat	22
6.1.6	Marine Plants (other aquatic species)	23
6.1.7	Birds and their Habitats	23
6.1.8	Species at Risk and Special Status Species	23
6.1.9	Aboriginal Peoples	24
6.1.10	Human Environment (Other than Aboriginal)	25
6.2	PREDICTED CHANGES TO THE PHYSICAL ENVIRONMENT	25
6.2.1	Changes to the Atmospheric Environment	26
6.2.2	Changes to Watercourses and the Saguenay River	27
6.2.3	Changes to Riparian, Wetland and Terrestrial Environments	27
6.3	PREDICTED EFFECTS ON VALUED COMPONENTS	28
6.3.1	Fish and Fish Habitat	28
6.3.2	Marine Plants	28
6.3.3	Birds and their Habitats	29
6.3.4	Aboriginal Peoples	29
6.3.5	Changes to the environment that would occur on federal or transboundary lands or related to the exercise of a federal duty (permit, authorization)	30
6.4	MITIGATION	31
6.5	SIGNIFICANCE OF RESIDUAL EFFECTS	32
6.6	OTHER EFFECTS TO CONSIDER	32
6.6.1	Effects of the Environment on the Project	32
6.6.2	Effects of Potential Accidents or Malfunctions	33
6.6.3	Cumulative Effects Assessment	33
7	SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT	35
8	MONITORING AND FOLLOW-UP PROGRAMS	35
8.1	MONITORING	35
8.2	FOLLOW-UP PROGRAM	36
9	MARINE SHIPPING	36
9.1	VALUED COMPONENTS	36
9.2	SPATIAL BOUNDARIES	37
9.3	TEMPORAL BOUNDARIES	37
9.4	DESCRIPTION OF MARINE SHIPPING ASSOCIATED WITH THE PROJECT	37
9.4.1	Marine Shipping Overview	37
9.4.2	Description of Activity	37
9.5	BASELINE CONDITIONS	37
9.5.1	Existing Marine Environment	37
9.5.2	Existing Human Environment	38
9.6	EFFECTS ASSESSMENT AND MITIGATION MEASURES	38

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* or its regulations. In the event of a discrepancy, the *Canadian Environmental Assessment Act, 2012* and its regulations prevail. Portions of the *Canadian Environmental Assessment Act, 2012* have been paraphrased in this document, but will not be relied upon for legal purposes.

Part 1 - Key Considerations

1 INTRODUCTION

The purpose of this document is to identify for the proponent the information requirements for the preparation of an Environmental Impact Statement for a designated project¹ to be assessed pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). This document specifies the nature, scope and extent of the information required. Part 1 of this document defines the scope of the environmental assessment and provides guidance and general instruction on the preparation of the Environmental Impact Statement. Part 2 outlines the information that must be included in the Environmental Impact Statement.

CEAA 2012 requires an assessment of the potential effects of a proposed project as identified in section 5 of CEAA 2012. The Canadian Environmental Assessment Agency (the Agency) will use the proponent's environmental impact statement and other information received during the environmental assessment process to prepare an environmental assessment Report that will inform the issuance of a decision statement by the Minister of the Environment. Therefore, the environmental impact statement 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. 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.

The environmental assessment highlights the key issues associated with the project. It is important that it show the evolution of the identified issues throughout the analysis based on the choice of alternatives and the mitigation measures put in place.

2 GUIDING PRINCIPLES

2.1 Environmental Assessment as a Planning Tool

An environmental assessment is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate possible environmental effects and to encourage decision makers to take actions that promote sustainable development (par. 4(1)(h) of CEAA 2012). The environmental impact statement must show that sustainable development objectives have been incorporated into the project. Sustainable development seeks to meet the needs of the present without compromising the ability of future generations to meet theirs. The three objectives of sustainable development are continued integrity of the environment, improvement of social equity, and improvement of economic efficiency. During planning and analysis of a project, the aim must be to balance these three objectives. The environmental impact statement must summarize the proponent's approach to sustainable development and explain how it has been incorporated into the project's design.

2.2 Public Participation

One of the purposes identified in CEAA 2012 is to ensure opportunities for meaningful public participation during an environmental assessment. CEAA 2012 requires that the Agency provide the public with an opportunity to participate in the environmental assessment and an opportunity to comment on the draft environmental

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

assessment report. 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 (par. 4(1)(h) of the Act). The Environmental Impact Statement must show that sustainable development objectives have been incorporated into the project. Sustainable development seeks to meet the needs of the present without compromising the ability of future generations to meet theirs. The three objectives of sustainable development are continued integrity of the environment, improvement of social equity, and improvement of economic efficiency. During planning and analysis of a project, the aim must be to balance these three objectives. The Environmental Impact Statement must summarize the proponent's approach to sustainable development and explain how it has been incorporated into the project's design.

2.3 Aboriginal Engagement

A key objective of CEAA 2012 is to promote communication and cooperation with Aboriginal peoples which includes, First Nations, Inuit and Métis. The proponent is expected to engage with Aboriginal groups that may be affected by the project, as early as possible in the project planning process. The proponent will provide Aboriginal groups with opportunities to learn about the project and its potential effects, make their concerns known about the project's potential effects and discuss measures to mitigate those effects. The proponent is strongly encouraged to work with Aboriginal groups in establishing an engagement approach. The proponent will make reasonable efforts to integrate traditional Aboriginal knowledge into the assessment of environmental impacts.

Information gathered through the environmental assessment process and associated engagement by the proponent with Aboriginal groups will be used to inform decisions under CEAA 2012. In providing information to the Agency, the proponent will respect any confidentiality commitments made to Aboriginal groups (see Part 1, section 4.3.2 for further information on this subject). This information will also contribute to the Crown's understanding of any potential adverse impacts of the project on potential or established Aboriginal or Treaty rights and the effectiveness of measures proposed to avoid or minimise those impacts.

For more information on how Aboriginal traditional knowledge can aid in the preparation of the environmental impact statement, please refer to the Agency's reference guide entitled "Considering Aboriginal traditional knowledge in environmental assessments conducted under CEAA 2012".

2.4 Application of the Precautionary Approach

In documenting the analyses included in the environmental impact statement, 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 November 10, 2015, GNL Québec Inc. (GNL Québec), the proponent of the Saguenay Energy Project, submitted a description of its liquefied natural gas (LNG) export terminal project to the Agency. Based on this description, the Agency has determined that an environmental assessment is required under CEAA 2012 and will include the construction, operation, decommissioning and closure of the following components:

- processing facilities for liquefying natural gas, including flare stacks, and the connection with the natural gas supply lateral line;

- three LNG storage tanks each with a maximum capacity of 200,000 m³, for a maximum total capacity of 480,000 m³;
- any other chemical and petroleum product storage tanks (e.g., tanks to supply one or more generators, refueling of machinery, trucks, etc.);
- port infrastructures for berthing tank ships and loading LNG, including a pier, a platform and a wharf for berthing LNG tank ships, as well as the mooring and berthing dolphins;
- water supply system to provide ships with drinking water and for fire protection;
- electrical infrastructure required for port operations and to service ships;
- manoeuvring areas, navigation channel and anchoring areas for the sea terminal;
- ship manoeuvring areas, the approach channel, tugboat berths waiting areas, and anchoring areas;
- dredging associated with the construction of the wharf, vessel berthing and maintenance, if necessary;
- sediment disposal site(s) in the aquatic environment or on-land sites (if necessary);
- access roads to the terminal and to the natural gas liquefaction facility;
- natural gas transshipment, storage and natural gas handling areas;
- temporary facilities needed for the construction of the project (wharf, embankment, etc.);
- explosives manufacturing and storage facilities;
- marine transportation in Saguenay Port Authority waters, including approach and berthing manoeuvres, tugboat use, etc.;
- management of waste, cargo residues, ballast water and hazardous materials;
- management of runoff, drinking water and wastewater;
- waste snow management;
- stripping of the shoreline, backfilling in aquatic or terrestrial environments, management of cut and fill material;
- potential rail interconnection from the existing railway for the delivery of coolants or for shipping certain by-products of LNG processing;
- main area, including the administrative and technical buildings and the electrical substation;

The construction of a new gas pipeline roughly 650 kilometres long to transport natural gas from Western Canada using existing pipelines to the project site is excluded from the project's scope because it will be carried out by a third party and should undergo an assessment by the National Energy Board. The construction of a power line roughly 40 kilometres long from an existing Hydro-Québec station to the project site is also excluded from the project's scope because it will be carried out and operated by Hydro-Québec. The construction of a wharf for the tugboats and modification to the material unloading dock are not included in the scope of the Project. Should their construction be required, it will be under the responsibility of other proponents. However, the cumulative environmental effects of the marine terminal project along with these other projects must be assessed based on the guidelines specified in section 6.6.3 (Part 2).

3.2 Factors to be Considered

Scoping establishes the parameters of the environmental assessment and focuses the assessment on relevant issues and concerns. Part 2 of this document specifies the factors to be considered in this environmental assessment, 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 effects;
- 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 alternatives;
- any change to the project that may be caused by the environment; and
- the results of any relevant regional study pursuant to CEEA 2012.

3.2.1 Additional matters relevant to the environmental assessment.

Pursuant to paragraph 19(1)(j) of CEEA 2012, the Agency, has identified the marine shipping associated with the Project, outside of Saguenay Port Authority waters, as an additional matter relevant to the environmental assessment that must be taken into account.

Given that LNG tank ships approaching and departing the terminal will cross the Beluga's critical habitat, the Saguenay–St. Lawrence Marine Park, the Nitassinan of the Innu First Nation of Essipit and the shared territory (southwestern portion) of the Innu First Nations of Essipit, Pekuakamiulnuatsh Takuhikan and Pessamit, the environmental assessment must include the environmental effects of marine shipping associated with the Project on these areas, including the environmental effects of malfunctions or accidents and any cumulative environmental effects, the significance of those effects, suggested mitigation measures and the possible requirements of any follow-up program that may be required.

The proponent will also provide an estimate of upstream greenhouse gas emissions (GHG) that are linked to the project (production, treatment and transportation). This information should be presented by individual pollutant and should be summarized in kilotonnes of CO₂ equivalent per year (Part 2, Section 6.2.1).

Environmental Assessment Decision

The Minister's decision under CEEA 2012 on whether the Project is likely to cause significant adverse environmental effects, and any conditions to the proponent, should the Project be allowed to proceed, will be based on environmental effects that are caused by the Project.

Marine shipping associated with the Project that is beyond the care and control of GNL Québec and production of upstream GHGs are not considered to be part of the Project for the purposes of the environmental assessment. As a result, the Minister will not make a decision under CEEA 2012 about whether that marine shipping associated with the Project or the production of upstream GHGs that are likely to cause significant adverse environmental effects, and it will not be subject to conditions issued to the proponent in any decision statement allowing the Project to proceed. However, those activities are within the jurisdiction of the federal government. The environmental assessment will act as a means for the federal government to collect information on the effects of those activities associated with the Project for use by programs or activities within federal jurisdiction.

3.3 Scope of Factors

3.3.1 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 environmental impact statement.

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 be reasonably be expected to occur.

3.3.2 Valued Components to be Examined

Valued components 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 environmental impact statement will identify the valued components linked to section 5 of CEAA 2012, including the ones identified in Part 2 (section 6.2) of this document 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, in another province or outside Canada;
- with respect to Aboriginal peoples, an effect of any change caused to the environment on:
 - health and socio-economic conditions;
 - physical and cultural heritage;
 - the current use of lands and resources for traditional purposes;
 - 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 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 function;
 - the effect of that change, other than the ones mentioned above, on:
 - health and socio-economic conditions;
 - physical and cultural heritage; and
 - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The final list of valued components to be presented in the environmental impact statement will be completed according to the evolution and design of the project and will reflect the knowledge acquired on the environment through public consultation and Aboriginal engagement. The environmental impact statement will describe what methods were used to predict and assess the adverse environmental effects of the project on these components.

The valued components 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 environmental impact statement will provide a rationale for selecting specific valued components and for excluding any valued components 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 make each determination. Examples of justification include primary data collection, computer modelling, literature references, public consultation, expert input or professional judgement. The environmental impact statement will identify those valued components, 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 environmental impact statement will indicate to whom these concerns are important and the reasons why, including environmental, Aboriginal, social, economic, recreational, and aesthetic considerations. If comments are received on a component that has not been included as a valued component, these comments will be summarised.

3.3.3 Spatial and Temporal Boundaries

The spatial and temporal boundaries used in the environmental assessment may vary depending on the valued component. The proponent is encouraged to consult with the Agency, federal and provincial government departments and agencies, local government and Aboriginal groups, and take into account public comments when defining the spatial boundaries used in the environmental impact statement.

The environmental impact statement will describe the spatial boundaries 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 and Aboriginal traditional knowledge, current land and resource use by Aboriginal groups, as well as ecological, technical, social and cultural considerations.

The temporal boundaries of the environmental assessment will span all phases of the project determined to be within the scope of this environmental assessment as specified under section 3.1 above. Community and Aboriginal traditional knowledge should factor into decisions around temporal boundaries.

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

4 PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1 Guidance

The proponent is encouraged to consult relevant Agency policy and guidance² on topics to be addressed in the environmental impact statement, and with the Agency during the planning and development of the environmental impact statement.

During its planning of the project and the development of the impact statement and technical support documentation, the proponent is also encouraged to consult Environment Canada's document "Guidance for the

²Visit the Canadian Environmental Assessment Agency website: www.ceaa-acee.gc.ca/default.asp?lang=En&n=F1F30EEF-1

Preparation of an Environmental Impact Statement and Useful References” (2016), which is available from that department, and Health Canada’s document “Useful Information for Environmental Assessments”³.

Submission of regulatory and technical information necessary for federal authorities to make their regulatory decisions during the conduct of the environmental assessment is at the discretion of the proponent. Although that information is not necessary for the environmental assessment decision, the proponent is encouraged to submit it concurrent with the environmental impact statement.

4.2 Study Strategy and Methodology

The proponent is expected to respect the intent of these guidelines and to consider the effects that are likely to result 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 environmental impact statement 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 environmental impact statement, the proponent will clearly indicate it, and provide a justification so the Agency, federal authorities, Aboriginal groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency 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 valued components;
- identifying technically and economically feasible mitigation measures for any significant adverse environmental effects;
- determining any residual environmental effects; and
- determining the potential significance of any residual environmental effect following the implementation of mitigation.

For each valued component, the environmental impact statement will describe the methodology used to assess project-related effects. The environmental impact statement will document how scientific, engineering, traditional and local 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 and sensitivity of models used to reach conclusions must be indicated.

The environmental impact statement 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 traditional knowledge, the environmental impact statement will contain a balanced presentation of the issues and a statement of the proponent’s conclusions.

³ See Health Canada website: http://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf

The environmental impact statement 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. This 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 environmental impact statement or may be integrated into clearly defined sections within the effects assessment of each valued component. This analysis will include environmental conditions resulting from historical and present activities in the local and regional study area.

In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent will consider the resilience of relevant species populations, communities and their habitats.

In describing and assessing effects related to Aboriginal peoples, 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 or current use of lands and resources for traditional purposes. Primary sources of information include traditional land use studies, information obtained directly from Aboriginal groups, socio-economic studies, heritage surveys or other relevant studies conducted specifically for the project and its environmental impact statement. 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 Aboriginal groups the opportunity to review and provide comments on the information used for describing and assessing effects on Aboriginal peoples (further information on engaging with Aboriginal groups is provided in Part 2, Section 5 of this document). Where there are discrepancies in the views of the proponent and Aboriginal groups on the information to be used in the environmental impact statement, the environmental impact statement will document these discrepancies and the rationale for the proponent's selection of information.

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 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 environmental impact statement will document the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.

4.3 Use of Information

4.3.1 Scientific 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 environmental assessment make that information or knowledge available to

the Agency. The Agency will advise the proponent of the availability of any pertinent information or knowledge so that it can be incorporated into the environmental impact statement, along with, as appropriate, expert and specialist knowledge provided by other levels of government.

4.3.2 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 community or an Aboriginal community, through generations of living in close contact with nature.

The proponent will incorporate into the environmental impact statement the community and Aboriginal traditional knowledge to which it has access or that is acquired through Aboriginal and public engagement activities, in keeping with appropriate ethical standards and obligations of confidentiality. Agreement should be obtained from Aboriginal groups regarding the use, management and protection of their existing traditional knowledge information during and after the environmental assessment.

4.3.3 Existing Information

In preparing the environmental impact statement, the proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet requirements of the environmental impact statement guidelines, the proponent will either include the information directly in the environmental impact statement 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.

4.3.4 Confidential Information

In implementing CEAA 2012, the Agency is committed to promoting public participation in the environmental assessment of projects and providing access to the information on which environmental assessments are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the environmental assessment are included in the Canadian Environmental Assessment Registry and made available to the public on request. For this reason, the environmental impact statement 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 harm to a person or 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.

4.4 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 environmental impact statement 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;
- the date.

The environmental impact statement will be written in clear, precise language. A glossary defining technical words, acronyms and abbreviations will be included. It 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 environmental impact statement may make reference to the information that has already been presented in other sections of the document, rather than repeating it. The exception to this preference is the cumulative effects assessment, which should be provided in a stand-alone section. 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 environmental impact statement will explain how information is organized in the document. This will include 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 environmental impact statement with the information requirements identified in the environmental impact statement Guidelines, will be provided. The proponent will provide copies of the environmental impact statement 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 environmental impact statement in both of Canada's official languages (French and English) to be provided to the Agency at the same time as the environmental impact statement and which will include the following:

- a concise description of all key components of the project and related activities;
- a summary of the consultation conducted with Aboriginal groups, 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 and proposed technically and economically feasible mitigation measures; and
- the proponent's conclusions on the residual environmental effects of the project after taking mitigation measures into account and the significance of those effects.

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

1. Introduction and environmental assessment context
2. Project overview
3. Alternative means of carrying out the project
4. Public consultation
5. Aboriginal engagement
6. Summary of environmental effects assessment for each valued components, including:
 - a. description of the baseline

- b. anticipated changes to the environment
- c. anticipated effects
- d. mitigation measures
- e. significance of residual effects

7. Monitoring and follow-up programs proposed

The summary will have sufficient details for the reader to learn and understand the project, potential environmental effects, 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 environmental impact statement, the proponent will:

- provide contact information (e.g. name, address, phone, fax, email);
- identify itself and the name of the legal entity 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 environmental impact statement.

1.2 Project Overview

The environmental impact statement 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 a part of a larger sequence of projects, the environmental impact statement 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 (Part 2) of this document.

1.3 Project Location

The environmental impact statement 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 setting 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) 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, in particular the Saguenay–St. Lawrence Marine Park, ecological reserves, wetlands, estuaries, and habitats of federally or provincially listed species at risk or of special status and other sensitive areas;
- local and Aboriginal communities; and
- traditional Aboriginal territories, treaty lands, Indian reserve lands.

1.4 Regulatory Framework and the Role of Government

The environmental impact statement 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;
- the environmental and other regulatory approvals and legislation that are applicable to the project at the federal, provincial, regional and municipal levels;
- the differences in scope between the provincial and federal environmental assessments for this project and provide a correlation table indicating the points in the impact study that deal with special provincial requirements;
- government policies, resource management, planning or study initiatives pertinent to the project and/or environmental assessment and their implications;
- whether a request has been or will be submitted to Transport Canada’s Marine Safety Directorate for implementation of the TERMPOL⁴ review process;
- any treaty or self-government agreements with Aboriginal groups that are pertinent to the project and/or environmental assessment;
- any relevant land use plans, land zoning, or community plans; 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 environmental impact statement 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 and the positive impacts of the project from the perspective of the proponent. If the objectives of the project are related to, to broader private or public sector policies, plans or programs, this information will also be included.

The description of the background and rationale for the project must clearly set out the environmental, social and economic issues on the local, regional, national and international scales. This description will be considered in assessing the justifiability of the project from the perspective of sustainable development, taking into account the current situation in the economic sector concerned.

The environmental impact statement will also describe the predicted environmental, economic and social benefits of the project. This information will be considered in assessing the justifiability of any significant adverse residual environmental effects, if such effects are identified.

2.2 Alternative Means of Carrying out the Project

The environmental impact statement will identify and consider the effects of alternative means of carrying out the project that are technically and economically feasible. The proponent will complete the following procedural steps for addressing alternative means:

- identify the alternative means to carry out the project;
- identify the effects of each technically and economically feasible alternative means;

⁴ TERMPOL: Technical Review Process of Marine Terminal Systems and Transshipment Sites

- select the approach for the analysis of alternative means (i.e., identify a preferred means or bring forward alternative means);
- assess the environmental effects of the alternative means.

In its alternative means analysis, the proponent will address, at a minimum, the following project components:

- the natural gas liquefaction process;
- the location of the terminal, approach channel and anchoring areas;
- the construction of marine infrastructure (jetty, platform, wharfs, dolphins): type of structure, location, orientation, configuration and construction;
- systems for LNG transportation and ship loading;
- dredging methods, if applicable;
- sediment management and sediment disposal sites, providing the reasoning for the selection of the disposal site, if applicable.

The proponent shall consider, without limiting itself there to, the following criteria:

- dredging or backfilling must not be carried out in aquatic environments unless absolutely necessary, and it must be kept to a minimum in terms of surface area and volume;
- the sedimentation rate must be kept to a minimum in order to reduce the frequency and scale of maintenance dredging;
- contaminated sediment management must comply with the *Criteria for Evaluating Sediment Quality in Quebec and Application Frameworks: Prevention, Dredging and Remediation*;
- in the analysis of management options for dredged sediments, preference must be given to beneficial use of dredged sediment (wildlife management, fertilizing residual materials, etc.);
- soil and sediment management in terrestrial environment on non-federal lands must comply with Quebec's *Soil Protection and Contaminated Sites Rehabilitation Policy*;
- emissions of air pollutants and emissions of greenhouse gases must be reduced to a minimum.

For further information regarding the “purpose of” and “alternative means”, please consult the Agency's Operational Policy Statement entitled Addressing “Purpose of” and “Alternative Means” under CEAA 2012.

The Agency recognizes that projects may be in the early planning stages when the environmental impact statement is being prepared. Where proponents have 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, they are strongly encouraged to conduct an environmental effects analysis at the same level of detail assessment of the various options available (alternative means) within the environmental impact statement.

3 PROJECT DESCRIPTION

3.1 Project Components

The environmental impact statement will describe the project, by presenting the project components, associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. This will include:

- natural gas liquefaction facilities up to the connection point with the natural gas carrier pipe, including natural gas receiving and processing equipment, liquefaction circuits, LNG and coolant storage tanks,

flare stacks, generators, gas delivery pipelines and fume return lines and emergency and leak detection systems;

- marine infrastructures, including a jetty, a platform, a wharf for berthing LNG tanker ships, as well as mooring and berthing dolphins and interconnected walkways that may be installed between the platform, the jetty and the dolphins, specifying their area, size and location, as well as their orientation in relation to existing terminals;
- ships and tugboats manoeuvring areas, approach channel, anchorage areas;
- permanent and temporary works related to dredging (including maintenance dredging) as well as open-water or terrestrial disposal sites or dewatering basins, if required, indicating the size, location, type, volume and the level of contamination of sediments to be stored, as the case may be;
- terrestrial access roads at the site of the terminal, including their surface area, size, location, and orientation with respect to the wharf to be built;
- natural gas transshipment, storage and handling areas, including service and secondary electrical-power infrastructure and working surfaces;
- petroleum products storage tanks intended for the operation of machinery, compressors, generators, trucks, locomotives, ships or other (if any);
- permanent and temporary linear infrastructure (including conduits, power lines, connection to the existing railway, etc.), indicating the route of these infrastructure and their location;
- temporary structures required for project construction;
- explosives manufacturing and storage facilities;
- works for managing water, waste, cargo residues and hazardous materials;
- support infrastructure and buildings, including electrical substation.

The Environmental Impact Statement shall include maps and bathymetric data of the project site, at an appropriate scale. The maps shall show the location of the sediment disposal sites, indicate the surface area (land and water) required for the project and identify the owners. 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.

3.2 Project Activities

This will include descriptions of the activities to be carried out during each phase (construction, operation, maintenance and decommissioning), 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 public concerns identified. Highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment.

The environmental impact statement 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, Aboriginal peoples, and the public.

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

It should also include a description of the following elements:

- the activities involved in preparing the site for construction of the port terminal and the other project components: site clearing, scouring, excavation, blasting (if required), backfilling (area, volume, characteristics, origin and transport of materials, temporary storage), any required diversion of water flows, construction of outer retaining dikes or cofferdams, grading, drilling, densification, preloading, compaction of soil and temporary road construction;
- construction methods used to build the terminal (including concreting, filling and ground densification, installation of riprap, pile and sheet-pile driving);
- explosives manufacturing and storage;
- dredging activities for the construction of the marine infrastructure (wharfs, jetty, platform, dolphins) specifying the location, depth, surface area, volume and nature of the sediment to be dredged (i.e. physical and chemical characteristics)⁵, dredging methods (e.g. equipment used, duration and frequency), management of anticipated dispersion plume of sediment that could be resuspended during dredging or open-water disposal (if applicable), mitigation measures to prevent sediment resuspension, sediment management plans (open-water or terrestrial disposal) and sediment transportation modes to the construction or disposal sites, including management of dewatering basins, if necessary;
- open-water disposal activities of dredged sediments, if applicable, indicating the rationale for the choice of the site and specifying the land area used, particle size distribution and the nature of sediments (physical and chemical characteristics);
- construction methods and dimensions of anchorage areas at the terminal and in the navigation channel, if applicable;
- liquefied natural gas manufacturing;
- shipping activities (including approach and berthing manoeuvres, anchoring and tugboat use), specifying the number, frequency, type, size, speed of travel, vessel tonnages and capacities, marine terminal operating schedule and the increase over current traffic, as well as ice-breaking (time of year, frequency, duration, planned start and end dates), and ballast water management, including invasive species management plans);
- activities related to refueling of ships;
- operations related to the transshipment, storage and handling of goods, petroleum products (if applicable), hazardous materials and LNG;
- water management, including the profiling of ditches and ponds, the construction of one or more water wells and stormwater, process water and wastewater treatment and evacuation systems;
- 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, including maintenance dredging operations (surface area, volume and frequency based on the sediment balance of the water body, dredged sediment management and methods);
- management of waste, cargo residues and hazardous materials;

⁵ The Agency recommends that the proponent submits its sediment sampling plan to Environment and Climate Change Canada.

- waste snow management
- contribution to atmospheric emissions, including emissions profile (type, rate and source) for construction and operation phases;

4 PUBLIC CONSULTATION AND CONCERNS

The environmental impact statement will describe the ongoing and proposed consultations and the information sessions that the proponent will hold or that it has already held 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 environmental impact statement 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 environmental impact statement. The environmental impact statement will provide a summary of key issues raised related to the environmental assessment as well as describe any outstanding issues and ways to address them.

5 ABORIGINAL ENGAGEMENT AND CONCERNS

For the purposes of developing the EIS, the proponent will engage with Aboriginal groups that may be affected by the project, to obtain their views on:

- Effects of changes to the environment on Aboriginal 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 CEEA 2012, and
- Potential adverse impacts of the project on potential or established Aboriginal or treaty rights, title and related interests, in respect of the Crown's duty to consult, and where appropriate, accommodate Aboriginal peoples.

With respect to the effects of changes to the environment on Aboriginal peoples, the assessment requirements are outlined in Part 2, sections 6.1.9 and 6.3.6 of these Guidelines. With respect to potential adverse impacts of the project on potential or established Aboriginal or treaty rights, title and related interests, the EIS will document for each group identified in section 5.1 of these Guidelines (or in subsequent correspondence from the Agency):

- Potential or established Aboriginal or treaty rights⁶, title and related interests, when this information is directly provided by a group to the proponent, the Agency or is available through public records including:
 - Geographical extent, nature, frequency and timing of the practice or exercise of the right; and,
 - 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 potential or established Aboriginal or treaty rights, title and related interests. This assessment is to be based on a comparison of the exercise of the identified rights, title and related interests between the

⁶ The 2011 *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* (the Guidelines) defines Aboriginal rights as: practices, traditions and customs integral to the distinctive culture of the Aboriginal group claiming the right that existed prior to contact with the Europeans (Van der Peet). In the context of Métis groups, Aboriginal rights means practices, traditions, and customs integral to the distinctive culture of the Métis group that existed prior to effective European control, that is, prior to the time when Europeans effectively established political and legal control in the claimed area (*Powley*). Generally, these rights are fact and site specific. For greater certainty, the Guidelines also define Aboriginal title as an Aboriginal right. Visit the Indigenous and Northern Affairs Canada website at: www.aadnc-aandc.gc.ca/eng/1100100014680/1100100014681"

predicted future conditions with the project and the predicted future conditions without the project. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups.

- Measures identified to accommodate potential adverse impacts of the project on the potential or established Aboriginal or treaty rights, title and related interests. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them, and may go beyond mitigation measures that are developed to address potential adverse environmental effects;
- Potential adverse impacts on potential or established Aboriginal or treaty rights, title and related interests that have not been fully mitigated or accommodated as part of the EA and associated engagement with Aboriginal groups. The proponent will also take into account the potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups.

The information sources, methodology and findings of the assessment of paragraph 5(1)(c) effects may be used to inform the assessment of potential adverse impacts of the project on potential or established Aboriginal or treaty rights, title and related interests. However, there may be distinctions between the adverse impacts on potential or established Aboriginal or treaty rights, title and related interests and paragraph 5(1)(c) effects. 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.

In terms of gathering views from Aboriginal groups with respect to both environmental effects of the project and the potential adverse impacts of the project on potential or established Aboriginal or treaty rights, title and related interests, the EIS will document:

- VCs suggested by Aboriginal groups for inclusion in the EIS, whether they were included, and the rationale for any exclusions;
- specific suggestions raised by each Aboriginal group for mitigating the effects of changes to the environment on Aboriginal peoples or accommodating potential adverse impacts of the project on potential or established Aboriginal and treaty rights, title and related interests;
- views expressed by each Aboriginal group on the effectiveness of the mitigation or accommodation measures;
- from the proponent's perspective, any potential cultural, social and/or economic impacts or benefits to each Aboriginal group identified that may arise as a result of the project. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;
- any other comments, specific issues and concerns raised by Aboriginal groups and how they were responded to or addressed;
- changes made to the project design and implementation directly as a result of discussions with Aboriginal groups;
- where and how Aboriginal traditional knowledge was incorporated into the environmental effects assessment (including methodology, baseline conditions and effects analysis for all VCs) and the consideration of potential adverse impacts on potential or established Aboriginal or treaty rights, title and related interests and related mitigation measures; and
- any additional issues and concerns raised by Aboriginal groups in relation to the environmental effects assessment and the potential adverse impacts of the project on potential or established Aboriginal or treaty rights, title and related interests.

A suggested format for providing some of the information above is the creation of a tracking table of key issues raised by each Aboriginal group, including the concerns raised related to the Project, proposed mitigation options, and where appropriate, a reference to the proponent's analysis in the EIS. Information provided related to potential adverse impacts on potential or established Aboriginal or treaty rights will be considered by the Crown in meeting its common law duty to consult obligations as set out in the *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* (2011).

5.1 Aboriginal Groups to Engage & Engagement Activities

With respect to engagement activities, the EIS will document:

- the engagement activities undertaken with each Aboriginal group prior to the submission of the EIS, including the date and means of engagement (e.g., meeting, mail, telephone);
- any future planned engagement activities;
- how engagement activities by the proponent allowed Aboriginal groups to understand the project and evaluate its effects on their communities, activities, potential or established Aboriginal or treaty rights, title and related interests.

In preparing the EIS, the proponent will ensure that Aboriginal groups have access to timely and relevant information on the project and how the project may adversely impact them. The proponent will structure its Aboriginal engagement activities to provide adequate time for Aboriginal 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 consultation protocols, where available. The EIS will describe all efforts, successful or not, taken to solicit the information required from Aboriginal groups to support the preparation of the EIS.

The proponent will ensure that views of Aboriginal groups are recorded and that Aboriginal groups are provided with opportunities to validate the interpretation of their views. The proponent will keep detailed tracking records of its engagement activities, recording all interactions with Aboriginal groups, the issues raised by each Aboriginal group and how the proponent addressed the concerns raised. The proponent will share these records with the Agency.

For the Aboriginal 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:

- Innu First Nation of Essipit,
- Innu First Nation of Pekuakamiulnuatsh Takuhikan;
- Innu First Nation of Pessamit.

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 Aboriginal groups into the appropriate Aboriginal languages(s) in order to facilitate engagement activities during the EA.

For Aboriginal groups for which the Agency, in its preliminary analysis, provides that the project should have less potential effects on their communities, activities, potential or established Aboriginal or treaty rights and related interests, the proponent will 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. These Aboriginal groups include:

- Huron-Wendat First Nation

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 Aboriginal groups that the proponent will engage as additional information is gathered during the assessment.

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

6 EFFECTS ASSESSMENT

6.1 Project Setting and Baseline Conditions

Based on the scope of project described in section 3 (Part 1), the environmental impact statement will present baseline information in sufficient detail to enable the identification of how the project could affect the valued components and an analysis of those effects. Should other valued components be identified during the conduct of the environmental assessment, the baseline condition for these components will also be described in the environmental impact statement. To determine the appropriate spatial boundaries to describe the baseline information, refer to section 3.3.3 (Part 1). As a minimum, the environmental impact statement will include a description of:

6.1.1 Air Quality, Noise Environment and Climate

- ambient air quality at the project site and in the airshed likely to be affected by the project, by identifying and quantifying emission sources and, in particular, the following contaminants: total suspended particulates, fine particulates of less than 2.5 microns (PM_{2.5}), particulates of less than 10 microns (PM₁₀), carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), hydrogen sulfide (H₂S) and all other toxic air pollutants (mobile and stationary sources);
- direct and indirect sources of air emissions;
- existing greenhouse gas emissions (GHG), in the project study area, by individual pollutant measured as kilotonnes of CO₂ equivalent per year;
- GHG emission allowances imposed by federal, provincial and territorial governments⁷;
- current ambient noise levels at key receptor points (e.g., local and Aboriginal communities, and seasonal dwellings), including the results of a baseline ambient noise survey and information on typical sound sources, geographic extent and day–night variations;
- existing ambient night-time light levels at the project site, 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 Environmental Impact Statement will describe night-time light levels during different seasons and weather conditions;

⁷ See Environment and Climate Change Canada website : <http://climatechange.gc.ca/default.asp?lang=Fr&n=7F771E4A-1>

- multi-seasonal weather and climatic information, including historical data and baseline information on precipitation, mean, maximum and minimum temperatures, humidity, wind (duration, direction and strength), fog (frequency, duration) and extreme weather events.

6.1.2 Geology and Surface Deposit

- regional and local geological structures in the project area that could have an effect on the project components. Identified geological structures must include major structural elements and lesser important local structures, as well as their ecological functions and distribution in the local study area;
- description of the geological hazards that exist in the in the areas planned for the project facilities and infrastructure, including seismic risk parameters;
- relief, drainage and surficial deposits as well as areas vulnerable to erosion, landslides and submarine landslides;

6.1.3 Hydrographic Network and Saguenay River Characteristics

- 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;
- physicochemical characteristics of the affected watercourses;

For the Saguenay River

- detailed bathymetry (marine infrastructures area, approach channel and anchorage areas);
- surface and underwater current patterns and speeds, waves, tidal regime and water levels from tide gauges located nearby, at the port site and, if applicable, along shipping routes;
- characterization of the bottom sediment, including quality and thickness, particle size and mobility at the site where the structures will be built;
- sediment regime, including areas that are input sources (erosion), sediment transport and accumulation zones, particularly in dredging and backfilling areas and around potential open-water sediment disposal sites;
- where the structures will be built, the characterization of bottom sediments, including their nature, thickness, size and mobility;
- physicochemical characterization of sediments to be dredged and their toxicity, if applicable, using toxicity tests⁸ comparing them to *the Criteria for Evaluating Sediment Quality in Quebec and Application Frameworks: Prevention, Dredging and Remediation*;
- physicochemical characterization of sediments at open-water disposal sites comparing them to *the Criteria for Evaluating Sediment Quality in Quebec and Application Frameworks: Prevention, Dredging and Remediation*;

⁸ 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.

- ice dynamics in the study area, including ice formation, thickness, ridging, control activities and movement;
- ice conditions along shipping routes should also be analyzed, taking into account predicted climate change and its possible effect on the timing of ice formation in the future.

6.1.4 Riparian, Wetland and Terrestrial Environments

- characterization of soils in the excavation area, in terrestrial and riparian environments, with a description of past uses;
- topography, drainage, geology and hydrogeology, and the physicochemical characteristics of potential on-land sediment or soil disposal sites, with the exception of sites already authorized by the Quebec government;
- 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 (wetland class and form)⁹, the description of their ecological function (ecological, hydrological, wildlife, socioeconomic, etc.)¹⁰ and species composition;
- identification of ecosystems that are sensitive or vulnerable to acidification resulting from the deposition of atmospheric contaminants;
- plant and animal species (abundance, distribution and diversity) and their habitats, with a focus on species at risk¹¹ or with special status that are of social, economic, cultural or scientific significance as well as invasive alien species.

6.1.5 Fish and Fish Habitat

It should be noted that under CEEA 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;

⁹ Peatland Ecology Research Group (1997). *The Canadian Wetland Classification System*, see the internet site: http://www.env.gov.yk.ca/animals-habitat/documents/canadian_wetland_classification_system.pdf

¹⁰ Hanson, A., L. Swanson, D. Ewing, G. Grabas, S. Meyer, L. Ross, M. Watmough and J. Kirkby. 2008 *Wetland Ecological Functions Assessment: An Overview of Approaches*, Canadian Wildlife Service, Technical Report Series no 497, Atlantic Region, 59 pp

¹¹ In the guidelines, species at risk include the species in Appendix 1 of the *Species at Risk Act* and all species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but that are not yet included in Appendix 1 of the *Species at Risk Act*.

- 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 and special status species that appear on federal and provincial lists and that are found or are likely to be found in the study area;
- 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).

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.

6.1.6 Marine Plants (other aquatic species)

- characterization of marine plants likely to be affected by the project, including benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton;
- maps, at a suitable scale, indicating the surface area or zones occupied by the different types of algae surveyed;
- suitable habitats for federally and provincially listed species at risk and special status species that are found or are likely to be found in the study area.

6.1.7 Birds and their Habitats¹²

- 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 in the area (including waterfowl, raptors, shorebirds, marsh birds and other land birds), and species composition for each season;
- use of the sector by migratory and non-migratory birds during the year (e.g. winter, spring migration, breeding season, fall migration), taking into account preliminary data from existing sources;
- suitable habitats for federally and provincially listed species at risk or special status species that are found or are likely to be found in the study area.

6.1.8 Species at Risk and Special Status Species

- a list of all species at risk as defined under the *Species at Risk Act* (SARA) or special status species under provincial regulations whose presence in the study area is confirmed or probable and that may be affected by the project. This list may be established using existing data and literature, as well as surveys providing current field data. Species will be categorized based on the statuses in Schedule 1 of SARA and in provincial regulations;

¹² 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) 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.

- a list of all species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but not yet listed in Schedule 1 of SARA whose presence in the study area is confirmed or probable and that may be affected by the project. This list may be established using existing data and literature. The list will include species under the following categories: extirpated, endangered, threatened, and of concern¹³;
- any published studies that describe the regional importance, abundance and distribution of species at risk and special status species. The existing data must be supplemented by surveys, if required; and
- 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 and special status species that may occur in the project area, or be affected by the project.

6.1.9 Aboriginal Peoples

With respect to potential effects on Aboriginal peoples and the related valued components, baseline information will be provided for each Aboriginal group identified in section 5 (and any groups identified after these guidelines are finalized). Baseline information will describe and characterize the elements below in accordance with the spatial and temporal scope selected for the assessment.

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 not only identifying species of significance but also assessing the quality and quantity of preferred traditional resources and locations, timing (e.g., seasonality, access restrictions, distance from community), ambient/sensory environment (e.g., noise, air quality, visual landscape, presence of others) and cultural environment (e.g., historical/generational connections, preferred areas). 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;
- location of hunting camps and cabins and traditional gathering or teaching grounds;
- drinking water sources (permanent, seasonal, periodic, or temporary);
- reliance on country foods;
- commercial activities (e.g. fishing, trapping, hunting, forestry, outfitting, tourism);
- habits regarding the consumption of country foods;
- commercial activities (for example, fishing, trapping, hunting, forestry, outfitting);
- recreational uses of the project area;
- traditional uses currently practiced or practiced in recent history;
- fish, wildlife, birds, plants or other natural resources of importance for traditional use;
- places where fish, wildlife, birds, plants or other natural resources are harvested;
- access and travel routes for conducting traditional practices;
- frequency, duration or timing of traditional practices;
- cultural values associated with the area affected by the project and the traditional uses identified; and

¹³ Proponents are encouraged to consult COSEWIC's annual report for a listing of the designated wildlife species: http://www.cosewic.gc.ca/eng/sct0/index_e.cfm#sar

- physical and cultural heritage¹⁴ (including any site, structure or thing of archaeological, paleontological, historical or architectural significance).

Any other baseline information that supports the analysis of predicted effects on Aboriginal peoples will be included as necessary. The environmental impact statement will also indicate how input from Aboriginal 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.

6.1.10 Human Environment (Other than Aboriginal)

- rural and urban settings likely to be affected by the project;
- federal lands likely to be affected by the project;
- current use of lands in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters;
- current and proposed protected areas, special management areas and conservation areas in the regional study area;
- sources of drinking water in the study area, indicating surface water and groundwater collection facilities, private wells, wells serving more than 20 people, and municipal water intakes;
- current use of all waterways and water bodies in the study area that will be directly affected by the project, including commercial and recreational uses, where available;
- location and proximity of any permanent, seasonal or temporary residences or camps, community and institutional facilities (hospitals, schools, day care centres, etc.);
- health 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;
- characterization of the landscape surrounding the project that can be perceived from the sensitive receptors and valued sites;
- physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

6.2 Predicted Changes to the Physical Environment

The assessment 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 importance of adverse environmental effects, their geographic extent, the duration and frequency of change, and whether the changes to the environment 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 environmental impact statement will explain and describe the connections between the changes described.

¹⁴ Heritage resources to be considered will include but not be limited to, physical objects (e.g. middens, culturally-modified trees, historic buildings), sites or places (e.g. burial sites, sacred sites, cultural landscapes) and attributes (e.g. language, beliefs).

6.2.1 Changes to the Atmospheric Environment

- changes in air quality: in order to estimate the contaminant concentrations present in the entire area that could potentially be affected by atmospheric emissions (see Part 2, section 6.1.1)The proponent will carry out atmospheric dispersion modelling of the main contaminants from the different project activities (sources), including, but not limited to, those resulting from the use of heavy machinery during construction, from the operation of the natural gas liquefaction complex, as well as the road, rail and marine transportation (including vessel and tugboat approach and berthing manoeuvres). The proponent must compare anticipated air quality against the *Canadian Ambient Air Quality Standards* for fine particulate matter and ozone and Quebec atmospheric quality standards and criteria;
- a description of all methods and practices (e.g., control equipment, heat or gas recovery systems) that will be implemented to minimize and control atmospheric emissions throughout the project life cycle. If the best available technologies are not included in the project design, the proponent will need to provide a rationale for the technologies selected.
- a description of all methods or practices to be implemented to minimize or control atmospheric emissions, during the complete project's lifecycle. If the best available technologies are not selected for the design of the project, the proponent will justify its choices;
- an estimate of the direct greenhouse gas emissions (GHG) associated with all phases of the Project and any mitigation measures proposed to minimize those greenhouse gas emissions, and any upstream GHG emissions. This information is to be presented in a separate section of the EIS, by individual pollutant, and should also be summarized in kilotonnes of CO₂ equivalent per year :
 - an estimate of the contribution of the project emissions at the local, provincial and federal scale must be provided. The proponent must 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);
 - a GHG emissions management plan should also be provided, describing the potential for fugitive emissions and the methods used to detect and repair leaks in the liquefaction complex and associated infrastructure;
 - all estimated emissions and emission factors used should be justified;
 - provide the estimation or derivation method and all assumptions and emission intensity factors should be disclosed and described;
 - compare and assess the level of estimated emissions to the regional, provincial and federal emission targets;
 - present the information related to the project's electrical demand and sources of electrical power for facilities and equipment, i.e., the project's main source and any other additional sources (generators, etc.), as appropriate;
 - an estimate of the GHG emissions associated with the facility's natural gas supply. This should include all natural gas to be processed at the proposed LNG facility and, if any, natural gas consumed for power generation at the proposed LNG facility or other on-site processes. This estimate should include all processes upstream of the proposed LNG facility. "Upstream" includes, but is not limited to, natural gas production, processing and transport;
 - the estimate should include all GHG emissions during the operational lifetime of the proposed LNG facility, on an annual basis. In cases where gas supply source has not yet been determined, the proponent should estimate using a typical or average gas mix for the region;

- Emission factors for all upstream stages should be recent and pertinent to the region.
- should residual GHG emissions remain after mitigation is applied, an analysis of the cumulative GHG emissions of current (e.g., facilities in operation) and reasonably foreseeable (e.g., proposed) projects should also be included in the cumulative effects assessment;
- changes in ambient noise levels: Compare current noise levels (without the project) with projected noise levels. The proponent will be required to compare projected noise levels against the criteria in Instruction No. 98-01 dealing with noise, the criteria in municipal or regional regulations covering the study area, as well as World Health Organization (WHO) criteria, particularly with respect to sleep;
- changes in night-time light levels.

6.2.2 Changes to Watercourses and the Saguenay River

- 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* and the Quebec criteria for water quality;
- impact of the changes on hydrodynamic conditions (current velocity and distribution), the ice regime and the thermal regime;
- streambed erosion on both sides of the dredging areas, if applicable;
- shoreline and bank erosion caused by wave action from ships;
- impact of the changes in the sedimentologic regime and identification of potential areas of resedimentation of suspended particulates;
- the modelling of the dispersion plume from sediments that could be resuspended during dredging or disposal in the aquatic environment (if any);
- changes in environmental quality caused by resuspension of contaminated sediment;
- effects of runoff or drainage on the quality of surface water, particularly drinking water, and the comparison to predict water quality with the *Guidelines for Canadian Drinking Water Quality* and *Guidelines for Recreational Water Quality*;
- changes in underwater noise levels which will be caused by the work during the terminal construction phase and by the increase in marine traffic during the operation phase.

6.2.3 Changes to Riparian, Wetland and Terrestrial Environments

- changes related to disturbance of riparian, wetland and terrestrial environments;
- changes to the habitat of migratory and non-migratory birds, with a distinction made between the two bird categories, 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 or residence of species at risk or special-status species that appear on the federal and provincial lists;
- changes to key habitat for plant and animal species, including those that are important to the current use of resources by Aboriginal and non-Aboriginal peoples;
- potential for ecosystem acidification, i.e., the input of acid through substances such as nitrate and sulphates, taking into account the environment's chemical and geochemical exchange processes.

This potential will be estimated through atmospheric dispersion modelling of contaminants and their settling to the ground.

6.3 Predicted Effects on Valued Components

Based on the predicted changes to the environment identified in section 6.2 (Part 2), the proponent is to assess the environmental effects of the project on, but not limited to, the followings valued components as per Section 5 of CEAA 2012.

6.3.1 Fish and Fish Habitat

- the identification of any potential harmful alteration, disruption or destruction of fish habitat, 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 proponent must take into account the surface areas of the natural habitats that are affected by dredging, digging or backfilling in the aquatic environment at the planned work sites, as well as in peripheral areas likely to be affected. 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 impacts 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.
- 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, included shellfish and forage fish and special-status species that appear on the federal and provincial lists;
 - any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barrier);
 - any modifications of habitats or their use by species at risk or special status species included on federal and provincial lists, including those evaluated by COSEWIC.
- a discussion of how project construction timing interact with key fisheries windows for freshwater, marine and anadromous species, and any potential impacts 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 during the operation phase on fish behaviour and mortality when they feed, breed, nurse or migrate.

6.3.2 Marine Plants

- the effects of changes to the aquatic environment on marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton and special status species that appear on the federal and provincial lists.

6.3.3 Birds and their Habitats

- mortality of migratory and non-migratory birds, with a distinction made between the two birds category, that could be directly caused, but not limited to, by tree clearing, site clearing, the presence of flares or birds and nests being in contact with contaminated substances;
- indirect effects caused by increased disturbance (e.g. noise, light, etc), relative abundance movements and loss of and changes in migratory and non-migratory bird habitat;
- collision risk of migratory and non-migratory birds with any project infrastructures including flare stacks;
- analysis of the previously identified effects must also cover the species at risk and special status species included on the federal and provincial lists as well as the critical habitat or residence of these species.

6.3.4 Aboriginal Peoples

With respect to Aboriginal peoples, a description and analysis of how changes to the environment caused by the project will affect:

- the current uses of land and resources for traditional purposes, including, but not limited to:
 - any effects on resources (fish, wildlife, birds, plants or other natural resources) used for traditional uses and activities related to the use of those resources(e.g. hunting, fishing, trapping, collection of medicinal plants, use of sacred sites);
 - any effects of alterations to access into the areas used for traditional uses, including development of new roads, deactivation or reclamation of access roads and changes to waterways that affect navigation;
 - any effects on cultural value or importance associated with traditional uses or areas affected by the project (e.g. inter-generational teaching of language or traditional practices, communal gatherings);
 - how project construction timing interfere with the timing of traditional practices, and any potential impacts resulting from overlapping periods;
 - the regional value of traditional use of the project area and the anticipated effects to traditional practice of the Aboriginal group, including alienation of lands from Aboriginal traditional use;
 - effects such as avoidance of the area by Aboriginal peoples due to increased disturbance (e.g. noise, presence of workers); and
 - an assessment of the potential to return affected areas to pre-disturbance conditions to support traditional practices.
- human health, considering, but not limited to, potential changes in air quality, quality and availability of country foods, drinking water quality, and noise exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health;
- socio-economic conditions, including but not limited to:
 - the use of navigable waters;
 - commercial fishing, hunting, trapping, and gathering activities;
 - the use of the sector by outfitters for commercial purposes;

- the use of the sector for recreational purposes.
- physical and cultural heritage, and structure, site or thing of historical, archaeological, paleontological or architectural significance to Aboriginal 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.

6.3.5 Changes to the environment that would occur on federal or transboundary lands or related to the exercise of a federal duty (permit, authorization)

The Environmental Impact Statement will include a stand-alone section that summarises changes the project may cause to the environment on federal lands, outside Canada or related to the exercise of a federal duty (permit, authorization). Consequently, the proponent, in addition to examining the previously mentioned effects, must also examine effects on the following valued components:

- air quality;
- watercourses;
- fauna and flora and their habitats, wetlands, including on federally and provincially listed species at risk and special status species, as well as effects on their habitats, including their residences or critical habitats;
- contribution to climate change;
- human environment (other than Aboriginal) including how changes to the environment caused by the project will affect:
 - health and socioeconomic status, including, but not limited to, effects on:
 - resources (fish, wildlife species, birds, plants or other natural resources) used for recreational or commercial purposes (e.g. hunting, fishing, trapping);
 - human health in relation to air quality, possible contamination of local foods, drinking water quality, and exposure to light and noise. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health.
 - the visual environment and effects that changes to the aesthetic quality of the landscape could have on businesses that rely on the aesthetic and recreational interest of the area;
 - land uses and access to the project area;
 - navigation, including, if applicable, the distinction between the various types of navigation and vessels (commercial, recreational, traditional), taking into account these distinctions in the description and assessment of the effects;
 - physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance, including, but not limited to, effects on:
 - unique sites or special characteristics, such as ecologically sensitive zones, reserves or protected areas.

6.4 Mitigation

Every environmental assessment 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. Each measure 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 environmental assessment 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. When the principles of avoidance and reduction of the effects at the source have been applied, the loss of wildlife habitat may be compensated by creating or improving equivalent habitats.

The environmental impact statement 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 (including the measures directed at promoting beneficial or mitigating adverse socio-economic effects. The environmental impact statement 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 environmental impact statement 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 environmental impact statement will then describe mitigation measures, including compensation plans (if needed), that are specific to each environmental effect identified. Measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation is designed to address. Where mitigation measures have been identified in relation to species and/or critical habitat listed under the *Species at Risk Act*, the mitigation measures will be consistent with any applicable recovery strategy and action plans.

The environmental impact statement 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 impact statement 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 environmental impact statement 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 will be justified. The environmental impact statement 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 environmental impact statement will identify the extent to which technology 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.

Adaptive management is not considered as a mitigation measure, but if the follow-up program (refer to section 9) indicates that corrective action is required, the proposed approach for managing the action should be identified.

6.5 Significance of Residual Effects

After having established the technically and economically, including compensation plans (if required), feasible mitigation measures, the environmental impact statement will present any residual environmental effects of the project on the valued components identified in section 6.3. The residual effects, even if very small or deemed insignificant will be described.

The environmental impact statement will then provide an analysis of the significance of the residual environmental effects that are considered adverse, using guidance described in section 4 of the Agency's reference guide *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*¹⁵.

The environmental impact statement 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, technical and regulatory agencies, Aboriginal groups and the public to review the proponent's analysis of the significance of effects. The environmental impact statement will document the terms used to describe the level of significance.

The methods and techniques selected for assessing the impacts must be objective, concrete and reproducible. Readers should find it easy to follow the reasoning given for determining and assessing the impact. The following criteria should be used in determining the significance of residual effects:

- magnitude;
- geographic extent;
- duration;
- frequency;
- reversibility;
- ecological and social context; and
- existence of environmental standards, guidelines or objectives for assessing the impact.

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 environmental impact statement 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 valued component.

Where significant adverse effects are identified, the environmental impact statement 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 its environmental analysis.

6.6 Other Effects to Consider

6.6.1 Effects of the Environment on the Project

The environmental impact statement 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, hydrologic conditions, freezing rain and seismic events) could adversely affect the project and how this in turn could result in impacts to the environment (e.g., extreme environmental

¹⁵ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/default.asp?lang=En&n=D213D286-1&offset=&toc=hide

conditions result in malfunctions and accidental events). These events will be considered in different probability patterns (i.e. 5-year flood vs. 100-year flood). Longer-term effects of climate change will also be discussed up to the projected post-closure phase of the project. This discussion will include a description of climate data used.

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

6.6.2 Effects of Potential Accidents or Malfunctions

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

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 CEEA 2012), the plausible worst case scenarios and the effects of these scenarios.

For each scenario, 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 CEEA 2012.

The environmental impact statement will describe the safeguards that have been established to protect against such occurrences and the contingency and emergency response procedures in place if such events do occur.

Linked to shipping in the waters under the jurisdiction of the Saguenay Port Authority

The proponent will describe and assess the potential environmental impacts of accidents and malfunctions resulting from marine shipping associated with the project, including the impacts on social, economic or cultural environmental factors and on the health of individuals near the spilled contaminants. The proponent will take into account contributing factors such as weather conditions or external events.

The proponent will also assess the potential for accidental major and minor release of fuel oil or loss of dangerous cargo. If required, the proponent will also provide an analysis of the potential environmental effects of these releases on the marine and terrestrial environments and on human health within the spatial boundaries set out in this document.

The proponent will also outline existing emergency response mechanisms and existing response organization provisions within the spatial boundaries of the marine shipping associated with the project. The proponent will describe the action to be taken in the event of spills, collisions, groundings or any other accidents or malfunctions in or near the affected shipping area, including emergency spill response exercise or training plans.

6.6.3 Cumulative Effects Assessment

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*.

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. Cumulative effects may result if:

- implementation of the project being studied may cause direct residual adverse effects on the valued components, taking into account the application of technically and economically feasible mitigation measures; and
- the same valued components may be affected by other past, present or reasonably foreseeable physical activities.

Valued components 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 environmental impact statement, the proponent will:

- identify and provide a rationale for the valued components that will constitute the focus of the cumulative effects assessment, emphasizing this assessment on the valued components 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 the beluga;
 - migratory and non-migratory birds;
 - for each species at risk and special status species;
 - Aboriginal peoples;
 - any other relevant component;
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each valued component selected. The boundaries for the cumulative effects assessments will generally be different for each valued component 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. The cumulative effect assessment will specifically have to consider related projects not included in the scope of project listed at section 3.1 and the potential marine terminal project on the north shore of Saguenay by the Saguenay Port Authority, which is planning to install a multi-user terminal at Ste-Rose-du-Nord 30 km northeast of the project. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEEA 2012;
- 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 environmental impact statement 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 prior to finalizing the choice of valued components and the appropriate boundaries to assess cumulative effects.

7 SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT

The environmental impact statement will contain a table summarising the following key information:

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

The summary table will be used in the environmental assessment Report prepared by the Agency. An example of a format for the key summary table is provided in Appendix 1 of this document.

The environmental impact statement will also contain a second table summarising the main mitigation measures and proponent's commitments that will mitigate any significant adverse impact of the project on the valued components (i.e. measures which are essential to ensure that the project will not cause significant adverse environmental impacts).

8 MONITORING AND FOLLOW-UP PROGRAMS

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. 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.

8.1 Monitoring

The proponent will prepare an environmental monitoring program for all phases of the project. This program will help ensure that the project is implemented as proposed, that the mitigation or compensation measures proposed to minimize the project's environmental effects are effectively implemented, and that the conditions set at the time of the project's authorization and the requirements pertaining to the relevant laws and regulations are met. The monitoring program will also make it possible to check the proper operation of works, equipment and facilities. If necessary, the program will help reorient the work and possibly make improvements at the time of construction and implementation of the various elements 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 components and the measures and means planned to protect the environment;
- 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.

8.2 Follow-up Program

The duration of the follow-up program shall be as long as required for the environment to regain its equilibrium and to evaluate the effectiveness of the mitigation measures.

The environmental impact statement shall present a preliminary follow-up program in particular for areas where scientific uncertainty exists in the prediction of effects. This program shall include:

- objectives of the follow-up program and the valued components targeted by the program;
- list of elements requiring follow-up;
- number of follow-up studies planned as well as their main characteristics (list of the 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 take advantage of the participation of Aboriginal groups and stakeholders on the affected territory, during the implementation of the program;
- 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 MARINE SHIPPING

The proponent should maximise the use of existing material that is relevant to marine shipping activities associated with the Project which is beyond proponent's care and control and taking place in the Beluga's critical habitat, the Saguenay–St. Lawrence Marine Park, the Nitassinan of the Innu First Nation of Essipit and the shared territory (southwestern portion) of the Innu First Nations of Essipit, Pekuakamiulnuatsh Takuhikan and Pessamit. Existing material may include academic studies, work of government and non-government working groups, past or ongoing environmental assessments, Aboriginal traditional knowledge reports or any other source the proponent deems appropriate for presentation purposes.

9.1 Valued components

Using the procedure outlined in section 3.3.2, the proponent will identify valued components that could be affected by any environmental effects that may result from marine shipping associated with the Project.

At a minimum, the proponent will consider the effects on:

- fish and fish habitat, including marine mammals, particularly the Beluga;
- migratory birds and their habitats (aquatic grassbeds, intertidal marshes, etc.)
- species at risk and species of special status federally and provincially listed;
- current use of lands and resources by Aboriginal peoples including fishing, hunting, cultural practices, and sites of importance; and
- tourism and commercial and recreational fishing activities, including cruises, boating activities, ice fishing and sea urchin fishing.

9.2 Spatial Boundaries

The proponent will examine the environmental effects resulting from marine shipping associated with the project that are outside of the proponent's responsibility and control and that could occur in the Beluga's critical habitat, the Saguenay–St. Lawrence Marine Park, the Nitassinan of the Innu First Nation of Essipit and the shared territory (southwestern portion) of the Innu First Nations of Essipit, Pekuakamiulnuatsh Takuhikan and Pessamit.

The proponent will determine the spatial boundaries of the various environmental effects resulting from marine shipping associated with the Project based on the approach described in Section 3.3.3.

The spatial boundaries should take into account the areas that could potentially be affected by the worst-case scenario for dispersal of fuel oil or other cargo, or other scenarios considered in the assessment of the potential effects related to accidents and malfunctions.

9.3 Temporal Boundaries

The temporal boundaries for the consideration of marine shipping associated with the Project shall be based on the approach outlined in Section 3.3.3.

9.4 Description of marine shipping associated with the Project

9.4.1 Marine Shipping Overview

The proponent will provide information related to marine shipping associated with the Project. This information will include an overview of the existing regulatory framework and role of governments, authorities or other organizations involved in shipping activities – especially for emergency response to safety or environmental emergencies, including communication planning. The proponent will provide an overview of developments in shipping (past and future).

9.4.2 Description of Activity

The EIS will include a detailed description of the marine shipping activities associated with the Project (within the spatial boundaries identified in section 9.2), including:

- vessel frequency throughout the project life cycle; vessel type, size, noise level produced, itinerary, speed and passage time;
- associated activities such as ballasting, anchorage, maneuvering, loading, bunkering and fuel types used, pilotage, and tugboat escort; and
- alternatives means considered, such as different routing, frequency and vessel types.

9.5 Baseline Conditions

The proponent shall refer to section 6.1 and its subsections when describing the baseline conditions for the existing environment along the shipping route.

9.5.1 Existing Marine Environment

The proponent will provide the following information:

- a description of the physical characteristics of the marine environment and riparian environments along the proposed shipping route (bathymetry, tide, currents, ice conditions, etc.);

- a description and mapping of marine and riparian habitats in areas likely to be affected by the environmental effects resulting from shipping or by accidents and malfunctions, including a description of species present, in accordance with the requirements of section 6.1;
 - fish and marine mammals;
 - migratory and non-migratory birds;
 - federally or provincially listed species at risk and special status species;

9.5.2 Existing Human Environment

The proponent will provide the following information:

- a description of the types and sizes of vessels currently operating within the spatial boundaries defined in section 9.2, particularly those likely to be encountered by vessels associated with the Project. Variations in traffic density statistics, types of cargo, origins and destinations;
- a description of commercial, traditional and sport fishing activities, including:
 - aboriginal and non-Aboriginal activities, as well as seasonality of these activities (including ice fishing);
 - types, number, size and capacity of fishing vessels used in the area, fishing gear types and existing interactions with shipping;
 - commercial, recreational and aboriginal fisheries statistics (e.g. species, annual catch and number of licenses);
 - maps of fishing areas in the study area and descriptions of their relative importance in a broader regional context (e.g. representative percentage of regional landings or economic value);
- a description (including maps) of cultural and historical resources, and archaeological sites that may be affected by the marine shipping associated with the Project;
- a description of tourism activities and their economic impacts relating to the biophysical attributes of the Saguenay and the St. Lawrence rivers;

9.6 Effects Assessment and Mitigation Measures

The proponent shall refer to Section 6.3 to 6.6 inclusively and its subsections when conducting the effects assessment for marine shipping associated with the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the designated project and any cumulative environmental effects, the significance of the effects, mitigation measures and the possible requirements of any follow-up program that may be required. The proponent will, where relevant, present as accurately as possible the anticipated effects on the valued components described in section 9.1

Where necessary, the proponent will consult with federal government departments and agencies to obtain further specific guidance related to the identification and analysis of environmental effects.

Appendix 1 Example - Summary Table of Environmental Assessment

Valued Component affected	Area of federal jurisdiction ¹⁶ (v)	Project Activity	Potential adverse effects	Proposed mitigation measures	Residual adverse effects	<i>Magnitude</i>	<i>Duration</i>	<i>Frequency</i>	<i>Reversibility</i>	<i>Other criteria used to determine significance</i>	Significance of residual adverse effect
Fish and fish habitat											
Marine plants											
Migratory birds											
Terrestrial animals											
Species at risk											
Current use of land and resource for traditional purpose	v 5(1)(c)(iii)										
Human environment											
Any other valued components identified											

¹⁶ 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 this Act is relevant. For example, for the valued component “Use of land and resources by Aboriginal people”, the appropriate cell would indicate, section 5(1)(c)(iii).