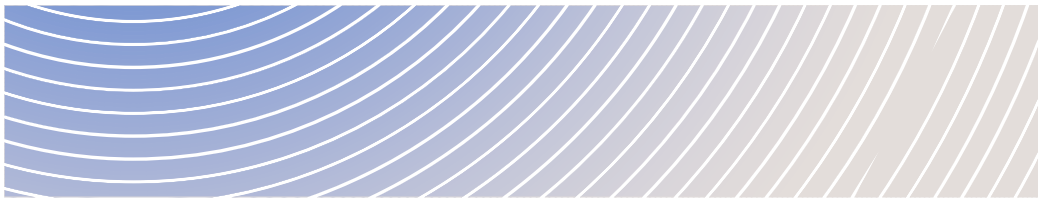
Gazoduq Project



TAILORED ENVIRONMENTAL IMPACT STATEMENT GUIDELINES PURSUANT TO THE *IMPACT ASSESSMENT ACT* AND THE *CANADIAN ENERGY REGULATOR ACT*

January 30, 2020

Draft

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

Canada

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Abbreviations and Short Forms

ADR	Appropriate Dispute Resolution
AFUDC	Allowance for Funds Used During Construction
Agency	Impact Assessment Agency of Canada
bbl	barrel
BCR	bird conservation regions
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
CER Act	Canadian Energy Regulator Act
CER	Canada Energy Regulator
cf	cubic feet
cf/d	cubic feet per day
CIF	cost, insurance and freight
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA Z662	Canadian Standards Association Standard Z662, Oil and Gas Pipeline Systems latest version as amended from time to time
CSA	Canadian Standards Association
DFO	Fisheries and Oceans Canada
DPR – Authorizations	National Energy Board Act Damage Prevention Regulations – Authorizations
ECCC	Environment and Climate Change Canada
EPP	Environmental Protection Plan
ESA	Endangered Species Act (Ontario)
FA	federal authority
GBA+	Gender-Based Analysis Plus
GHG	greenhouse gas
GPUAR	Gas Pipeline Uniform Accounting Regulations
H_2S	hydrogen sulphide
HIA	Health Impact Assessment
IA	Impact Assessment
ISO	International Organization for Standardization
kPa	kilopascals
LEMV	Act respecting threatened or vulnerable species (Quebec)
LNG	liquefied natural gas
m^3	cubic metres
Minister	Minister of Environment and Climate Change
MJ/m^3	megajoules per cubic metre
MOP	maximum operating pressure
MPa	megapascals

MPB	market-based procedure
NGL	natural gas liquids
NO_2	nitrogen oxide
NOC	National Occupation Classification
NPRI	National Pollutant Release Inventory
NSCA	Nuclear Safety and Control Act
O_3	ozone
OPR	National Energy Board Onshore Pipeline Regulations
OPUAR	Oil Pipeline Uniform Accounting Regulations
P&ID	process and instrumentation diagram
Part IV Regulations	National Energy Board Act Part VI (Oil and Gas) Regulations
Post-construction report	post-construction environmental monitoring report
PPBoR	plans, profiles and books of reference
PPR	National Energy Board Processing Plant Regulations
QA	quality assurance
Registry	Canadian Impact Assessment Registry
Reporting Regulations	National Energy Board Export and Import Reporting Regulations
RoW	right of way
Rules	National Energy Board Rules of Practice and Procedure, 1995
SACC	Strategic Assessment of Climate Change
SARA	Species at Risk Act
TIS Guidelines	Tailored Impact Statement Guidelines
UTM	Universal Transverse Mercator
VC	valued component (including environmental, health, social, economic and potentially other elements of the natural and human environment)

PART 1 – DRAFT TAILORED IMPACT STATEMENT GUIDELINES

1. Introduction

The federal Impact Assessment (IA) process serves as a planning tool that considers a broad range of potential environmental, health, social and economic effects of designated projects identified by regulation or designated by the Minister of Environment and Climate Change (the Minister). Decisions are based on whether the potential adverse effects in areas of federal jurisdiction are in the public interest. The public interest determination is guided by the factors set out in the *Impact Assessment Act* (IA Act):

- the proposed designated project's contribution to sustainability;
- the extent to which potential effects are adverse;
- measures to mitigate potential adverse effects;
- potential impacts on Indigenous peoples1 and their rights; and
- potential impacts on Canada's ability to meet its environmental obligations and its climate change commitments.

A key element for the federal impact assessment process is the preparation of Tailored Impact Statement Guidelines (TIS Guidelines).[2] The guidelines will provide the proponent with direction and requirements for the preparation of an Impact Statement. Under the IA Act, designated projects that are also regulated by the Canadian Energy Regulator (CER), such as Gazoduq, will be assessed by an integrated review process. For this type of project, the TIS Guidelines will be developed by the Impact Assessment Agency of Canada (Agency) in coordination with the CER and will identify information requirements under both the IA Act and the *Canadian Energy Regulator Act* (CER Act).

The guidelines are tailored for the designated project during the IA planning phase by the Agency. These draft guidelines serve as the basis from which the final guidelines are developed, a process informed by consulting the public, Indigenous groups, lifecycle regulators, federal authorities (FAs) and other interested parties. The comment period on the draft guidelines for the Gazoduq Project will run from January 30 to March 10, 2020.

The draft guidelines have taken into account the comments of some FAs and the CER, which had previously submitted proposed amendments to the Guidelines Template[3] to tailor it to the Gazoduq Project. The comments of the FAs and the CER are part of the Project File.

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[1] These guidelines use the term "Indigenous peoples" to represent the "aboriginal peoples of Canada" which includes Indian, Inuit and Métis peoples as defined in subsection 35(2) of the *Constitution Act, 1982*, and the term "Indigenous rights" is used to reflect the full scope of potential or established Aboriginal and Treaty rights recognized and affirmed by section 35 of the *Constitution Act 1982*.

[2] As set out in paragraph 18(1)(b) of the *Impact Assessment Act.*

[3] The Guidelines Template is posted in the *Practitioner's Guide to Federal Impact Assessments under the Impact Assessment Act* on the Agency's website: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act.html

Part 3 sets out the CER Act requirements that are necessary to make CER Act related decisions. Proponents should also consult the CER's interim guidance, where applicable, and the guidance provided in the CER's Filing Manual, which remain relevant (see reference documents - Part 3). More specifically, the CER's Filing Manual provides further guidance with respect to several of the filing requirements described below.

Efforts have been undertaken to ensure alignment between the requirements of the TIS Guidelines and of the interim guidance of the CER's Filing Manual related to the IA Act and CER Act.

While the TISG Template does not prescribe a preferred structure for the Impact Statement, it is essential that the Impact Statement address all requirements outlined in the TIS Guidelines. The proponent may present the information in the Impact Statement in the manner it deems most appropriate. To facilitate review of the Impact Statement, a table of concordance must be provided that identified where each requirement of the TIS Guidelines is located within the Impact Statement.

1.1. Factors to be considered in the Impact Assessment

The TIS Guidelines correspond to factors to be considered in the IA. These factors are listed in subsection 22(1) of the IA Act and prescribe that the IA of a designated project must take into account:

a) the changes to the environment or to health, social or economic conditions and the positive and negative consequences of these changes that are likely to be caused by the carrying out of the designated project, including:
    (i) the effects of malfunctions or accidents that may occur in connection with the designated project;
    (ii) any cumulative effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out; and
    (iii) the result of any interaction between those effects;
b) mitigation measures that are technically and economically feasible and that would mitigate any adverse effects of the designated project;
c) the impact that the designated project may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*;
d) the purpose of and need for the designated project;
e) alternative means of carrying out the designated project that are technically and economically feasible, including through the use of best available technologies, and the effects of those means;
f) any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;
g) Indigenous knowledge provided with respect to the designated project;

h) the extent to which the designated project contributes to sustainability;
i) the extent to which the effects of the designated project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change;
j) any change to the designated project that may be caused by the environment;
k) the requirements of the follow-up program in respect of the designated project;
l) considerations related to Indigenous cultures with respect to the designated project;
m) community knowledge provided with respect to the designated project;
n) comments received from the public;
o) comments from a jurisdiction that are received in the course of consultations conducted under section 21 of the IA Act;
p) any relevant assessment referred to in sections 92, 93 or 95 of the IA Act*;*
q) any assessment of the effects of the designated project that is conducted by or on behalf of an Indigenous governing body and that is provided with respect to the designated project;
r) any study or plan that is conducted or prepared by a jurisdiction—or an Indigenous governing body not referred to in paragraph (f) or (g) of the definition *jurisdiction* in section 2 of the IA Act—that is in respect of a region related to the designated project and that has been provided with respect to the project;
s) the intersection of sex and gender with other identity factors; and
t) any other matter relevant to the IA that the Agency or—if the IA is referred to a review panel—the Minister requires to be taken into account.

The scope of the factors in paragraphs 22(1)(a) to (f), (h) to (l), (s) and (t) that are to be taken into account, including the extent of their relevance to the impact assessment, is determined by the Agency and will be outlined in the TIS Guidelines.

For an integrated review panel with the CER, the factors listed in subsection 183(2) of the CER Act also apply. These factors are the following:

a) the environmental effects, including any cumulative environmental effects;
b) the safety and security of persons and the protection of property and the environment;
c) the health, social and economic effects, including those related to the intersection of sex and gender with other identity factors;
d) the interests and concerns of the Indigenous peoples of Canada, including with respect to their current use of lands and resources for traditional purposes;
e) the effects on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*;
f) the availability of oil, gas or any other commodity to the pipeline;
g) the existence of actual or potential markets;
h) the economic feasibility of the pipeline;

i) the financial resources, financial responsibility and financial structure of the applicant, the methods of financing the pipeline and the extent to which Canadians will have an opportunity to participate in the financing, engineering and construction of the pipeline;
j) the extent to which the effects of the pipeline hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change;
k) any relevant assessment referred to in section 92, 93 or 95 of the Impact Assessment Act; and;
l) any public interest that the Commission considers may be affected by the issuance of the certificate or the dismissal of the application.

The proponent is required to provide the information in a machine-readable, accessible format, in order to support the Government of Canada's commitment to open science and data and facilitate the sharing of information with the public through the Agency's Registry and Internet site and the government's open science and data platform. The proponent should contact the Agency to obtain additional direction regarding the format and distribution of the Impact Statement.

PART 2 – CONTENT – TAILORED IMPACT STATEMENT GUIDELINES

The following template presents the type of information that may be required in the TIS Guidelines for a designated project. Each section in the template represents a category of information that may be requested as part of the TIS Guidelines. Each section provides:

- general guidance on how to collect, analyze and present the information, including some examples of what to consider; and
- a comprehensive list of specific information requirements that may be included in the TIS Guidelines. In developing the Guidelines, the Agency will tailor these lists to include only those relevant to a specific project.

The format of this document is not meant to be the format followed for the Impact Statement. The proponent should present the information in a manner that works for their specific project.

1. Overview

1.1. Proponent

The Impact Statement must:

- provide contact information of proponent representatives for the project (e.g. name, address, phone, fax, email);
- identify the proponent(s) and, where applicable, the name of the legal entity(ies) that would develop, manage and operate the project;
- describe the corporate structure;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and
- identify key personnel, contractor, and/or sub-contractors responsible for preparing the Impact Statement and conducting the Impact Assessment.

1.2. Project overview

The Impact Assessment must describe the designated project, including physical project activities and key components, scheduling details, implementation milestones and any other key features. If the project is part of a larger sequence of projects, the Impact Statement must outline the larger context.

The preliminary list of the project's key physical activities was drafted based on the detailed project description and will be finalized during the preparatory phase of the assessment. The project is defined as being physical activities including the construction, operation, decommissioning and closure of a new natural gas pipeline, and incidental physical activities (designated project). The

following physical activities are incidental to the designated physical activities and are thus part of the project:

- three compressor stations;
- one measuring station;
- all block valve stations (about 25) on the natural gas pipeline;
- all pipeline inspection facilities, including the launcher stations (4) and receiver stations (4);
- operations control centre;
- all ancillary facilities (e.g., surveillance system, data control and acquisition system, cathodic protection system).

The new natural gas pipeline would connect TC Energy's main natural gas pipeline network in northeast Ontario to a natural gas liquefaction, storage and export complex in Saguenay, Quebec. In November 2015, the proponent, GNL Québec Inc., submitted to the Agency (former Canadian Environmental Assessment Agency) a description for a proposed project including a new natural gas liquefaction and storage facility and a new maritime terminal in Saguenay, Quebec. This project's environmental assessment, carried out by the Agency under the *Canadian Environmental Assessment Act, 2012*, started in January 2016 and is still underway. The proponent, Gazoduq Inc., submitted an initial description of a natural gas pipeline project under the *Impact Assessment Act* in October 2019, thus triggering the planning phase for an impact assessment.

In keeping with the transitional provisions of the *Impact Assessment Act*, the environmental assessment of GNL Québec Inc.'s project must be done in accordance with the *Canadian Environmental Assessment Act, 2012*. The direct and incidental effects of all physical activities of the projects of GNL Québec Inc., including marine shipping, and Gazoduq Inc. will be assessed as part of the separate federal assessment process. The cumulative effects of both projects, combined with those of other physical activities, past or future, will be assessed as part of the assessments of each project.

1.3. Project location

The Impact Statement must describe the geographical setting and socio-ecological context in which the project is to take place. Focus the description on aspects of the project and its settings that are important in order to understand the potential environmental, health, social and economic effects and impacts of the project. The following information must be included and, where appropriate, located on maps:

- the geographic coordinates (latitude and longitude according to international conventions in degrees, minutes and seconds) of the pipeline's start and end points;
- current land and/or aquatic uses in the area;
- distance of the project components to any federal lands and the location of any federal lands within the regional study area;

- all waterbodies (permanent and temporary) affected by the project, including their location on a map;
- navigable waters;
- 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, territorial and regional parks, UNESCO World Heritage Sites, ecological reserves, ecologically and biologically sensitive areas, wetlands, estuaries, and habitats of federally or provincially listed species at risk and other sensitive areas;
- lands subject to conservation agreements;
- description and locations of all potable drinking water sources (i.e. municipal or private);
- description of local and Indigenous groups;
- Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, Indian Reserve lands, Indigenous harvesting regions (with permission of Indigenous groups), Métis settlements;
- if the information is available, the surface area (in hectares) of traditional or Title lands required to identify the project's land tenure by component; and
- culturally important features of the landscape.

Maps are to be provided to the Agency as electronic geospatial data files compliant with the ISO 19115 standard.

1.4. Regulatory framework and the role of government

The Impact Statement must identify:

- any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the project or associated activities;
- legislation and other regulatory approvals that are applicable to the project at the federal, provincial, regional and municipal levels or from any body—including a co-management body—established under a land claim agreement referred to in section 5 of the *Constitution Act, 1982*, or from an Indigenous governing body as defined in the *Impact Assessment Act* that has powers, duties or functions in relation to the environmental effects of a project, including a list of federal, provincial or territorial GHG acts, policies or regulations that will apply to the project, in accordance with the draft strategic assessment of climate change (SACC);
- government policies, resource management plans, planning or study initiatives relevant to the project and/or Impact Assessment (IA) and their implications, including relevant regional studies and strategic assessments;

- any treaty, self-government, land claims or other agreements between federal or provincial governments and Indigenous groups that are pertinent to the project and/or Impact Assessment;
- any relevant land use plans, land zoning, or community plans;
- information on land lease agreement or land tenure, when applicable;
- municipal, 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, health, social or economic effects or impacts; and
- required information as specified in section 3.1 of the Canada Energy Regulator's Filing Manual.

- 1.5 Qualifications of individuals preparing the Impact Statement

To ensure transparency and the quality of the scientific information and analysis being applied, the proponent must provide information on the individuals who prepared the sections of the Impact Statement related to environmental, economic, social and health impacts on Indigenous peoples. Proponents are required to demonstrate that a qualified individual has prepared the information or studies provided. A qualified individual would include someone who, through education, experience or knowledge relevant to a particular matter, may be relied upon by the proponent to provide advice within a given area of expertise. Knowledge relevant to a particular matter may include Indigenous and community knowledge.

2. Project description

2.1. Project components

The Impact Statement must describe the designated project, by setting out the project components, associated and ancillary works, and other characteristics to assist in understanding the potential environmental, health, social and economic effects, and impacts on Indigenous peoples and Indigenous rights, as identified by the Indigenous group(s). This description must be supported with maps of key project components, boundaries of the proposed site with geographic coordinates, major existing infrastructure, proponent lands, and properties or leased lands, adjacent resource lease boundaries, adjacent land uses and any important environmental features.

2.1.1. Common project components

- the overall plan of the project components at an appropriate scale, including but not limited to the pipeline's corridors, work and storage areas, compressor stations, metering stations, block valves, control centre, inspection facilities and other related equipment (footprint, dimensions, capacities, pressures, etc.);

- other physical facilities and activities required for the construction of the pipeline, including auxiliary facilities directly related to the project, such as access roads, including temporary and permanent bridges, construction camps and pipe arrangement and storage areas;
- permanent and temporary linear infrastructures such as the pipeline right-of-way, access roads and routes, railways, pipelines, power supply and electrical transmission lines;
- water management infrastructure to divert, control, collect and discharge surface drainage and groundwater seepage to the receiving environment**;**
- diversions/realignments of waterbodies and watercourses;
- waterbody/watercourse crossings, including bridges and culverts;
- construction workspace and laydown areas;
- storage for fuels, explosives and hazardous wastes;
- sources of drinking and industrial water;
- energy supply sources;
- fencing and gates;
- administrative buildings;
- worker's camps;
- borrow pits and quarries;
- fill and backfill (volumes, source, transport, storage and disposal);

2.2. Estimated cost of project

The Impact Statement must provide the estimated amounts of total capital expenditures, additional operating costs and amendments to estimated costs, where applicable, for the following categories:

- pipeline;
- compressors/pumps;
- metering stations and flow regulators;
- storage facilities;
- other facilities;
- allowance for funds used during construction, including rates used;
- capitalized overhead costs, with separate breakdown of major cost components, such as materials, installation, land and land rights.

2.3. Project activities

The Impact Statement must include descriptions of project activities to be carried out during each project phase, the location of each activity and the activity's duration, magnitude and scale.

The Impact Statement must provide a complete list of project activities and focus on activities with the greatest potential to have environmental, health, social and economic effects, or impacts on Indigenous people and Indigenous rights. Sufficient information must be included to adequately

predict positive and adverse effects, the interaction between those effects and any disproportionate effects for diverse subgroups.

Evidence that input from diverse subgroups was sought through engagement activities to identify potential effects or other concerns and issues must be provided. The information must be sufficient to provide an analysis regarding the project's impacts in the context of potential interaction between valued components.

The Impact Statement must highlight activities that involve periods of increased disturbance to environmental, health, social and economic conditions or impacts on Indigenous peoples. It must include a schedule including time of year, frequency, and duration for all project activities.

The 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, Indigenous peoples and the public. Information on project activities must include, where applicable, a description of the elements listed below:

2.3.1. Site preparation and construction

- construction staging, including surveying of right-of-way and work areas;
- excavation of topsoil, soil and bedrock, including potentially acid-generating and metal-leaching materials;
- blasting (frequency, time of year, time of day and methods);
- manufacture, storage, transportation and management of explosives;
- clearing of transmission corridor and construction of powerline to site, where appropriate, as well as construction of temporary and permanent infrastructure (garages, administrative buildings, compressor, measuring and operations control stations, etc.);
- construction of access roads;
- installation of fences and gates;
- changes to existing infrastructure (e.g., relocation of service lines or roads);
- activities (including temporary structures and the use of explosives) affecting the terrestrial, riparian and aquatic environment, including those carried out in intermittent streams and flood prone areas;
- transportation and management of borrow material (source and quantity);
- temporary and permanent areas for stockpiling and storing materials in the right-of-way (e.g., arable topsoil in agricultural areas, etc.);
- transportation of pipeline construction materials, equipment and related infrastructure;
- routing and stringing of pipes in the right-of-way, along the alignment;
- coating of pipeline pipes, if carried out on site;
- excavation of trench, laying of pipe and infilling;

- preparation, installation and burial of pipeline pipes and other underground components, as well as compaction;
- bending, welding, inspection and coating of pipeline welds;
- installation of block valves;
- installation of cathodic protection system to prevent corrosion;
- drilling;
- work related to waterbody or watercourse crossings, temporary or permanent (bridge or culvert);
- crossing of obstacles and waterbodies/watercourses using the appropriate method, including but not limited to trenched (isolated, open-cut, etc.) and trenchless (horizontal directional drilling, microtunneling, etc.) crossings;
- water management, including water diversions, dewatering or deposition activities, and runoff management (location, methods, timing);
- performance and certification of leak tests and hydrostatic tests, including cleaning, filling, drying and final tie-ins;
- water requirements for hydrostatic testing (identification of sources: local waterbodies or other sources for water withdrawal), estimate of quantities needed, management and treatment of wastewater and discharge points;
- operation of light duty, heavy-duty and mobile off-road equipment (type, quantity);
- workers' camps (capacity, drinking water supply, wastewater treatment);
- transportation of employees;
- storage, management and disposal of hazardous materials, fuels and waste (types, methods, quantity);
- as appropriate, performance of sounding to detect and mark existing underground works in or near the right-of-way (pipes, cables, drains, etc.);
- clearing, grubbing, and grading of site, including right-of-way and work areas;
- site restoration (right-of-way, work, stockpiling, storage and other areas reworked during construction work), including, where appropriate, reconnection of drainage systems impacted by construction work, etc.

2.3.2. Operation

- commissioning of pipeline;
- operation of pipeline and other facilities and activities, such as compressor stations;
- operating activities (pumping, metering, storage, transportation, maintenance of the right-of-way, developments and facilities, etc.);inspection and surveillance of the network, including verification of the pipeline's condition and integrity, detection of possible leaks, verification of the cathodic corrosion protection system, etc.;
- maintenance of the right-of-way and maintenance of grass cover to prevent tree regrowth;

- maintenance and, where appropriate, upgrading of aboveground infrastructures and buildings housing them;
- use and maintenance of access roads;
- storage and handling of petroleum products, hazardous materials and waste, as appropriate;
- runoff management at permanent facilities and in material storage and handling areas;
- waste management;
- workforce management, including transportation, work schedules and lodging.

2.3.3. Suspension, abandonment or decommissioning

When reviewing an application for proposed new facilities, the CER only looks at closure and decommissioning activities in a broad context. A separate environmental and socio-economic assessment specific to closure and decommissioning activities may be required at the time the facilities are closed or decommissioned.

For the purposes of the Impact Statement, the proponent should provide information on the following:

- a preliminary plan for the abandonment, decommissioning or reclamation of any components associated with the project;
- ownership, transfer and control of the different project components;
- final site restoration;
- removal of surface contamination from facilities and equipment;
- dismantling and removal of equipment and systems;
- demolition of buildings and ancillary structures;
- remediation of project site;
- long-term care, monitoring and maintaining the integrity of the site and any remaining structures;
- abandonment or decommissioning of temporary or permanent facilities;
- transfer of fuels, hazardous materials and waste to off-site locations.

2.4. Workforce requirements

The Impact Statement must describe the anticipated labour requirements, employee programs and policies, and workforce development opportunities for the designated project, including:

- opportunities for employment outlining the anticipated number of full-time and part-time positions to be created and how this can change during the project;

- anticipated workforce region of origin (i.e. local, regional, out-of-province or international employees);
- the skill and education levels required for the positions;
- investment in training opportunities;
- expected workforce requirements based on the National Occupational Classification system and timelines for employment opportunities;
- working conditions and anticipated work scheduling for construction and operation (e.g., hours of work, rotational schedules, fly-in/fly-out);
- anticipated hiring policies, including hiring programs;
- workplace policies and programs for Indigenous employment, and employment of other underrepresented groups;
- employee assistance programs and benefits programs;
- workplace policies and programs including codes of conduct, workplace safety programs and cultural training programs.

In addition to the above, the analysis of workforce requirements must take GBA+ into consideration. It must specify how hiring policies and programs, access to employment and training opportunities, investment in training and workplace policies and programs take into account vulnerable or underrepresented groups, including Indigenous peoples or other relevant community subgroups (e.g., women, youth, seniors).

3. Project purpose, need and alternatives considered

The proponent must analyze and take into account the need for and alternatives to carrying out the project in its impact statement. The proponent should consult Agency and the CER guidance documents, particularly the guidance document: "Need for", "Purpose of", "Alternatives to" and "Alternative Means" and the policy context document: "Need for", "Purpose of", "Alternatives" and "Alternative Means"

3.1. Purpose of the project

The Impact Statement must outline what is to be achieved by carrying out the project. The statement should broadly classify the project (e.g. pipeline intended for export) and indicate the target market (e.g. international, domestic, local, etc.). The *purpose of statement* should include any objectives the proponent has in carrying out the project. Proponents are encouraged to consider the perspectives of participants (i.e. public, Indigenous peoples, governments) in establishing objectives that relate to the intended effect of the project on society. The proponent must also discuss the possibility that the facilities could be converted in the future to transport products other than natural gas.

3.2. Need for the project

The Impact Statement must describe the underlying opportunity or issue that the project intends to seize or solve and should be described from the perspective of the proponent. In many cases, the need for the project can be described in terms of the demand for a resource. The proponent should provide supporting information that demonstrates the need for a project. The information provided should make it possible to reasonably conclude that there is an opportunity or issue that warrants a response and that the proposed project is an appropriate approach. The proponent may report the comments or views of Indigenous peoples, the public and other participants on the proponent's need statement

Taking into account the current climate context, the proponent must also

- Assess the need for the project, including the validation of the proponent's assumption that gas could replace more polluting energy sources;
- Assess the potential for international markets to significantly reduce their demand for fossil fuel energy in the coming years.

3.3. Alternatives to the project

In addressing alternatives to the project, the Impact Statement must provide a description of the functionally different ways that are technically and economically feasible to meet the stated project need and achieve the project purpose from the perspective of the proponent. For these technically and economically feasible alternatives to the project, the Impact Statement must provide sufficient information for the selection of alternatives to the project. The process of identifying and considering alternatives to the project must consider the views, information and knowledge from Indigenous peoples, the public and other participants, as well as existing studies and reports. The Impact Statement should present a rationale for selecting the proposed project over other options.

In order to be consistent with the Government of Canada's climate change commitments, the proponent must also:

- Assess the options or scenarios in which the purpose of the Gazoduq Project would change, for example, assess a scenario in which there would be a change in the primary client served;
- Assess the possibility of transporting other energy sources.

The analysis of alternatives to the project should serve to validate that the preferred alternative for the project is a reasonable approach to meeting the need and purpose and is consistent with the aims of the IA Act.

3.4. Alternative means of carrying out the project

The Impact Statement must identify and consider the potential environmental, health, social and economic effects of alternative means of carrying out the project that are technically and economically feasible. For example, the selection of the project route is a key element in controlling, avoiding and reducing effects.

The Impact Statement must describe:

- the criteria to determine technical and economic feasibility of possible alternative means;
- the best available technologies considered and applied in determining alternative means;
- each alternative means in sufficient and appropriate detail;
- those alternative means that are technically and economically feasible; and
- in each case, the rationale for the selection of the preferred alternative means.

The Impact Statement must identify the elements of each alternative means and the associated adverse and positive environmental, health, social or economic effects or impacts on Indigenous rights, as identified by Indigenous peoples. The application of Gender Based Analysis Plus (GBA+)[4] to the effects analysis is required to describe disproportionate effects for diverse subgroups, including those identified by age, socioeconomic status or disability. The proponent must also consider the views or information provided by Indigenous peoples, the public and other participants in establishing parameters to compare the alternatives means.

The Impact Statement must then identify:

- the preferred alternative means of carrying out the project based on the consideration of environmental, health, social and economic effects, and of technical and economic feasibility and through the use of best available technologies;
- the methodology and criteria used to analyze and compare the options determined and to justify the preferred alternative means and the unacceptability of excluded alternative means, including consideration of trade-offs associated with the preferred and other alternative means;
- criteria to examine the environmental, health, social and economic effects of each remaining alternative means to identify a preferred alternative.

[4] Gender Based Analysis Plus (GBA+) provides a framework to describe the full scope of potential adverse and positive effects under the IA Act. GBA+ is an analytical framework that guides practitioners, proponents and participants to ask important questions about how designated projects may affect diverse or potentially vulnerable population groups. The Agency's guidance document *Gender-Based Analysis Plus in impact assessment* provides guiding principles to allow promoters to use this analytical framework in their impact statement.

In its alternative means analysis, the proponent must address all elements, including, but not limited to, the following project elements and components, where relevant to the project activities and design:

- route or corridor for the transportation of natural gas;
- route or corridor for electrical transmission lines;
- location of compressor stations, meter stations and other project infrastructure;
- access to the project site;
- location of key project components;
- facility design;
- excavation and drilling methods;
- number and importance of waterbodies and watercourses to be crossed (size, sensitivity, etc.);
- construction and crossing methods for waterbodies, watercourses, wetlands and other obstacles;
- switchyard design;
- energy sources to power the project site and other stationary sources to provide heat or steam to the project;
- management of water supply and discharge sites (hydrostatic test);
- waste management;
- management of excavated materials, including potentially acid-generating or leachable materials;
- disposal of drilling mud and cuttings or produced water;
- water supply management;
- waste water management;
- construction alternatives;
- timing options for various components and phases of the project;
- suspension, abandonment or decommissioning options.

Provide the rationale for the selected construction design and methods. If applicable, describe the other designs and methods assessed and provide the reasons for their elimination. If applicable, the assessment of alternatives should include, but not be limited to, the following elements:

- Any strategic or regional assessment;
- Any study or plan conducted or prepared by a jurisdiction, or an indigenous governing body, related to the area affected by the designated project and provided with respect to the project;
- any relevant assessment of the effects of the designated project that is conducted by or on behalf of an Indigenous governing body and that is provided with respect to the designated project;

- Indigenous knowledge, community knowledge, comments received by the public, comments received from a jurisdiction; and
- other studies or assessments realized by other proponents.

4. Description of public participation and views

The proponent must work with local communities, associations and stakeholders. Engagement activities should prioritize the participation of those most affected by the proposed project, while ensuring that interested members of the public have an opportunity to share their views.

The proponent must identify and consult individuals and communities that have rights or interests on the lands affected by the proposed project. These rights and interests may be affected by:

- the use of one or more current rights of way by the company for the project;
- the acquisition or rental of land;
- the development of temporary work areas, which may be adjacent, or access to these;
- the project's crossing of third-party infrastructures;
- land rights, registered or not;
- regulatory area operating activities.

The proponent must also contact residents, land users and other persons likely to be affected by the proposed project in order to keep them informed. For example:

- persons who may be affected by nuisances (noise, dust, traffic, etc.) resulting from the construction and operation of the proposed facilities;
- persons who have registered or recognized hunting, trapping or guiding areas, as well as recreational and commercial fishing areas;
- users of parks and recreational areas (including local, provincial or territorial parks and areas recognized as scenic);
- persons residing in the emergency planning zone.

4.1. Summary of engagement activities

The Impact Statement must describe the proponent's ongoing and proposed public engagement activities regarding the designated project. The proponent's public engagement strategy will be informed in part by the Public Participation Plan issued by the Agency.

The Impact Statement must 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 Impact Statement must indicate, for example, the methods used, where the consultation was held, the persons, organizations and diverse groups consulted, the views expressed and the extent to which this information was incorporated in the design of the project as well as in the Impact Statement.

4.2. Analysis and response to questions, comments and issues raised

The Impact Statement must provide a summary of key issues related to the project, which were raised through engagement with the public and Indigenous peoples, and the potential environmental, health, social and economic effects, including disproportionate effects, for diverse subgroups within the population. The Impact Statement must describe any questions and comments raised by the public and how they influenced the design, construction or operation of the project. The Impact Statement must identify the alternative means, mitigation measures or the monitoring and follow-up programs identified to deal with public uncertainty.

The Impact Statement should also provide details and commitments regarding how the public will be kept involved if the project were to be approved and were to proceed, such as public involvement in follow-up and monitoring programs. The Impact Statement must identify public concerns that were not addressed, if any, and provide reasons why the concerns were not addressed.

The proponent should refer to Agency guidance on this topic, including Strategic Context: Public Participation and the guidance document: Public Participation in Impact Assessment

5. Description of engagement with Indigenous peoples

5.1. Analysis of potentially affected Indigenous peoples

The Impact Statement must describe the analysis used to identify all Indigenous peoples that may be impacted by the designated project, and provide:

- the list of Indigenous peoples potentially impacted by the project;
- the source of information and analysis used in creating this list;
- a list of potential effects and impacts on environmental, health, social and economic conditions of each Indigenous peoples and the predicted degree (e.g. high, moderate, low) of those effects and impacts;
- the Indigenous rights or interests of each Indigenous peoples, that the groups themselves have identified, that may be impacted by the designated project; and
- the sources of information and analysis used to determine the extent of the potential effects on each Indigenous peoples.

5.2. Record of engagement

The Impact Statement must provide a record of engagement that describes all efforts, successful and unsuccessful, taken to seek the views of each potentially affected Indigenous peoples with respect to the designated project. This record of engagement is to include all engagement activities undertaken

prior to the submission of the Impact Statement during the Planning Phase and in the preparation of the Impact Statement. The Impact Statement must include:

- the list of Indigenous peoples engaged by the proponent, including those which the proponent was unsuccessful in engaging;
- the engagement activities undertaken with each Indigenous peoples, including the date, means and results of engagement;
- a description of efforts to engage diverse populations of each Indigenous peoples in culturally appropriate ways, including groups identified by gender, age or other community relevant factors (e.g. hunters, trappers, and other harvesters) to support the collection of information needed to complete the GBA+; and
- a description of how engagement activities by the proponent were intended to ensure Indigenous peoples were provided an opportunity to evaluate the designated project's potential positive and negative effects and impacts on their members, communities, activities, and Indigenous rights, as identified by the Indigenous peoples.

5.3. Analysis and response to questions, comments and issues raised

The Impact Statement must provide an analysis of the input received from Indigenous peoples with respect to the designated project, as well as a description of how Indigenous peoples reviewed the information contained in the Impact Statement. This analysis is to include all input received by Indigenous peoples prior to, and since commencing the Impact Assessment process. This analysis is to include, and not limited to, the identification of potential effects and impacts, including impacts on Indigenous rights and interests, and the identification of specific VCs where appropriate. If the Indigenous peoples provide specific studies, the proponent is encouraged to attach these as an appendix to the Impact Statement. The proponent is also encouraged to work with Indigenous peoples who demonstrate an interest in drafting sections of the Impact Statement that concern them.

The analysis in the Impact Statement must also include consideration of Indigenous knowledge provided by Indigenous peoples. Indigenous knowledge that is not already publicly available or where written consent has not been provided by the Indigenous group(s) should not be included. Permission from the Indigenous group should be sought before including Indigenous knowledge in the Impact Statement, regardless of the source of the Indigenous knowledge.

Indigenous knowledge is holistic and in IA, it can provide insights related to knowledge of the environment, social, cultural, economic, health, Indigenous governance and resource use. It is important that Indigenous knowledge be included for all of these aspects of the technical assessments, not only to look at potential impacts of the project on Indigenous peoples. Given the holistic nature of Indigenous knowledge, it may be presented in one section of the Impact Statement, rather than being broken down into the technical sections or chapters. It is also

important to capture the context in which Indigenous peoples provide their Indigenous knowledge and to convey it in a culturally appropriate manner.

The Impact Statement must also document how the proponent responded to questions, comments and issues raised by Indigenous peoples, and how unresolved matters have been addressed in the Impact Statement. Any proposed mitigation measures are to be clearly linked, to the extent possible, to VCs in the Impact Statement as well as to project components or activities. The analysis and responses are to include:

- main issues, questions and comments raised during the engagement activities by each Indigenous peoples and the proponent's responses, including how matters have been addressed in the Impact Statement or will be addressed through the Impact Assessment;
- future planned engagement activities, and if none are planned, rationale for not undertaking future engagement activities;
- where and how Indigenous peoples' perspectives and input were integrated into or contributed to decisions regarding the project (e.g. project design), including:
  - development and collection of baseline information;
  - plans for construction, operation, decommissioning, abandonment, and maintenance; and
  - follow-up and monitoring;
- where and how Indigenous peoples' perspectives and input were integrated in the characterization of the nature of environmental, health, social and economic effects and impacts expected from the project for each Indigenous peoples;
- where and how Indigenous peoples' perspectives and Indigenous knowledge and input were integrated in avoiding, mitigating or accommodating identified effects and impacts; and
- where potential impacts on Indigenous rights or interests are identified, provide a description of how each potential impact would be avoided, managed, mitigated, or otherwise accommodated (and provide this information for each Indigenous people separately).

The proponent should refer to Agency guidance on this topic, including the following documents : Policy Context: Indigenous Participation in Impact Assesment, Guidance document: Policy Context : Indigenous Participation in Impact Assesment, Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples, Guidance Document: Assessment of Potential Impacts on the Rights of Indigenous Peoples et the Guidance Document: Collaboration with Indigenous Peoples in Impact Assessments.

6. Direction on the conduct of the Impact Assessment

6.1. Defining the baseline conditions

The Impact Statement must provide a description of the environmental, health, social and economic setting directly and incidentally related to the designated project. This should include the existing environmental, health, social and economic components, interrelations and interactions as well as the variability in these components, processes and interactions over time scales and geographic boundaries appropriate to the project, including taking into account the variability due to a possible climate change in the future. Meaningful dialogue with communities and Indigenous peoples provides input that may describe how these components and processes are interrelated.

The information describing the existing baseline conditions may be provided as a stand-alone chapter in the Impact Statement or integrated into clearly defined sections for relevant VCs, including effects assessment of each VC and VC interactions, identification of mitigation measures, residual effects analysis and cumulative effects assessment.

The application of GBA+ to these baseline descriptions to disaggregate and specify baseline conditions for diverse subgroups is necessary to support the GBA+ of effects. The application of GBA+ to the baseline conditions should not be limited to simple descriptions from disaggregate data to analyze the potential positive effects or impacts. Qualitative and quantitative data may be required to describe the baseline conditions for the subgroups.

In describing the biophysical environment, the Impact Statement must take an ecosystem approach that considers how the project may affect the structure and functioning of biotic and abiotic components with the ecosystem using scientific, community and Indigenous knowledge regarding ecosystem health and integrity, as applicable. The Impact Statement must provide a description of the indicators and measures used to determine ecosystem health and integrity as reflected in the TIS Guidelines. The presence of endangered ecosystems potentially affected by the designated project should be included the description of the biophysical baseline conditions.

The Impact Statement must consider the resilience of relevant species populations, communities and associated habitats to the effects of the project. Ecological processes should be evaluated for potential susceptibility to adverse effects from the project. Considerations include: patterns and connectivity of habitat patches; continuation of key natural disturbance regimes; structural complexity; nutrient cycling; abiotic-biotic and biotic interactions; population dynamics and genetic diversity; Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.

If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be

described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional study areas.

The Impact Statement must establish appropriate study area boundaries to describe the baseline conditions. The study area boundaries need to encompass the spatial boundaries of the project including any associated project components or activities, and the anticipated boundaries of the project effects. Since spatial boundaries may vary according the biophysical and socioeconomic elements being studied, the study area may also vary. Considerations in assigning appropriate study areas or boundaries would include, but not be limited to:

- areas potentially impacted by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters;
- areas potentially impacted by airborne emissions or odours;
- areas determined by dispersion and deposition modelling;
- areas within the range of vision, light and sound and the locations and characteristics of the receptors, including the most sensitive receptors[5];
- terrestrial and aquatic species habitats likely to be directly or indirectly affected, usage timing and migratory patterns;
- emergency planning and emergency response zones;
- the geographic extent of local and regional services;
- any affected communities;
- all potentially affected Indigenous peoples;
- areas of known Indigenous land, cultural, spiritual and resource use; and
- existing affected infrastructure.

The information requirements for baseline data are detailed in Sections 7-11.

6.1.1. Sources of baseline information

Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of:

- Environment and Climate Change Canada
- field studies, including site-specific survey methods (including test fisheries);
- database searches, including federal, provincial, territorial and local data banks:

[5] The most sensitive receptors may include, but not be limited to, residences, health and social services institutions (hospitals, long-term care facilities, seniors' residences, etc.), educational institutions (schools, daycare centres, early childhood centres, etc.), tourism establishments (tourism information offices, museums, ski areas, summer camps, outdoor recreation areas, camp sites, etc.) and recreational areas (recreational land, urban parks, parks and conservation areas, etc.).

- Atlas of the Breeding Birds of Ontario (2001-2005): http://www.birdsontario.org/atlas/maps.jsp?lang=en
- Québec Breeding Bird Atlas (2010-2014):
- https://www.atlas-oiseaux.qc.ca/index_en.jsp

- Other monitoring program databases:
  - eBird: https://ebird.org/canada/home
  - Breeding Bird Survey (BBS): https://wildlife-species.canada.ca/breeding-bird-survey-results
  - Christmas bird count: http://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx
  - Birds Studies Canada's Canadian Migration Monitoring Network: https://www.oiseauxcanada.org/volunteer/cmmn/?lang=EN
  - NatureCounts: https://www.birdscanada.org/birdmon/default/searchquery.jsp
  - iNaturalist: https://www.inaturalist.org/
  - Suivi des populations d'oiseaux en péril (SOS-POP): https://quebecoiseaux.org/index.php/fr/dossiers/suivi-des-populations/728-suivi-des-especes-en-peril
  - Atlas of Amphibians and Reptiles of Quebec (ARRQ): https://www.atlasamphibiensreptiles.qc.ca/wp/
  - Neighbourhood Bat Watch: https://batwatch.ca/

- protected areas, watershed or coastal management plans;
- natural resource management plans;
- species recovery and restoration plans;
- field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape);
- land cover data:
  - terrestrial ecosystem mapping products,
  - forest cover maps,
  - remote sensing information,
  - habitats and important characteristics to be included:
    - – waterbodies, wetlands and watercourses
    - – riparian habitat
    - – banks and other eroded habitats
    - – artificial water sources
    - – forests, tracts of trees, single trees (particularly old decaying trees and/or snags)
    - – forest edges and rows of trees
    - – ridges, including eskers
    - – caves and mines
    - – cliffs, rock outcrops, exposed bedrock, talus and other karst topography

– buildings, bridges and other anthropogenic features, including linear features (e.g. roads, electrical transmission lines)
– artificial light sources that attract insects
– critical habitat as described in the recovery programs, for example
– any other habitat characteristics recognized as important in the area;

- specialized publications;
- environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area;
- regional studies, project assessments and strategic assessments;
- renewable harvest data;
- Indigenous knowledge, including oral histories;
- expert, community, public and Indigenous engagement and consultation activities, including workshops, meetings, open houses, surveys;
- qualitative information gathered from interviews, focus groups or observation;
- census data;
- health impact assessments (HIA);
- toxicological human health risk assessments (HHRA);
- community and regional economic profiles;
- statistical surveys, as applicable.
- the governments of Quebec (Ministère des Forêts, de la Faune et des Parcs [MFFP]) and Ontario (Ministry of the Environment, Conservation and Parks [MECP]);
  - Centre de données sur le patrimoine naturel du Québec (CDPNQ): https://cdpnq.gouv.qc.ca/
  - Ontario (Natural Heritage Information Centre): https://www.ontario.ca/page/natural-heritage-information-centre;
  - Species at risk guides and resources (includes a number of best management practices): https://www.ontario.ca/page/species-risk-guides-and-resources;
- Bird Conservation Region (BCR) Strategies:https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies.html
- academic institutions.

As data directly relevant to the study areas may be limited, in addition to data from some existing periodic enumeration programs (e.g., BBS, Ebird, American black duck survey), existing sources of information should be used only to estimate species likely to be found in the study areas and to determine potential migration dates (for migratory species) or general breeding dates (for those that breed in the study area).

If existing data sources are used, justification must be provided for their relevance with respect to the spatial and temporal coverage of the project.

Contact provincial or local authorities to determine relevant information sources and inventory methodology, in addition to the other recommendations in this document.

Consult the Species at Risk Public Registry and available recovery documents to obtain information on the list of species at risk and their protection status, and reference documents and dates consulted. Ensure that the most up-to-date documents have been used and that the species status is up to date in accordance with the Species at Risk Public Registry.

Field surveys must be planned to include several sampling stations and several visits to each station to support all the assessment analyses required. The use of existing data should be limited, and they should be used as supplements to the new data. The surveys and the analyses should be carried out by qualified experts.

The baseline data must be collected in a way that makes possible analyses, extrapolations and reliable predictions. The collated data should make it possible to carry out analyses to estimate pre-project baseline conditions, predict impacts, assess and compare post-project conditions, all at the scale of the project, and the local and regional assessment areas. Modelling methods, error estimates and hypotheses should be presented. The modelling and simulations should be used at the beginning of the planning phase to assess the sampling effort required and determine quantitatively the effectiveness of design options.

The Impact Statement provides detailed descriptions of data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected.

6.2. Selection of valued components (VCs)

The Impact Statement describes the valued components, processes and interactions that are deemed to be of concern or likely to be affected by the designated project.

The Impact Statement must indicate to whom these concerns are important (e.g. the public, FAs or Indigenous groups) and the reasons why, including environmental, Indigenous, cultural, historical, social, economic, recreational, aesthetic considerations, and Indigenous traditional knowledge. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. VCs to be included in the TIS Guidelines will be, in part, based on what communities and Indigenous groups identify as valuable to them in the planning phase.

Accordingly, the Impact Statement must provide the rationale for selecting specific VCs and for excluding any VCs or information specified in the TIS Guidelines. The priority in selecting VCs to be

included and assessed should be project-specific and focused on appropriateness, not influenced by the quantity of information available or the use of the VCs in other assessments.

In selecting a VC to be included, the following factors should be considered:

- VC presence in the study area;
- the extent to which the effects of the designated project and related activities have the potential to interact with the VC;
- The extent to which the VC may be affected by other past, current or future projects in combination with other human activities and natural processes;
- the extent to which the VC is linked to Indigenous interests or rights and whether an Indigenous group has requested the VC;
- the extent to which the VC is linked to federal, provincial, territorial or municipal government priorities;
- information from any ongoing or completed regional assessment processes;
- the possibility that an adverse effect on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments;
- whether the potential effects of the project on the VC can be measured and/or monitored or would be better ascertained through the analysis of a proxy VC.

The VCs must be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential adverse and positive environmental, health, social and economic effects and impacts arising from the designated project activities.

Each species at risks[6] must be considered separately as a VC (including, but not limited to, wolverine, boreal caribou, little brown myotis, Northern myotis, Tri-coloured bat, wood turtle, Blanding's Turtle, snapping turtle, etc.).

6.3. Establishment of spatial and temporal boundaries

The spatial and temporal boundaries determined and established for the IA will vary depending on the VC and are considered separately for each VC, including VCs related to the environmental, health, social and economic conditions of Indigenous peoples, or other potential effects and impacts referred to above.

The Impact Statement must:

[6] Note that, in all following sections, bird species at risk are included in the bird sections, and the information concerning them is not repeated in the species at risk sections.

- describe the spatial boundaries, including local and regional study areas, for each VC included in assessing the potential adverse and positive environmental, health, social and economic effects of the designated project and provide a rationale for each boundary.
- define spatial boundaries by taking into account the appropriate scale and spatial extent of potential effects and impacts (direct and indirect) of the project; community knowledge and Indigenous traditional knowledge; current or traditional land and resource use by Indigenous groups; rights of Indigenous peoples, including cultural and spiritual practices; and physical, ecological, technical, social, health, economic and cultural considerations.
- take into account the size, nature and location of past, present and foreseeable projects and activities are factors included in the definition of spatial boundaries.

It should be noted that in some cases, spatial boundaries may extend to areas outside of Canada. These trans-border spatial boundaries should be identified where transboundary effects are expected.

For VCs associated with wetlands, eskers, birds and wildlife, including species at risk, three spatial boundaries of study areas must be established to assess the impacts on each VC:

1. Project Area (PA): defined as the project footprint, including all temporary and permanent areas associated with the project;
2. Local Study Area (LSA): defined for each – see below;
3. Regional Study Area (RSA): defined for each – see below.

The spatial boundaries for the PA, LSA and RSA should be defined using an ecosystem-centered approach in particular because of the presence of components such as wetlands and eskers that are likely to be affected by the project. The boundaries of ecoregions or derivatives should not be used, since the project will take place within, near or beyond the boundaries of ecoregions. See document *Technical Guidance for Assessing Cumulative Environmental Effects under the* Canadian Environmental Assessment Act, 2012 for more information on establishing spatial boundaries (https://www.ceaa-acee.gc.ca/Content/B/8/2/B82352FF-95F5-45F4-B7E2-B4ED27D809CB/Cumulative_Environmental_Effects-Technical_Guidance-Dec2014-eng.pdf)

Define the spatial boundaries (i.e. of the PA, LSA to the RSA) to meet the following objectives:

1. The diversity of land cover types should be representative of that of the defined spatial extent;
2. The spatial profile of land cover types should be well distributed in the defined spatial extent (e.g. change the spatial boundaries if one or more land cover types are concentrated in a sub-area and are uncommon in other parts of the region);
3. A low to moderate rate of change of the predominance of one or more land cover types based on an increasing distance with respect to the PA (i.e. use the distribution of land cover types to limit the distances within which comparisons must be made).

Note: For wildlife other than migratory birds, contact provincial or local authorities to verify the appropriate spatial boundaries concerning wildlife.

- Wolverine: The LSA should be at least: PA + 10-km buffer zone; simulation modelling could indicate a larger buffer zone.
- Bats: The LSA should be at least: PA + 1-km buffer zone; simulation modelling could indicate a larger buffer zone.
- Caribou: The LSA should be at least: PA + 10 to 40-km buffer zone; simulation modelling could indicate a larger buffer zone. In addition to assessing the project and the cumulative effects at the level of the three project study areas (defined above), the project must also be assessed at the level of the federal range of the Val d'Or boreal caribou population (QC-1).

The temporal boundaries of the IA span all phases of the designated project determined to be within the IA. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries.

For VCs associated with wetlands, eskers, birds and wildlife, including species at risk, the temporal boundaries are defined to allow for the detection of all species that use the PA, LSA and RSA during the year and from one year to another, and to estimate their temporal use pattern (e.g. reproduction or stopover for individuals migrating north or south). Temporal boundaries with a duration of over one year will enable variation due to irregular events to be considered (e.g. mast events, storms during migrations, late snowfalls, etc.).

In order to assess a project's contribution to sustainability, consideration should be given to the long-term effects on the well-being of present and future generations.

6.4. Effects assessment

The Impact Statement must describe in detail the project's potential adverse and positive effects in relation to each phase of the designated project (construction, operation, maintenance, decommissioning, and abandonment). If the details cannot be provided (e.g. for future events such as a closure), a rationale must be provided for the absence of details, as well as a more general description of the expected activities and effects. The environmental, health, social or economic effects may be described in terms of the context, magnitude, geographic extent, ecological context timing, duration and frequency, and whether effects are reversible or irreversible. The spatial scoping of the assessment will vary depending on the VC and should be consistent with the spatial boundaries that were established for baseline data collection. If there is an ongoing or completed regional assessment in the proposed project area, the proponent should use the information generated through that process to inform the effects assessment. As applicable, the effects assessment must be sufficiently disaggregated and analysed to support the analysis of disproportionate effects as per the GBA+.

The assessment of the effects of each of the project components and physical activities, in all phases, must be based upon a comparison of baseline environmental, health, social and economic conditions and the predicted future conditions with the project and the predicted future conditions without the project. Predictions must be made on clearly stated assumptions and the Impact Statement must clearly describe how it has tested each assumption.

The description of the effect can be either qualitative or quantitative. Effects must be described using criteria to quantify or qualify adverse effects, taking into account any important contextual factors. As much as possible, quantitative analysis is preferred. With respect to quantitative models and predictions, the Impact Statement must detail the model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained. For other effects, it may be more appropriate to use other criteria, such as the nature of the effects, directionality, causation and probability. The effects assessment should also set out the probability or likelihood of that effect occurring and describe the degree of scientific uncertainty related to the data and methods used.

Effects may affect the communities and stakeholders in different ways, and therefore they may respond differently to them. Characterizing effects should be based largely on the level of concern expressed through engagement with the affected Indigenous groups and community members. There are tools that can assist with these predictions and analyses, including multi-criteria analysis, risk assessment, modelling, in addition to seeking out expert and stakeholder input. Effects should be characterized using language most appropriate for the effect (e.g. impacts on rights of Indigenous peoples and social effects may be described differently from biophysical effects).

The assessment of effects, should take into account interactions between the project and past, present and reasonably foreseeable physical activities to be carried out, as described in section 20, *Cumulative effects assessment*.

6.5. Interactions between effects and VCs

Although the requirements set out in these guidelines are separated by environmental, health, social or economic conditions and elements, the Impact Statement must consider and describe the interactions between the environmental, health, social and economic effects, as well as the interaction and interconnectedness of selected VCs taking into account community values.

For example, an adverse environmental effect on water could also have an adverse effect on human health. That same adverse environmental effect on the physical component, water, could result in an adverse environmental effect on the biological component fish, that could in turn, have an adverse social effect on fishing and/or an adverse economic effect on an outfitter that provides guiding services. Alternatively, this pathway could also be impacted by a positive effect on water (e.g. in remediation-related projects). Considering and describing effects holistically, both positive and

negative, requires taking a systems approach that considers interactions between VCs and with other environmental, health, social and economic factors.

6.6. Description of mitigation measure

Every IA conducted under the *Impact Assessment Act* must identify measures that are technically and economically feasible and that would mitigate any adverse environmental, health, social and economic effects of the designated project. Conversely, the proponent must identify enhancement measures to increase positive effects. Under the IA Act, mitigation measures include measures to eliminate, reduce, control or offset the adverse effects of a designated project, and include restitution for any damage caused by those effects through replacement, restoration, compensation or other means. Measures to enhance positive project effects may include skills training, local procurement strategies, investments in community infrastructure (e.g. roads, services). Measures are to be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation.

For more information, see section 18, Mitigation and Enhancement Measures.

6.7. Description of residual effects after mitigation

After considering the consequences of technically and economically feasible mitigation measures, the Impact Statement must describe any residual environmental, health, social or economic effects of the designated project and whether those effects would occur in the local or regional study area. This includes consideration of both positive and negative effects (both direct and indirect) of the project and input received from the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities (FAs) and other interested parties. If an Indigenous group identifies that there are residual effects to rights or interests, those effects should be carried through for residual effects analysis. Where appropriate, information regarding residual effects should be disaggregated by sex, age and other community relevant identity factors to identify disproportionate residual effects for diverse subgroups as per the GBA+.

Proponents must describe the extent to which residual effects are adverse. Where relevant, or where best practice or evidence-based thresholds exist, effects should be described using criteria to quantify adverse effects. This includes criteria such as whether the effects are high or low in magnitude, the geographical extent, timing, frequency, duration and reversibility of the effects, taking into account any important contextual factors.

In addition, effects should be characterized using language most appropriate for the effect (for example impacts on rights of Indigenous peoples and social effects may be described differently from biophysical effects). The description of the impact can be either qualitative or quantitative. For other effects, it may be more appropriate to use other criteria, such as the nature of the effects, directionality, causation and probability.

Impacts may affect the communities and stakeholders in different ways, and therefore they may respond differently to them. Characterizing effects should be based largely on the level of concern expressed through engaging with the affected Indigenous groups and community members. There are tools that can assist with these predictions and analyses, including multi-criteria analysis, risk assessment and modelling, in addition to seeking out expert and stakeholder input. For more information, refer to Section 19, *Residual effects*.

6.8. Cumulative effects assessment

The proponent must identify and assess the designated project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative environmental, health, social and economic effects. If there is an ongoing or completed regional assessment in the proposed project area, the proponent should use the information generated through that process to inform the cumulative effects assessment.

Cumulative effects are defined as changes to the environment, health, social and economic conditions as a result of the project's residual environmental, health, social and economic effects combined with the existence of other past, present and reasonably foreseeable physical activities, as well as within activities of the project itself from multiple emissions and discharges (e.g. simultaneous operations) to understand synergistic or additive effects.

Cumulative effects may result if:

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

A cumulative effect on an environmental, health, social or economic component may be important even if the project's effects to this component by themselves are minor. The Impact Statement must define and prioritize the list of VCs on which the cumulative effects assessment must focus and also substantiates the rationale for the final selection. Finalizing the choice of VCs and the appropriate boundaries, including potential transboundary areas, to assess cumulative effects, must be informed through consultation with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities (FAs) and other interested parties.

The cumulative effects assessment must include consideration of cumulative effects to rights of Indigenous peoples and cultures. Both the content and means of presenting this information is to be developed in consultation with each potentially impacted Indigenous group. Proponents are encouraged to collaborate with Indigenous groups in the cumulative effects assessment. Where Indigenous groups do not wish to participate in the cumulative effects assessment with the proponent, the proponent is to share a preliminary draft of the cumulative effects assessment on an

Indigenous group's rights and culture with them in order to receive feedback prior to submitting the Impact Statement to the Agency.

For more information, please see section 0, *20. Cumulative Effects* Assessment.

7. Baseline conditions — Biophysical environment

The Impact Statement must provide a clear description of the baseline studies, document reviews and fieldwork that have been conducted; the rationale for any limits to these studies, reviews and fieldwork; and a justification of the adequacy of these studies, reviews and fieldwork.

The list of elements, in the existing biophysical environment, that could be recognized as VCs and that would require a detailed baseline description in the Impact Statement, is detailed in this section.

Where baseline data are available in GIS format, this information is to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard. This would support the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Agency's Registry and Internet Site and the Government's Open Science and Data Platform.

7.1. Atmospheric, acoustic and visual environment quality

The EIS must:

- Assess the ambient air quality in the project study areas and identify existing emissions and contaminant sources. The description and assessment of background concentrations and existing deposits of contaminants may be carried out in various ways (e.g. using long-term or short-term monitoring data, using the air quality of representative areas or using results obtained from air quality models).
- Provide baseline survey results on air quality, in particular near sensitive receptors. These must address at least the following potential contaminants: total suspended particulates, fine particulates smaller than 2.5 microns (PM2.5), respirable particulates of less than 10 microns (PM10), carbon monoxide (CO), ozone, sulphur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOC), hydrogen sulphide (H2S), and any other toxic atmospheric pollutants from mobile, stationary or fugitive sources (e.g. diesel particulate matter, metals, polycyclic aromatic hydrocarbons (PAH)).
- For air pollutants with standards (e.g. Canadian Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Objectives (NAAQO)), the air quality criteria of the Ministère de l'environnement et de la lutte contre les changements climatiques du Québec, or Ontario Ambient Air Quality Criteria (OAAQC)), use the averaging period and the statistical format associated with each numerical value;

- Consider seasonal variability in the baseline survey at key receptors (e.g. traditional land use locations, sensitive human receptors such as schools, hospitals, community centres, retirement homes or care centres) using complete, exhaustive and representative monitoring data over a duration (based on multi-year data) and a geographic scope appropriate for the determination of ambient concentrations of contaminants. Data validation and quality control must also be described;
- Describe current ambient noise levels at key receptor points (e.g. Indigenous groups or communities), including the results of a baseline ambient noise survey and permissible noise levels for each receptor. The information on usual noise sources, their geographic extent and temporal variations must be included;
- Provide information on all noise sensitive receptors in the study area, including any foreseeable potential receptor and the distance between the receptors and the project;
- Ensure that the data are representative of site conditions; if surrogate data from reference sites are used rather than specific measurements at the project site, show how the data are representative of the site conditions.

Health Canada guidelines regarding appropriate baseline information for air quality and noise are presented in the Referenced documents – Pat 2 section.

The Impact Statement must:

- existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons.

The proponent should refer to the Health Canada guides, “Evaluating Human Health Impacts in Environmental Assessment: Noise” and “Evaluating Human Health Impacts in Environmental Assessment: Air Quality” (see complete references in Part 2 – Cited Texts) to make sure they provide the information and analyses Health Canada considers necessary to evaluate project impacts on human health associated with the changes in ambient noise and air quality. The proponent is asked to complete the checklists provided in these guides (Appendix B in the guide on noise and Appendix A in the guide on air quality) to assist Health Canada and other participants in verifying whether the key elements of an evaluation of noise or air quality impacts are completed and to identify the location of this information in the Impact Statement. These checklists will facilitate Health Canada’s review of the Impact Study and will be particularly useful if the analyses on these aspects are in several sections of the Impact Study.

7.2. Meteorological environment

The EIS should:

- describe the local and regional climate including historical records of relevant meteorological information (e.g. total precipitation (rain and snow));
- provide mean, maximum and minimum temperatures;
- provide typical wind speed and direction;
- identify the potential for extreme weather events such as, wind, precipitation and temperature extremes.

7.3. Geology, geochemistry and geological hazards

The EIS should:

- Describe the bedrock geology, including a table of geological descriptions, geological maps and cross-sections at the appropriate scale, including geospatial data files (e.g. shapefile or kml);
- geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
- identify any areas with potential for acid-generating rock and provide geochemical characterization of potential for metal leaching and acid rock drainage, including oxidation of primary sulphides and secondary soluble sulphate minerals, as applicable. This description should include major and trace elements;
- identify any geological hazards that exist in the areas planned for the project facilities and infrastructure, including:
- history of seismic activity in the area, including induced earthquakes, and secondary effects such as the risk of seismic generated tsunamis, landslides and liquefaction;
- evidence of active faults;
- isostatic rise or subsidence;
- describe potential impacts of seismic events, specifying the probability of occurrence used in the analysis (e.g. 2% over the next 2500 years) as well as the best practice codes and guides that are or will be used in the seismic effects analysis (e.g. National Building Code of Canada 2015, CAN/CSA-Z662 standard):
- history of landslides, slope erosion and the potential for ground and rock instability/landslides, and subsidence during and following project activities.
- provide a characterization of the geochemical composition of expected materials to be excavated or blasted such as waste rocks. This characterization should include major and trace elements and potential for acid generation.

7.4. Topography, soil and sediment

The impact study must:

- describe the general topography of the project zone and all the specific physical characteristics the project will pass through or that might affect the project;
- identify potential wind or water erosion zones;
- describe the terrain, sediment and soil in the project's local and regional zones, including sediment stratigraphy, surficial geology maps and cross-sections of appropriate scale;
- identify any areas of ground instability;
- provide maps depicting soil depth by horizon and soil order within the pipeline site area to support soil salvage and reclamation efforts and to outline the potential for soil erosion;
- describe the suitability of topsoil and overburden for use in the reclamation of disturbed areas, including an assessment of the acid generating potential of overburden to be used.
- for agricultural lands or forested lands with agricultural capability describe:
    - the soil classification, including the order, group, family, series and type of soil prior to construction, and quantify the soil classification;
    - the productivity of land and the type of agricultural resource;
    - the soil types in the study area highly susceptible to: wind and erosion, soil compaction and loss of structure and tilth;
    - any other soil types needing specific management of mitigation measures;
    - soil conservation and protection measures.
- describe the historical land use and the potential for contamination of soils and sediments and describe any known or suspected soil contamination with the study area that could be re-suspended, released or otherwise disturbed as a result of the project.

7.5. Riparian and wetland environments

The impact study must:

- provide pre-project characterization of the shoreline, banks, current and future flood risk areas, wetland catchment boundaries;
- quantify, delineate and describe wetlands (fens, marshes, peat lands, bogs, etc.) within the local study area potentially directly, indirectly and/or cumulatively affected by the project in the context of:
    - wetland class, ecological community type and conservation status;
    - biodiversity;
    - abundance at local, regional and provincial scales;
    - distribution;
    - current level of disturbance.
- provide the Agency with GIS files of mapped features depicting natural areas and wildlife presence within the study area;
- identify, map and categorize all wetlands potentially directly or indirectly affected by the project. Identify wetlands on federal land and all those within the scope of federal government authorizations (permits or other) or others;

- determine whether these wetlands are within a geographic area of Canada where wetland loss or degradation has reached critical levels, or whether they are considered ecologically or socially or economically important to a region;
- identify and describe wetland capacities to perform hydrological and water quality functions, provide for wildlife and wildlife habitat or other ecological functions;
- provide a wetland functions assessment in accordance with the guiding principles of *Wetland Ecological Functions Assessment: An Overview of Approaches* or any subsequent approved guidelines by which to determine the most appropriate functions assessment methodology to use (see Referenced Documents – Part 2 section);
- the assessment should be conducted prior to project construction for all wetlands directly affected by the project and for all hydrologically related wetlands. As part of this assessment, the proponent must ensure that wetlands are taken into account in the context of:
- major watersheds of which they are a part;
- the use of adjoining land, with an emphasis on hydrology and other functions;
- the terrain and/or watershed, taking into account topography, soil types and hydrologic connections.
- the assessment shall be quantitative and include the collection of baseline information on the functions of the wetlands specific to the site, including:
    - surveys aimed at determining the presence, abundance, density and distribution of migratory birds, species at risk under listed under the Species at Risk Act (SRA), the Endangered Species Act (ESA, Ontario) and the Act Respecting Threatened or Vulnerable Species (ARTVS, Quebec) and species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being endangered as these relate to potentially impacted wetlands and related riparian areas. Surveys must comply with established standards (see sections 7.10, 7.11 and 7.12), be specific to one species or group of birds, and be conducted during appropriate times of year, as specified in section 7.10-12 of this document. Whenever possible, surveys of species at risk should focus on each species individually (generally speaking, an indicator-based approach is not suitable for species at risk). Surveys should not be limited to wetland-obligate species or groups of species; rather, they should include all species known to frequent wetland habitats as part of their life cycle. Data should be sufficiently reliable to make it possible to identify the wetland classes important to each species (and how many thereof);
    - spatial location and a description of the biological characteristics of each potentially impacted wetland, as well as the ecological functions (hydrologic properties, biochemical cycle, habitat, climate) each one performs. ECCC recommends carrying out as accurate an assessment as possible of the wetland's biological characteristics and the ecological functions it performs;

    - a justification and detailed description of the methodology used to conduct the wetland functions assessment;
    - complete sets of data for all project sites, including GIS files; databases and GIS files must be accompanied by detailed metadata compliant with ECCC metadata standards (ISO 19115 NAP) https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=16553.
- communicate with provincial or local authorities to determine potential application of other wetland conservation policies, regulations and guidelines (see the Wetland Network website at http://www.wetlandnetwork.ca/index.php?g_int_AppLanguageId=1&);
- determine a sufficiently large regional survey zone to capture the effects of wetlands on the broader drainage area and include wetlands located outside the local study area that might be affected by hydrologic changes stemming from cumulative impacts.

7.6. Groundwater and surface water

Requirements for the characterization of groundwater and surface water baseline conditions in an Impact Statement will vary depending on the type of project. They will be commensurate in emphasis and detail with potential effects on groundwater and on surface water. Requirements listed here are in a sequence corresponding to the steps of a generic, coupled, groundwater–surface water characterization study.

The Impact Statement must

- provide hydrometeorological (temperature, precipitation, evapotranspiration) information based on data from nearby weather stations or from a weather station on site if required;
- describe and illustrate on one or more topographic maps, at appropriate scales, the drainage areas throughout the pipeline right-of-way; identify all water bodies and watercourses, including intermittent streams, flood plains and wetlands, watershed and sub-watershed boundaries; and indicate the intended locations of pipeline crossings of water bodies or watercourses;
- for each water body and watercourse potentially affected by the project, provide the timing of freeze-thaw cycles, ice cover and ice conditions for the water bodies and watercourses in the project area;
- predict, for each water body and watercourse potentially affected by the project, the bathymetry, maximum and mean depths, and type of substrate (sediments);
- Provide a delineation and characterization of groundwater–surface water interactions, including an identification of groundwater-dependent ecosystems, wetlands, and recharge and discharge areas;
- identify all springs and any other potable surface water resources within the local and regional project areas and describe their current use, potential for future use, and whether their consumption has Indigenous cultural importance;

- describe, for each water body and watercourse potentially affected by the project, the surface water quality baseline characterization program, including sampling site selection, monitoring duration and frequency, sampling protocol, and analytical protocol, including quality assurance and quality control measures;
- provide baseline surface water quality data for physicochemical parameters (temperature, pH, electrical conductivity, dissolved oxygen, turbidity, radionuclides, nutrients, and organic compounds, including those of potential concern); additional data may be required to illustrate the seasonal and inter-annual variability in baseline surface water quality, including possible changes due to groundwater–surface water interactions;
- ensure that the data are representative of site conditions; if surrogate data from reference sites are used rather than project-specific measurements, demonstrate how the data are representative of site conditions;
- identify all domestic, communal or municipal water wells within the local and regional project areas, including their piezometric level; describe their current use, potential for future use, and whether their consumption has any Indigenous cultural importance;
- identify all groundwater monitoring wells within the project area, including their location and groundwater quality information;
- provide monitoring well hydrographs showing the full range of seasonal and inter-annual water level variations;
- describe the groundwater quality baseline characterization program including sampling site selection, monitoring duration and frequency, sampling protocol, and analytical protocol including quality assurance and quality control measures;
- provide baseline groundwater quality data for physicochemical parameters (temperature, pH, electrical conductivity, dissolved oxygen, turbidity) and relevant chemical constituents (major and minor ions, trace metals, radionuclides, nutrients, and organic compounds, including those of potential concern); additional data may be required to illustrate the seasonal and inter-annual variability in baseline groundwater quality, including possible changes due to groundwater–surface water interactions;
- describe the hydrostratigraphic units (aquifers, aquitards, aquicludes) of the hydrogeological environment in the bedrock;
- describe the structural geology of the hydrogeological environment, including major faults, fracture density and orientation with respect to groundwater flow directions;
- describe the groundwater flow boundaries of the hydrogeological environment for the purposes of the Impact Statement;
- provide the hydraulic properties of the hydrostratigraphic units, including data on hydraulic conductivity, specific storage, transmissivity, storativity, saturated thickness, porosity, and specific yield, as applicable;

- provide hydrogeological maps and cross-sections of the study area showing water table elevations, potentiometric contours, interpreted groundwater flow directions, groundwater divides and areas of recharge and discharge;
- present a conceptual model of the hydrogeological environment, including a discussion of geomorphic, hydrostratigraphic, hydrologic, climatic, and anthropogenic controls on groundwater flow;
- develop a 3-dimensional numerical groundwater flow model for the project area based on the conceptual model of the hydrogeological environment;
- state limitations and assumptions in the modelling approach;
- calibrate the numerical model to baseline hydrogeological conditions using groundwater level and stream flow monitoring data; and provide metrics and graphs describing the quality of the calibration that was achieved;
- analyse the sensitivity of key model outputs to hydraulic properties and climatic parameters such as recharge; and
- using the calibrated numerical model, provide a baseline groundwater budget including baseflow discharge to wetlands, streams and rivers, recharge from lakes or streams, and any anthropogenic withdrawals.

The proponent should refer to the Health Canada guide *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality* to ensure that all the information and analyses are provided that Health Canada considers necessary to assess the project's impacts on human health in relation to changes in water quality. The proponent should complete the checklist in this guide (Appendix A) to assist Health Canada and other participants in verifying that the main components of a water quality impact assessment have been completed and to identify the location of this information in the Impact Statement. The checklist will make it easier for Health Canada to review the Impact Statement, and it will be particularly helpful if analyses on this aspect are found in multiple sections of the Impact Statement.

7.7. Vegetation

The Impact Statement must:

- within the local study area of the project, provide a description of:
  - the biodiversity, relative abundance and distribution of vegetation species and communities of ecological, economic or human importance (e.g. traditional use, tame pasture, native prairie, wetland or old growth);
  - the conservation status (i.e. listed under SARA or assessed by COSEWIC to be 'at risk', including species of concern) applicable to any particular species or communities;
  - the species critical habitat as described in final or draft recovery strategies or action plans, potential critical habitat and any identified habitat of particular importance containing species that appear on a provincial list;

    - the current level of disturbance associated with vegetation including a description of level of habitat fragmentation; and
    - the amount, merchantability and location of any merchantable timber to be removed during project construction;
- identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline vegetation biodiversity and discuss the rationale for their selection;
- provide GIS data files of mapped features depicting vegetation presence within the study area to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard;
- provide data files of mapped features depicting vegetation presence within the study area;
- describe any weed species, other invasive species and introduced species of concern; and
- describe the natural disturbance regime (e.g. fire, floods, droughts, etc.); and
- describe the use of local vegetation as a source of country foods and whether its consumption has any Indigenous cultural importance. Medicinal uses and use as construction materials should also be described.

7.8. Fish and fish habitat

The Impact Statement must, for all water bodies and watercourses directly or indirectly affected by the project:

- prepare a list of all water bodies and watercourses (permanent and intermittent) that will require a crossing. It is recommended that the information first be grouped by segment based on the administrative regions affected by the project, namely Ontario, Abitibi-Témiscamingue, Mauricie and Saguenay–Lac-Saint-Jean; for each segment, it is recommended that water bodies and watercourses be grouped by sub-watershed using the following criteria:
    - the size of the water bodies and watercourses, the width at the ordinary high water mark (OHWM) based on the following classes: large stream (over 20 m in width), medium stream (between 5 and 20 m in width), small permanent and intermittent streams less than 5 m in width);
    - the sensitivity of fish habitat at the crossing site (it is recommended that the attached document, entitled Table 4: Habitat Sensitivity (DFO 2013), taken from the interim Risk Management Guide for the Protection of Fish and Fish Habitat, be consulted);
    - the anticipated or selected method of crossing (trenched or trenchless);
- provide a description of the aquatic environment affected at the crossing sites; it is recommended that the information be presented in the form of tables and that the description be accompanied by photos;
    - for watercourses, it is recommended that characterization be performed on the basis of homogeneous section. The parameters to be measured include, but are not limited to, length of the section, width at the ordinary high water mark (OHWM), depth, streamflow types and characteristics (velocity, turbidity, peak and low flows, etc.), substrate type (shoreline and bottom), aquatic (grass flat) and riparian vegetation, natural barriers

(significant vertical drop, waterfalls, subsurface flow over large distances, beaver dams, etc.), and other barriers (stream crossing structures, etc.) that impede or obstruct free passage of fish. The obstacles must be documented (size, condition, etc.) and their passability by fish must be assessed;
    - for water bodies, the parameters to be measured include, but are not limited to, bathymetry, maximum and average depths, seasonal water level fluctuations, substrate type (sediment), aquatic (submerged, floating and emergent) and riparian vegetation, and water quality (temperature and dissolved oxygen profile, turbidity, transparency, pH);
- provide a description of fish populations, including species and life cycle stages, based on field surveys (standardized experimental fisheries) and available data (e.g., government and historical databases, fisheries data, information from consultation and engagement activities, traditional knowledge of Indigenous peoples affected by the project, etc.). The data sources must be identified, and detailed information relating to fisheries must be provided (description of gear and catch methods, location of sampling stations, date of surveys, species surveyed, size and life cycle stage, catch per unit effort, etc.). It is recommended that the information be presented in the form of tables;
- provide the location and area of potential and confirmed habitat in or near the work area and describe how they are used fish in terms of habitat function (spawning, nursery, growth, foraging, migration, cover habitat, thermal and winter refuge, etc.) and habitat suitability for species present. It is recommended that the information be presented on one or more maps at appropriate scales, and in the form of tables;
- prepare a list of aquatic species at risk (provincial and federal) that are known or likely to be present and provide the location and a description of suitable or potential habitat for these species (residence and critical habitat) at or near the work sites;
- water bodies and watercourses that may be indirectly affected by project components (e.g., right-of-way, temporary camps, work sites and storage areas, etc.) must be identified, listed and characterized (fish and habitat);
- describe the use of fish and/or aquatic species as country foods, and whether its consumption has Indigenous cultural importance. Also, all sites used in the study area or historically important sites for the collection of country foods must be identified and mapped, such as important fishing sites. Country foods, or traditional foods, are defined as all foods sourced outside of commercial food systems. They include any food that is trapped, fished, hunted, harvested, or grown for subsistence or medicinal purposes, outside of the commercial food chain. This definition encompasses the following food items:
    - aquatic and terrestrial wildlife that is fished, trapped, hunted or harvested (e.g., game birds or animals, fish and shellfish) for domestic consumption;
    - fruits and vegetables harvested from the wild (e.g., berries, seeds, leaves, roots and lichen);
    - plant tissue (e.g., roots, bark, leaves, and seeds) ingested for medicinal or other uses (e.g., teas);

- agricultural products (e.g., fruits, vegetables and mushrooms) grown in gardens and/or home orchards;
- aquatic and terrestrial wildlife (and their by-products) produced exclusively for domestic consumption (e.g., ducks, chickens, or other fowl, eggs and dairy products).

Note that:

- certain intermittent streams or wetlands (marshes, bogs, ponds, etc.) may constitute fish habitat or contribute indirectly to fish habitat. The absence of fish or water at the time of the survey does not irrefutably indicate an absence of fish and/or fish habitat (e.g. migratory corridor);
- beaver dams and accumulations of woody debris are not considered impassable barriers to fish;
- in the event that stream crossings will have to be temporarily or permanently installed, constructed or modified (e.g., to access a work area, compressor stations, etc.), the need to ensure free passage of fish will have to be documented. If the proponent determines that it is not necessary to maintain free passage of fish, it must provide justification by demonstrating that there is a natural barrier to free passage of fish at or near the site of the work (upstream or downstream), or that the habitat upstream of the work is of marginal quantity and quality.

7.9. Birds, migratory birds and their habitat

The impact study must:

- describe biodiversity of bird species and their habitats that are found or are likely to be found in the study area, including identification of Bird Conservation Regions (BCRs). Possible information sources include, but are not limited to, wildlife experts / naturalists, Canadian Conservation Data Centres, BCR strategies, E-Bird, Breeding Bird Atlas, Environment and Climate Change Canada's guidance on bird surveys (Referenced Documents - Part 2);
- gather data on birds so as to represent the following temporal sources of variation:
  - between years;
  - during and between seasons (e.g., spring migration, breeding, fall migration, overwintering); and
  - in the 24-hour daily cycle.
- explanatory data (i.e., covariables) required for modelling should be collected so as to represent the following spatial sources of variation:
  - land cover composition;
  - soil type;
  - geomorphology;
  - hydrological processes; and
  - interannual and intra-annual climate variability.

- collect data so as to permit sufficiently reliable extrapolations in space (i.e., at a minimum in the project areas, local study areas and regional study areas) and in time (i.e., over the years);
- design surveys so they represent spatial and temporal targets of modelling and extrapolations, and so they produce scientifically defendable forecasts of impacts and estimates of the effectiveness of mitigation measures. The surveys should be sufficiently sensitive to detect and quantify impacts at the above-mentioned spatial and temporal scales (i.e. PA, LSA, RSA), any variations from the forecasts and the effectiveness of the mitigation measures. Provide a rationale for the choice modelling techniques using current and recent scientific literature.
- describe the planning of survey protocols that should include modelling and simulations to estimate sampling needs, as well as analysis to evaluate the design options that result.
- collect field data to account for natural variability in populations. To achieve this, a minimum of two years of inventory is normally required unless existing data are available for the study area, in which case these data can be used to complement the data collected in the field (minimum 1 year). The available data must be sufficiently robust to assess the variability of populations between years and a demonstration to this effect must be presented;
- plan the sample size to ensure an assessment of the SA in the context of the LSA and the RSA. Proper survey planning will have to involve a number of survey locations in order to represent the heterogeneity of the RSA habitat and obtain a sufficient number of inventory locations by land cover or habitat category without the need to group habitat classes post-project;
- sampling effort per unit area – field surveys should be more intensive in the SA. The level of effort per unit area may be similar to or slightly lower in the rest of the LSA, but it should be proportional to the probability that the effects of the project will affect birds in this area. The steps taken outside the SA must be carefully designed so the comparative estimates between the SA, LSA and RSA are impartial and as accurate as possible;
- rare species require much greater detection efforts than common species, an aspect that must be taken into consideration during the survey development by increasing their number and duration;
- simulation modelling should be used to assess bias and accuracy between the SA, LSA and RSA in order to verify whether these estimates are useful for comparison purposes. Field surveys should be conducted in the RSA when there are few data that effectively describe the regional bird populations living in areas far from road networks;
- at minimum, the combined information from existing data and field surveys must be detailed to describe the distribution and abundance of all bird species in relation to the study areas;
- for avian species at risk, locate on an appropriately scaled map the potential habitats, survey locations, records of the species, residences and critical habitat, species by species. Illustrate on the map the project's footprint, identifying temporary and permanent infrastructure. Locate the highest concentrations or areas of use by species;

- submit complete datasets for all the targeted sites. These datasets should be presented in the form of complete, quality-assured relational databases containing precisely georeferenced information on the site, accurate data on observations and visits, and unabridged observations and measurements. The databases and GIS files must be accompanied by detailed metadata compliant with ECCC's metadata standards (ISO 19115 NAP) https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=16553;
- attach documents and digital files for all analysis results to provide a clear understanding of methods and ensure that results can be replicated (preference is given to data processing procedures rather than descriptive documentation);
- provide raw survey data and analysis results for 1) all birds, 2) each VC and 3) BCR priority species based on the following criteria:
    - frequency of occurrence;
    - abundance;
    - abundance in each type of habitat;
    - a map showing the areas with the highest concentrations of the species;
- provide a detailed description of bird habitat that includes as a minimum the characterization of the biophysical conditions of the ecoregions and BCRs, taking into account the specific conditions found near the borders of these regions. The project crosses ecoregions and BCRs and is located near their borders. Since the project areas are found, in particular, at the edge of ecoregions and BCRs or cross the borders, the habitat profiles should reflect these border characteristics.

- If there is displacement of breeding birds, the reference data should provide evidence that there is a significant number of equivalent habitats in which the birds can move and that the vegetation removed is not unique to the PA;
- identify the biodiversity measures, i.e., biotic and abiotic indicators that are used to characterize the baseline avifauna biodiversity conditions and discuss the rationale for their selection;
- species communities should not be grouped together by diversity indicator and should not be limited to the indicator species. The identification of species, distribution, abundance and, when possible, estimates of species' breeding status should be the main quantification objectives;
- the biodiversity metrics for each VC should include the following:
    - distribution in space;
    - frequency of occurrence;
    - occurrence and abundance trends in time;
    - abundance and, if possible, density;
    - the type(s) of associated habitats and the strength of the associations;
- provide abundance and distribution estimates, and information on the life history of migratory and non-migratory birds (including, but not limited to, waterfowl, raptors, shorebirds, marine birds, marsh birds and other land birds) in the study area. Estimates may

be based on existing information or additional surveys, as appropriate, to provide current data sufficient for reliable estimates;

- generate abundance and distribution measurements using spatially distributed and randomly chosen sampling sites. When major habitat edges are identified, sampling should be designed such that it is possible to sufficiently describe the importance not only of the types of habitat, but also of the edges between the types of habitat;
- ensure that the coverage is large enough to estimate and take into account detection errors and provide unbiased estimates of abundance and distributions using, as best practice, simulation modelling before sampling;
- sampling within temporal boundaries should be spatially and temporally balanced so that all spatial areas receive comparable temporal coverage;
- provide estimates of confidence or error values for all abundance and distribution estimates. The estimates should be defined (e.g., mean over several years, mean over several sites, modelled predictions) and confidence or other intervals should be defined (e.g., 95% confidence intervals, credible intervals). The use of hypothesis tests with *p* values is not generally appropriate in this context and a rationale should be provided for their use;
- each time that species' densities are estimated, take into account the detection error induced by observers to ensure the validity of comparisons between the counts (e.g., between surveys, before and after surveys, or between impacted and non-impacted sites). When detection errors are counted, the method used should take into account random variation between visits, as well as the detection variability dependent on the types of land cover, observers, meteorological conditions, period of year and species. Simulation methods can help to determine whether a specific method is appropriate for a survey model and a specific analysis. Care must be taken to avoid affecting the reliability of abundance estimates (see Barker *et al*., 2018. *Biometrics*, https://onlinelibrary.wiley.com/doi/full/10.1111/biom.12734);
- preferably use stratified random sampling in space. Sites should be chosen according to a random sampling procedure that takes the project's footprint into account. To select specific sampling sites, the sites in the area of interest must be well distributed and there must be coverage of the different types of habitat. The location should be chosen randomly using an approach to avoid implicit bias in the selection of a site;
- provide a rationale for the approach chosen. If necessary to guide or adjust the selection of the site based on access limitations, simulation modelling should provide evidence that this sampling strategy has not led to the introduction of bias;
- survey the relevant characteristics of the vegetation in a way that is not disproportionate with respect to the other types of vegetation. Bias in abundance estimates would compromise extrapolation and statistical deduction possibilities;
- record all the criteria used to choose the location of parcels in the IA. Identify areas of concentration of migratory birds, including sites used for migration, staging, breeding, feeding and resting;

- concentrations of migrating birds may vary over the course of a year and from one year to the next. It is therefore important to conduct surveys in all PAs, LSAs and RSAs over space and time;
- counts of migrating birds are influenced by the presence of species and the length of their stay. Any attempt to estimate their abundance during a migratory period must include an estimate of the length of their stay and annual and intra-annual trends. With respect to abundance, irruptive species (e.g., Evening Grosbeak) may act in the same manner as migrating birds. They can withdraw from an area until the conditions change;
- provide a description of food webs and trophic linkages to summarize biotic interactions;
- ensure that food webs or the interactions described are relevant for the study areas because they can vary between geographical regions and ecosystems. If necessary, structural equation models can provide a useful technique for quantifying such links in the SA and the LSA;
- provide a characterization of habitat features found in the project area that are associated with the presence of those bird species that are likely to be affected, based on the best available existing data (e.g., land cover types, vegetation, marine elements), including habitat fragmentation;
- the classification should include local aerial photographs and photographs taken at the site;
- provide an estimate of estimated year-round bird use of the area (e.g., winter, spring migration; breeding season; fall migration), based on preliminary data from existing sources and surveys to provide current field data if required to generate reliable estimates;
- for each period of the year, the survey effort must take into account differences in the species' movements, including winter use of species highly dependent on the habitat and highly mobile species, that accurately characterize the use of a site;
- describe the use of (magnitude, timing) migratory and non-migratory birds as a source of country foods and whether consumption has Indigenous cultural importance;
- identify any and all federal species at risk and/or critical habitat in the study area; sites that are likely to be sensitive locations and habitat for birds or environmentally significant areas. These include, without being limited to, National Parks, Areas of Natural or Scientific Interest, Migratory Bird Sanctuaries or other priority areas or sanctuaries for birds, National Wildlife Areas or World Biosphere Reserves, offshore Marine Protected Areas, and ecologically and biologically significant marine areas.

The description of bird species and their habitat in the study area may be based on existing sources, but supporting evidence is required that demonstrates that the data used are representative of the avifauna and habitats in the study area. Existing data must be supplemented by surveys, if required, to produce a representative sample of the avifauna and habitats of the study area.

Avian surveys should be designed in light of a thorough review of the available scientific literature pertinent to the specific region, bird groups and anticipated impacts. The *Framework for the*

Scientific Assessment of Potential Project Impacts on Birds provides examples of project types and recommended techniques for assessing effects on migratory birds (see the Referenced Documents – Part 2).

7.10. Terrestrial wildlife and their habitat

The Impact Statement must:

- identify wildlife species, other than avian species, of ecological, economic or human importance, within the study area, that are likely to be directly or indirectly affected and describe the following for each species:
- biodiversity, distribution and location;
- abundance and population status;
- life cycle;
- seasonal ranges, migration and movements;
- habitat requirements; and
- sensitive periods (e.g. seasonal, diurnal and nocturnal).

The provincial governments of Quebec (MFFP) and Ontario (MECP) may be able to provide information on data sources and survey methods. As for inventories, the proponent must, as part of the impact study:

- Collect wildlife data to represent the following sources of time variation:
    - between years,
    - during and between seasons (e.g., spring migration, breeding, fall migration, wintering),
    - in the daily 24-hour cycle.
- Submit complete data sets from any survey sites. These data sets should be presented as comprehensive, quality-assured, relational databases containing accurately geo-referenced information on the site, precise data on observations and visits, as well as unabridged observations and measurements. Databases and GIS files must be accompanied by detailed metadata that meet ECCC metadata standards (ISO 19115 NAP) https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=16553.
- For all analysis results, attach documents and digital files that allow a clear understanding of the methods and reproduction of the results (preference is given to data processing procedures rather than descriptive documentation).
- For the species identified above, describe and quantify the habitat type, including its: function; location; suitability; structure; diversity; relative use; natural inter-annual and seasonal variability, and; abundance as it existed before project construction.

- Identify the biodiversity metrics, i.e. biotic and abiotic indicators that are used to characterize the baseline biodiversity for terrestrial wildlife and explain the rationale for their selection.
- Describe the use of terrestrial wildlife as a source of country foods (traditional foods) and whether its consumption has Indigenous cultural importance.
- Describe the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural importance.
- Describe any locations within the study area that might constitute sensitive areas for terrestrial wildlife such as: species at risk critical habitat that has been designated or is under consideration, ecological reserves and protected areas, in proximity to the project location or that could be affected by routine project operations or any lands in the study area that might constitute sensitive areas and habitat for wildlife, or nearby environmentally significant areas, such as National Parks, areas of natural or scientific interest, National Wildlife Areas, World Biosphere Reserves or UNESCO World Heritage Sites;
- Identify wildlife management areas and established or proposed sanctuaries.
- Describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use.

7.11. Species at risk under Schedule 1 of the *Species at Risk Act*

The Impact Statement must:

- provide a list of all species at risk listed under Schedule 1 of the federal Species at Risk Act that may be directly or indirectly affected by the project;
- include traditional knowledge and Indigenous importance, where appropriate;
- use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability of each species;
- collect wildlife data in order to represent the following sources of time variation:
  - between years,
  - during and between seasons (e.g. spring migration, breeding, fall migration, wintering),
  - in the daily 24-hour cycle.

The detection of rare species will require more survey effort, which needs to be taken into account in the survey design by increasing the number and duration of surveys. For rare and endangered species, the Impact Statement must:

- collect field data to account for natural variability in populations. To achieve this, a minimum of two years of inventory is normally required unless existing data are available for the study area, which can be used to complement the data collected in the field (minimum one year). The available data must be sufficiently robust to assess the variability of populations between years and a demonstration must be presented for that purpose;

- plan the sample size to ensure sufficient assessment of the PA in the context of the LSA and RSA.
    - Survey design will need to consider a large number of sites to represent the heterogeneity of RSA habitat and to plan the number of sites by land cover or by habitat class so that aggregation of post hoc habitat classes is not necessary.
    - In terms of sampling effort per unit area, focus primarily on field surveys within the PA.
    - The level of effort per unit area may be similar or slightly lower in the remainder of the LSA, but should be proportional to the likelihood that project effects will affect species at risk in that area.
    - Actions undertaken outside the PA must be carefully designed to ensure that comparative estimates between the PA, LSA and RSA are unbiased and sufficiently accurate.
- preferably use stratified random sampling of habitat.
    - Sample sites must be selected using a random procedure such as a Geographic Information System (GIS) grid overlay.

Where critical habitat for these species has not been designated or has been partially designated, a survey schedule may have been created to identify information gaps for these species. When implementing or evaluating survey protocols, it is recommended that the survey schedule be consulted in order to provide all necessary data for these species.

The combined information from existing data and field surveys must at least be able to describe the distribution and abundance of species at risk in relation to the study areas. The Impact Statement must:

- locate, species by species, on a map at an appropriate scale, potential habitats, survey sites, species sighting records, residences and critical habitat. Illustrate, on the map, the project footprint by identifying temporary and permanent infrastructures. Locate the highest concentrations or areas of use by the species;
- submit complete data sets of all target sites. These data sets should be presented as comprehensive, high-quality relational databases, containing accurately georeferenced information on the site, precise data on observations and visits, as well as observations and measurements in non-summary form. The databases and GIS files should be accompanied by detailed metadata conforming to the ECCC metadata standards (ISO 19115 NAP[7]);
- attach, to the analysis results, documentation and digital files that allow for a clear understanding of the methodology, the analyses and a replication of results (preference is given to data processing procedures rather than descriptive documentation).

Bat-specific assessment requirements

[7] https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=16553

- The proponent should consult provincial government experts on appropriate survey methods for bats. Provide a rationale for the methodology used, and include the following elements:
  - To expand existing sources of information and collect data to establish sound baseline conditions and assess impacts, conduct site-specific surveys in order to:
    - provide an overview of the species (present/undetected);
    - quantify bat baseline activity to assess the relative use of different habitats or features in the project area and to assist in evaluating and justifying decisions regarding project location and anticipated impacts;
    - document baseline conditions within the project area and local assessment area to support the impact study;
    - locate and confirm the use of high-value habitat features such as resting sites (such as hollow trees and buildings that can serve as resting and maternity sites) and hibernacula;
    - identify potential regional migration corridors; and
    - identify site-specific travel corridors and movement patterns.
- The following types of surveys are required:
  - acoustic surveys, ensure study design is statistically valid;
  - continuous acoustic monitoring throughout the night (at least from sunset to sunrise: 30 minutes before sunset to 30 minutes after sunrise is recommended), active season (spring dispersal/migration, summer breeding/fall migration and swarming [fall staging]), as well as appropriate surveys of hibernation sites;
  - locate and assess potential hibernation sites for bat use, taking into account the inter-annual and seasonal variability of use.
- Data or reports must include information on the acoustic detection methods used, including:
  - detector make and model;
  - microphone model used;
  - location of detectors;
  - height of microphones;
  - orientation of microphones;
  - special housing that may affect microphone sensitivity (e.g. wind screen, cones, weatherproofing, etc.);
  - mounting method (e.g. meteorological tower, pole, etc.);
  - device-specific settings (e.g. gain/sensitivity, to be confirmed, etc.);
  - recording mode (i.e. full spectrum or zero crossing); and
  - a summary of any equipment failure issues and a description of procedures used to ensure equipment was functional during deployment (including ensuring microphone sensitivity remains within an acceptable range).
- Clearly describe how bat “passage” is defined, consistent with the definition used for any control group, and justify the choice of modality.

- Clearly describe the methods used for acoustic identification, including validation procedures, species classification criteria and software used, if applicable (including versions and parameters).
- When results are compared from year to year, the survey schedule, the equipment and the installation protocols must remain consistent from year to year.

Caribou-specific assessment requirements (the Val-d'Or herd)

- Provide the best information available from the Government of Quebec regarding population size and trends.
- The proponent should consult Quebec provincial experts on appropriate survey methods for caribou. Provide justification for the methodology used.
- When developing boreal caribou surveys, the following source of information should be consulted:
  - An Aerial Survey Technique for the Forest-Dwelling Ecotype of Woodland Caribou: https://mffp.gouv.qc.ca/wp-content/uploads/SagCN_2003.pdf

Turtle-specific assessment requirements

- Provide the best available information from the responsible authority on population size and trend.
- The proponent should consult provincial government experts on appropriate survey methods for turtles. Provide justification for the methodology used.
- When developing turtle surveys, the following sources of information should be consulted:
  - Ministère des Forêts, de la Faune et des Parcs (MFFP). 2019, *Protocole standardisé pour l'inventaire de la tortue des bois au Québec.* Government of Quebec, Quebec, 28 p. + appendix.
  - Ontario Ministry of Natural Resources and Forestry (OMNRF), 2015, *Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in Ontario*, Species Conservation Policy Branch, Peterborough, Ontario. ii + 16 pp.

A permit under the *Species at Risk Act* should be obtained for surveys if there is a chance that species at risk will be harmed, harassed, captured or killed.

Species assessed by the COSEWIC

The Impact Statement must:

- provide a list of all species assessed by the COSEWIC that have the status of extirpated, endangered, threatened or of special concern and that may be directly or indirectly affected by the project;
- use existing data and literature as well as surveys to provide current field data that reflect the natural seasonal and inter-annual variability.

For the species above:

- provide any published studies that describe the regional importance, abundance and distribution of species at risk, including recovery strategies or plans.
  - include traditional knowledge and Indigenous importance, where appropriate;
- provide data and summary lists for each species at risk ranked according to the following criteria:
  - abundance,
  - distribution among the target sites (i.e. % of survey stations where they were recorded),
  - abundance in each habitat type,
  - a map locating, species by species, potential habitats, survey sites, species sighting records, to which will be superimposed the temporary and permanent infrastructures of the project.
    - Identify the highest concentrations or areas of use by species;
- survey protocols should optimize detectability and survey efforts should provide for comprehensive coverage at the appropriate time of year (e.g. survey breeding habitat during the breeding season, stopover habitat during migration).
  - Provide a rationale for the scope and methodology used for the surveys, including design, sampling protocols and data handling.
- where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications.
  - Indicate who was consulted in the development of the baseline surveys (e.g. federal/provincial wildlife experts, specialists and local Indigenous peoples).
- provide information and/or mapping at an appropriate scale for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed Critical Habitat and/or recovery habitat (where applicable).
- describe the general life cycle of species at risk (e.g. breeding, foraging) that may occur in the project area or be affected by the project.
- identify and map, species by species, sightings, critical habitat and residences.
- locate federal land within the PA and LSA.
- the PA and LSA, as defined above for each VC, constitute the appropriate scale.
- provincial and/or local government authorities should be contacted to determine additional data sources and survey methods.

Concerning the submission of the required information on bats **:**

- Quantify bat baseline activity (e.g. using acoustic detection to calculate a bat activity index) to assess the relative use of different habitats or features in the project area in order to evaluate and justify decisions regarding project location and anticipated impacts. In addition, locate and

confirm the use of high-value features such as maternity wards, feeding areas and hibernacula.

Concerning the submission of the required information on the caribou

- Describe the use of the study areas by boreal caribou (e.g. distribution, movement) over time using survey data to supplement existing data if they are not sufficient. Involve the government of Quebec in meeting data and survey requirements. Consider Indigenous traditional knowledge and community knowledge.
- Sensitive periods are associated with caribou life stages such as calving, overwintering and movements. Quebec has specific sensitive time periods for caribou which are used to identify, delineate and take into account habitat features.
- Describe the type and spatial extent of biophysical attributes present in the study areas and defined in Appendix H of the Modified Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada 2019 (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html).
- Conduct surveys to supplement existing data if data in the project study areas are insufficient or unavailable in order to understand where the biophysical attributes are located. Note that the identification of biophysical attributes is not dependent on the presence of boreal caribou in the area.

The government of Quebec could have recent and detailed data on the disruptions that should be taken into account. Provide the best available information from the MFFP on the level of disturbance (anthropogenic or fire-induced) in the range, consistent with the methodology developed by Environment Canada (2011).[8]
Refer to the most recent COSEWIC annual report for the list of designated wildlife species posted on their website (see Referenced Documents–Part 2).

8. Baseline conditions – Human health

Baseline information is required on existing human health conditions and must include the current state of physical, mental and social well-being and incorporate a social determinants of health approach to move beyond biophysical health considerations. A determinant of health approach [9] recognizes that health is more than the absence of disease but includes broad factors that support

[8] In some instances, provincial methodologies may differ from federal recommendations. Consider both methodologies in order to apply the federal 35% habitat threshold and to determine the rate of habitat disturbance. If provincial disturbance information applies to more recent information (i.e. best available information), this information should also be considered.

[9] For information, there is a difference between the determinants of health and the social determinants of health:

- Determinants of health: The determinants of health include a wide range of personal, social, economic and environmental factors that determine the health of an individual or population.
- Social determinants of health: The social determinants of health encompass specific social and economic factors within the broad determinants of health.

well-being. The scope and content of the human health baseline must reflect the specific project context, take into account input from the public and Indigenous peoples, and include indicators that are meaningful for the effects analysis. The information provided must:

- be targeted to allow a comprehensive understanding of the state of human health, including potentially impacted Indigenous peoples;
- describe how community and Indigenous knowledge from relevant populations was used in establishing baseline health conditions, including input from diverse subgroups;
- describe baseline health conditions for subgroups within the community to support GBA+.

In preparing the report on baseline health conditions, the proponent must identify the social area of influence of the project. Information on interested parties, those likely to be directly or indirectly affected by the project, should be provided taking into account community members who are considered particularly vulnerable to changes brought about by the project.

As applicable, reference information should be sufficiently disaggregated and analyzed to support the analysis of disproportionate effects under GBA+. To understand the community and Indigenous context and the baseline health profile, the proponent must:

- describe any context-specific definitions of health and well-being, including from the perspective of the relevant Indigenous cultures;
- describe relevant community and Indigenous history or context, including historical impacts on health;
- use a determinants of health approach to identify and describe relevant outcomes. Determinants of health should, where possible, be selected with community input to reflect the context and circumstances of the affected communities. They can be selected from the set of determinants generally recommended by the Public Health Agency of Canada and available at the following address: https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html
    - physical environments;
    - employment and working conditions;
    - social environments;
    - health services;
    - income and social status;
    - education and literacy;
    - childhood experiences;
    - social support and adaptability
    - healthy behaviours
    - biology and genetic endowment
    - gender;
    - culture;
    - racism.

- other recognized approaches may also be used. Refer to Health Impact Assessments – National Collaborating Centre for Environmental Health (NCCEH) Resources, available at: http://www.ncceh.ca/environmental-health-in-canada/health-agency-projects/health-impact-assessments. National Collaborating Centre for Environmental Health (NCCEH). 2019.
- develop a community health profile that reflects the overall health of the community, including birth rates, death rates, sexually transmitted infections, injuries, chronic disease rates and mental health status and other community-relevant health issues, where available through secondary information sources (e.g. Public Health Agency, Statistics Canada, provincial health authorities);
- describe and characterize existing health services and programs, including health care provider capacity;
- provide the approximate location and distance of likely human receptors, including foreseeable future receptors, that could be affected by changes in air, water, country food quality, and noise levels. At minimum, provide a map showing the approximate locations of permanent residences, temporary residences (e.g. Indigenous cottages and camps) and sensitive receptors (e.g. schools, hospitals, community centres, retirement complexes, health care centres);
- describe drinking water sources, both surface and/or groundwater (permanent, seasonal, periodic or temporary), including approximate catchment areas at wellheads and their distance from project activities;
- describe what country food (traditional foods) is eaten and by which Indigenous peoples, the amount and frequency of consumption, and where this food (traditional foods) is harvested;
- ensure that the data are representative of site conditions; if surrogate data from reference sites are used rather than Project site-specific measurements, demonstrate how the data are representative of site conditions; and
- describe the food security within local and Indigenous communities. Refer to the following site for more information on food safety: https://cbpp-pcpe.phac-aspc.gc.ca/public-health-topics/food-security/

The section Referenced Documents - Part2 refers to guidance to help establish the relevant baseline profile for human health.

9. Baseline conditions – Social context

Baseline information is required on existing social conditions and must include social well-being and social activities for Indigenous communities and peoples. The scope and content of the baseline social conditions should be tailored to the specific project context, take into account community and

Indigenous input, and include indicators and information that are useful and meaningful for the effects analysis. The information provided must:

- be sufficient to provide a complete description of the current state of each valued component, including relevant trends;
- describe how community and Indigenous knowledge of related populations was used in establishing baseline social conditions, including observations from diverse subgroups;
- describe the baseline social conditions for various subgroups within the community to support GBA+; and
- include an analysis of the interaction of different categories of social conditions or variables for the defined subgroups.

In preparing a baseline, the proponent must identify the area of social influence of the project and develop a community profile. To understand the community context, the information must describe the following:

- influences on community well-being;
- access, ownership and use of resources (e.g. land tenure, minerals, food, water, social infrastructure);
- the capacity (currently available or planned) of institutions to deliver public services and infrastructure;
- relevant historical community background; and
- applicable history with previous proponents, including whether and how Indigenous peoples were consulted and the results of those consultations.

Information related to interested parties, those likely to be affected directly or indirectly by the project, should be provided taking into account community members considered particularly vulnerable to changes brought about by the project.

Baseline information must be sufficiently disaggregated and analyzed to support the analysis of disproportionate effects under GBA+, and include information on the following components if they may be affected directly or indirectly by the project:

- describe the sociocultural environment of the study area by identifying the Indigenous peoples and predominant cultural communities; the demographic characteristics of the local population and workforce; and the major sociocultural concerns of residents, families and workers in the study area;
- describe general patterns of human occupancy and resource use based on selected spatial and temporal boundaries (include maps where available);
- describe remote, rural and urban environments.

Reference data are often found in secondary sources of information, such as census data, government publications and academic papers. Where secondary sources are unable to provide the required information, primary sources (surveys, key informant interviews, focus groups and other primary research methods) should be used.

9.1. Land and resource use

The Impact Statement must describe the general patterns of human occupancy and resource use in the study area, including any applicable local or regional land use plans or local or regional development plans.

The assessment of possible impacts on human occupancy and resource use must include:

- the description of general patterns of human occupancy and resource use based on selected spatial and temporal boundaries (include maps where available);
- the description of sites or areas that are used by local people and Indigenous peoples either as a permanent residence or as a seasonal/temporary location, and the number of people using each identified site or area (include a map, if possible);
- remote, rural and urban residential areas (including seasonally and year-round occupied establishments), Indian reserves, Indigenous peoples and Indigenous traditional territories;
- agricultural areas (including special crops, orchards and vineyards);
- livestock health and productivity;
- parks and recreation areas (including local and provincial/territorial parks and recognized scenic areas);
- Parks Canada lands, conservation areas, International Biological Program sites or other ecological reserves;
- industrial and commercial sectors;
- monitored or administered forest areas (including forests under agreement and areas designated for timber sales);
- registered or recognized hunting, trapping or guiding areas and recreational and commercial fishing areas;
- water supplies and water lots, as well as water sources and intakes for farms, industries, residents and municipalities; and
- transport infrastructure which, in addition to roads and railways, would also include waterways.

9.2. Navigation and navigation safety

The Impact Statement must:

- describe existing navigable waterways and provide a list of potentially affected waterway users and concerns regarding waterway use and access; and
- describe the current use of all waterways and water bodies, including recreational use;

9.3. Infrastructure

The Impact Statement must describe the existing local and regional infrastructure facilities in the study area, including:

- road infrastructure and traffic safety;
- railways;
- pipelines, water mains and sewer lines;
- power lines;
- utility facilities; and
- all other facilities likely to be affected.

9.4. Services

The Impact Statement must describe the existing local and regional services in the study area, including:

- accommodation, housing (e.g. affordability, availability, suitability), including campgrounds;
- recreation and parks;
- waste disposal;
- police and fire departments;
- educational services, facilities and daycare;
- ambulance and health care services;
- mental health and social services; and
- all other possibly affected services.

10. Baseline conditions – Economic context

The economic baseline information should describe local and regional economic conditions and trends in relation to the selected spatial and temporal boundaries. The scope and content of the economic baseline should reflect the specific project context, take into account community and Indigenous group input, and include information that is useful and meaningful for the effects analysis. The information provided must:

- be sufficient to provide a complete description of the current state of each valued component, including relevant trends;
- describe how community and Indigenous knowledge from affected populations, including input from various groups, was used to establish baseline conditions; and

- describe the baseline economic conditions for various subgroups in the community to support GBA+.

Information regarding those who are likely to be directly or indirectly affected by the project should be provided taking into account community members considered particularly vulnerable to changes brought about by the project. As applicable, reference information should be sufficiently disaggregated and analyzed to support the analysis of disproportionate effects under GBA+.

10.1. Training

The Impact Statement must describe local and regional workforce development and training plans.

10.2. Employment

The Impact Statement must:

- describe the workforce, including the availability of skilled and unskilled workers, existing working conditions, wages and average wage scale, full-time and part-time employment and training;
- describe the demographic features of the local and regional population as well as the economic concerns and aspirations of residents, families and workers in the study area;
- provide an overview of the existing employment rates and economic well-being in the study area and impacted communities;
- provide an overview of current labour market statistics, including jobs likely to be in demand over the life of the project; characterize the economic conditions to support the assessment of project-related effects, including differences in experiences among diversity-representative subgroups, including Indigenous populations, as appropriate (e.g. women, youth, seniors).

10.3. Contracts and procurement

The Impact Statement must:

- describe the main economic activities in the study area;
- give an overview of companies that can provide the products and services required for the project;
- describe the current use of land and water bodies in the study area for food, social or ceremonial purposes, including as defined by Indigenous and Treaty rights, as well as a description of hunting, recreational and commercial fishing, trapping, recreational activities, use of seasonal camps, outfitting, agriculture, forestry and institutions;
- describe the current use of land and water bodies in the study area; and
- describe commercial marine and freshwater fisheries, including species caught, number of licences, value of the fishery, and the distribution between Canadian and international fisheries, if applicable.

10.4. Economy

The Impact Statement must provide details on supply, transportation, markets and financing. The purpose of submitting information on the economics of the facility is to demonstrate that the facilities applied for will be used, will be useful, that the costs of the application will be paid and that sufficient funds are available to meet the closure requirements.

11. Baseline conditions – Indigenous peoples

The proponent is encouraged to work with Indigenous peoples in developing baseline conditions, in order to identify and understand the potential impact of their projects on Indigenous peoples, and to incorporate Indigenous knowledge into the impact assessment. The results of any consultation should be presented in the Impact Statement and should, as far as possible, reflect the views of the Indigenous peoples involved.

The proponent is encouraged to provide Indigenous peoples with an opportunity to review the information prior to submission of the Impact Statement. The Impact Statement should indicate where input from Indigenous peoples, including Indigenous knowledge, has been incorporated. To the extent possible, information should be specific to the individual Indigenous group involved in the assessment and include contextual information about the members within an Indigenous group (e.g. women, men, elders and youth).

Where Indigenous peoples do not wish to participate, the proponent is encouraged to continue to share information and analysis with the Indigenous peoples about the potential effects of the project and to use available public sources of information to support the assessment, and to document their efforts to do so.

The proponent is encouraged to consult the Agency's guidelines on engaging Indigenous peoples, in particular the document *Assessment of Potential Impacts on the Rights of Indigenous Peoples*.

Where possible, the Impact Statement should include contextual information, both historic and current, on the history and cultural practices of an Indigenous people, land use, and how the rights or interests of Indigenous peoples are or may be exercised and affected by the project according to the description made by Indigenous peoples. Background information may include the following:

- the natural and cultural heritage of each Indigenous people;
- the current use of lands and resources for traditional purposes;
- the health, social and economic conditions of Indigenous peoples; and
- the nature and extent of the rights exercised.

11.1. Physical and cultural heritage

The Impact Statement should include a description of the historical baseline conditions associated with Indigenous cultures. This description should take into account an understanding of the historical baseline conditions associated with the ability to transmit culture (e.g. through language, ceremonies, harvesting, teaching of sacred laws, traditional laws, stewardship laws, traditional knowledge).

Indigenous physical and cultural heritage is deemed to include, but is not limited to, sites, structures or features of archaeological, paleontological, historical or architectural significance.

Information on Indigenous peoples may include:

- burial sites;
- cultural landscapes;
- oral history;
- cultural values and experiences on the land;
- Indigenous governance systems and Indigenous laws associated with the landscape;
- sacred, ceremonial or culturally significant places, plants, animals, objects, persons or elements; and
- places with archaeological potential or places where artifacts are located.

11.2. Current use of lands and resources for traditional purposes

The Impact Statement should include information on the current use of lands and resources for traditional purposes (e.g. hunting, fishing, trapping, plant gathering, spiritual or ceremonial practices). The proponent is encouraged to consult on the Agency's website the document: *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012*.

In general, the Impact Statement should take into account the following:

- location and description of Treaty rights, title area, land claims or traditional territory (including maps where available);
- location of reserves and communities;
- traditional activities currently or historically practised (e.g. hunting, fishing, trapping, gathering of plants or medicinal plants);
- traditional use areas such as hunting, trapping and fishing camps and cabins, and traditional gathering or teaching areas;
- types of traditional resources such as fish, animals, birds, plants or other natural resources important for traditional purposes;

- places where culturally important fish, wildlife, birds, plants and other natural resources are harvested;
- access and travel routes for conducting traditional practices;
- frequency, duration and timing of traditional practices;
- where known, efforts of groups to bring back traditional practices;
- description of country foods (traditional foods);
- quality and quantity of resources (e.g. preferred species and perception of quality);
- access to resources and land (e.g. physical access to harvestable species, culturally important harvesting locations, timing, seasonality, distance from community);
- the experience of the practice (e.g. connection to the landscape without artificial noise and sensory disturbance, air quality, visual landscape, perceived or actual contamination, etc.);
- consideration of the potential impacts, during the various project phases, including the construction, operation and closure phases, on sites of interest to the community (hunting, fishing, trapping or gathering sites, landscapes of interest, sacred or archaeological sites, etc.) and on the activities carried out there (food, domestic, ritual or social), in particular:
  Access to the territory, changes in the distribution and availability of harvested wildlife (wildlife avoidance), impacts on the transmission of traditional knowledge related to these activities, impacts on the physical and psychological health of the population (e.g. food security, indirect impacts in the event of pollution—contamination of fauna and flora);
- Impacts on Indigenous peoples related to the participation and ongoing monitoring of the construction, operation and closure of the project; and
- other common uses recognized by Indigenous peoples.

If this type of information is found in public sources, the proponent should inform the Indigenous peoples and give them a reasonable opportunity to review and comment on it before including it in the Impact Statement.

11.3. Human health and socioeconomic conditions

The baseline established in the above sections for health, social and economic conditions include Indigenous peoples and GBA+ specific to Indigenous peoples. This section should also consider access to resources needed to exercise rights (e.g. physical access to culturally important locations, timing, seasonality, remote and undisturbed areas, distance from community) and the effects of loss or fragmentation of land on access to building materials, clothing and health care.

11.4. Conditions relating to the rights of indigenous peoples

The Impact Statement should describe the nature and extent of the exercise of the rights of the Indigenous peoples who may be affected by the project, as indicated by the Indigenous peoples. Indigenous peoples may also present their views in consultations with the Agency. Such rights information may include, but is not limited to, the following:

- a general description of section 35 rights exercised in the project area, including the historical, regional and community context;
- the quality and quantity of resources needed to support the exercise of rights (e.g. preferred species);
- access to the resources needed to exercise rights (e.g. physical access to culturally important locations, timing, seasonality, distance from the community);
- experience related to the exercise of rights (e.g. noise and sensory disturbances, air quality, visual landscape);
- specific areas of cultural importance where rights are exercised;
- landscape conditions that support the Indigenous peoples' exercise of rights (e.g. large, intact and diverse landscapes, areas of solitude, connection to landscape);
- where possible, information about the members of an Indigenous people and their role in the exercise of rights (e.g. women, men, elders, youth, persons with disabilities);
- how the Indigenous peoples' cultural traditions, laws and governance systems inform the manner in which they exercise their rights (who, what, when, how, where and why);
- where appropriate, designation of thresholds identified by the community that, if exceeded, may impair the ability to meaningfully exercise rights;
- maps and data sets (e.g. overlaying the project footprint, places of cultural and spiritual importance, traditional territories, fish catch numbers); and
- pre-existing impacts and cumulative effects that are already interfering with the ability to exercise rights or to pass along Indigenous cultures and cultural practices (e.g. language, ceremonies, Indigenous knowledge).

12. Anticipated changes to the natural environment

The changes to the components of the natural environment described below are related to other components within the broader ecosystem framework. The description of the changes caused to the natural environment must be integrated into the assessment of the effects of each valued component and the interaction between the valued components in the Impact Statement. An alternative approach is to identify these natural environment components as valued components in their own right. The interconnections between environmental valued components and social, health and economic valued components, and the interactions between effects should also be described.

12.1. Changes to the atmospheric, acoustic and visual environment

The Impact Statement must describe all interactions between the project and the atmospheric, acoustic and visual environment, including the following details, if relevant:

- The air quality assessment must include an accurate estimate of emissions at all project phases (construction, operation, closure and remediation) and for all sources associated with the project.
- Provide a detailed description that includes the characteristics of all contaminant emission sources including, but not limited to, off-road and on-road equipment, compressor stations, generators, fugitive emissions, dust from unpaved roads, maintenance activities, start-up and running-in operations, flaring, burning (note that open burning is prohibited in Quebec except in certain cases. The proponent should inquire about provincial requirements).
- provide a quantitative assessment of all potential emissions of criteria air contaminants [e.g. nitrogen oxide, hydrogen sulphide, sulphur dioxide, ozone, diesel particulate matter, volatile organic compounds such as benzene, toluene, ethylbenzene, xylene, mercaptan, carbon monoxide, particulate matter (total PM, PM 10 and PM 2.5)] during all project phases;
- provide a quantitative assessment of the deposition of dust and other contaminants on sensitive receptors including dust deposition resulting from construction activities;
- provide detailed information on emission estimation methodologies for all project phases;
- use established methodologies to estimate emissions from all sources, including but not limited to those from on-road and off-road activities;
- provide an assessment of project emissions that could contribute to or increase current levels of ground-level ozone;
- include an atmospheric contaminant dispersion model for each of the three compressor stations during the operation phase should they be supplied with natural gas;
- provide a complete list of sources of air pollutant emissions that may affect ambient air quality (e.g. emissions from heavy machinery, boilers and heaters, fugitive dust from vehicle traffic and soil handling, fuel combustion by-products, blasting by-products);
- provide details on the configuration of the atmospheric dispersion models used, including meteorology, land use, modelling domain, receptor grid density, land users, default options and chemical and physical transformation parameters, where applicable;
- describe source characteristics (e.g. point emissions, volume sources, area sources, diffuse sources, flare emissions, and fugitive sources);
- provide emission rates for all project sources, including emission factors (with methodology, uncertainty and references) and all related assumptions and parameters that would allow the calculations to be replicated (provide sample calculations);
- provide maps of isopleths at the appropriate scale (i.e. providing a clear visualization of the extent of dispersion and sensitive receptors) illustrating the predicted emissions for the modelling scenarios; and

- provide a comparison of predicted air quality concentrations at potential receptors, including traditional land use sites, against the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter (PM2.5), sulphur dioxide (SO2), nitrogen dioxide (NO2) and ozone (O3). Predicted concentrations of other air pollutants relevant to the project should be compared to appropriate provincial and territorial guidelines , if applicable (e.g. CO and total PM). Assessment regarding the CAAQS should be based on the principles of continuous improvement and keeping clean areas clean, and in the context of airsheds and air zones on the Air Quality Management System;
- for air pollutants with standards (e.g. Canadian Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Objectives (NAAQOs), Ministère de l'environnement et de la lutte contre les changements climatiques du Québec, or Ontario Ambient Air Quality Criteria (AAQC)), use the averaging period and statistical form associated with the standard;
- document and justify the contaminant emission reduction efficiencies applied in the calculation of emission rates, including details of all assumptions associated with these mitigation measures and their feasibility;
- describe participation in national or regional air emissions monitoring and reporting programs (e.g. NPRI) or explain why participation is not required; and
- provide a description of any methods and practices (e.g. control equipment, heat or gas recovery systems during operation phase, dust control during the construction phase) to be implemented to reduce and control emissions. If the best available technologies are not selected in the project design, the proponent will have to justify the selected technologies;
- provide details on the achievement of emission standards for all mobile and stationary engines used in the project;
- describe the changes in ambient vibration and sound levels at sensitive receptors, including traditional land use sites, resulting from the project;
- where there is public concern associated with an increase in sound levels during construction, provide a vibration and noise impact assessment, including an overview of the concerns;
- for projects that result or may result in an increase in sound emissions during operation or maintenance, the Impact Statement must:
- quantify sound levels at appropriate distances from any project facilities and describe the timing (e.g. day, night), frequency, duration, frequency distribution, duration and character of the sound;
- describe the locations and characteristics of the most sensitive receptors, including species at risk;
- describe consultations with regulators, stakeholders, community groups, landowners and Indigenous peoples regarding potential effects on the acoustic environment; and
- provide a noise management plan, including the identification of noise sources, an assessment of current noise mitigation measures, the effectiveness of the performance of noise control devices, best practice programs and continuous improvement programs, and determine the

need for follow-up monitoring for the purpose of model validation or due to concerns raised by the public. Noise management plans should address the following: notification and planning of maintenance activities, such as express purging and ventilation of equipment during daylight hours; notification of nearby residences and local authorities regarding noise prevention and management plans and procedures;

- provide the distribution of the reference nighttime sound events relative to the individual sound events expected at night at the location of each receptor;
- take into account expectations of peace and quiet for receptors (e.g. in a quiet rural area or during land use by Indigenous peoples) and noise policies (e.g. processes for resolving and dealing with public complaints);
- specify and justify the approach used to determine the extent to which noise effects resulting from the project are adverse and describe any changes in nighttime lighting levels resulting from the project; and
- describe any positive changes.

The proponent should refer to Health Canada's "Guidance for Evaluating Human Health Impacts in Environmental Assessment: NOISE" and "Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality" to ensure that it provides the information and analysis that Health Canada considers necessary to assess the project's impacts on human health in relation to changes to the sound environment and air quality. It is requested that the proponent complete the checklists provided in these guides (Appendix B in the noise guide and Appendix A in the air quality guide) to assist Health Canada and other participants in verifying that the main elements of a noise or air quality Impact Assessment have been completed and in identifying the location of this information in the impact study. These checklists will facilitate Health Canada's review of the Impact Statement and will be particularly useful if analyses on these aspects are found in several sections of the Impact Statement.

12.2. Groundwater and surface water

With respect to the potential effects of the project on the physical hydrogeological system, the Impact Statement must:

- describe any interactions between the project and groundwater and surface water, including the following details, if relevant;
- locations of interaction with groundwater;
- describe possible changes to groundwater flows and any effects attributable to the changes;
- identify nearby wells, providing criteria for the spatial boundaries considered, and describe the potential for the quantity and quality of well water to be affected.
- The proponent must also indicate whether the bodies of water and watercourses from which water is to be withdrawn provide habitat for fish or are frequented by fish, as well as the potential effect of water withdrawals (and water discharges, if applicable) on fish and fish

habitat, including the quantity and quality of water withdrawn from the natural environment (available flow or volume), any treatment carried out on this water (e.g. addition of tracer), and the conditions under which the water is returned to the receiving water (return points, techniques used, volumes, flows, contaminant durations), as well as the effects on the water body or watercourse;

- describe contaminants potentially associated with the project which could affect water quality;
- provide an assessment of off-site migration of affected groundwater and an analysis of contaminant mitigation capabilities within the hydrogeological units in the project area in order to identify the potential for surface water contamination;

With respect to the potential effects of the project on the quality and quantity of waters in the receiving environment, the Impact Statement must:

- describe the effects of the project on water quality in the receiving environment, including those associated with watercourse and water body crossings, diversions, dewatering, water withdrawal and wastewater return to the receiving environment, seepage from piles of material and other tailings, overflows from excavation or drilling pits, and surface runoff from work surfaces;
- for each water body and watercourse likely to be affected by the project activity(ies), describe the program for assessing surface water and groundwater quality during the work, including the selection and location of sampling sites upstream and downstream of the work, the physico-chemical parameters and chemical constituents that will be measured, the duration and frequency of monitoring, the sampling protocol and analysis protocol, and the quality assurance and quality control measures. Where applicable, the parameters measured should include a comparison to the CCME Canadian Water Quality Guidelines criteria;
- submit any water quality and quantity management plan associated with the work, including proposed mitigation measures and rationale to support the effectiveness of the proposed measures; With respect to the potential effects of the project on water quality resulting from acid rock drainage or metal leaching, the Impact Statement must identify (and present on maps) areas with potential for acid rock drainage and describe the effects of exposure resulting from the project;
- provide an estimate of the potential for materials removed during excavation and drilling to be sources of acid rock drainage or metal leaching, the areas and volumes affected, and an estimate of the time that could elapse before acid rock drainage or metal leaching occurs;
- describe the methods used and results in order to estimate acid rock drainage and metal leaching on samples of rock material from excavation and drilling; and
- describe methods to prevent, manage, and control acid rock drainage and metal leaching during construction, operation, closure, and decommissioning.

The proponent should refer to Health Canada's "Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality " to ensure that it provides the information and analysis that Health Canada considers necessary to assess the project's impacts on human health in relation to changes to water quality. It is requested that the proponent complete the checklist provided in this guide (Appendix A) to assist Health Canada and other participants in verifying that the main elements of a water quality Impact Assessment have been completed and in identifying the location of this information in the impact study. This checklist will facilitate Health Canada's review of the Impact Statement and will be particularly useful if analyses on this aspect are found in several sections of the Impact Statement.

12.3. Riparian, wet and terrestrial environments

The Impact Statement must:

- describe the interactions between the project and the riparian and terrestrial environments and wetlands, including the following details, if relevant;
- describe the predicted direct positive or adverse effects as well as unintended and cumulative effects on riparian, wetland and terrestrial biodiversity parameters, effects of fragmentation and changes to regional biodiversity that may be caused by all project activities, including, but not limited to:
- identify impacts on the ecological functions of wetlands, including those that may affect their ability to perform hydrological, biogeochemical, climatic or habitat-related functions for migratory birds, species at risk listed under SARA, ESA and TVSA, and species assessed by the COSEWIC as being at risk;
- describe the methodology used to determine impacts;
- provide a comprehensive description of changes related to landscape disturbance, including, but not limited to, habitat fragmentation, alteration of riparian strips and the effects of the project on areas of soil instability;
- describe any hydrological or water flow changes, either permanent or temporary, that could alter moisture regimes or drainage conditions, and describe the impacts on vegetation and wetlands, including impacts on fish and fish habitat where applicable;
- describe any changes in soil quality, compaction, erosion, and soil loss that could result in a loss of soil productivity;
- describe methods for clearing and maintaining the pipeline right-of-way and the potential impact on species, biodiversity and culturally important species;
- describe the impact of pipeline construction on nearby eskers and the potential decrease in lichen growth that could impact caribou habitat;
- describe the nature of the surface formations as well as the depth at which the pipeline will be installed including, but not limited to, a map (at the appropriate scale) of the eskers found therein; and

- describe the effects on soils and sediments of trenching, drilling, underground infrastructure burial and compaction, stream and water body crossings, dewatering, diversions, and water withdrawals (e.g. hydrostatic testing). These effects include changes in topography, erosion, altered bank slopes and re-suspension of sediment;
- describe historical land use and the risk of soil and sediment contamination as well as the potential for loss of soil fertility. Describe any known or suspected soil contamination in the study area which may be re-suspended, discharged or otherwise disturbed as a result of the project;
- describe any positive changes (e.g. offsets that result in revegetation, new wetlands, etc.).

13. Effects on valued components - Environment

13.1. Fish and fish habitat

The Impact Statement must clearly identify, at all stages of the project, which components of the aquatic environment will be affected and provide a description of the anticipated effects (positive and negative, direct and indirect, temporary and permanent) on fish and fish habitat within the meaning of subsection 2(1) of the *Fisheries Act*. Without limitation, for each water body and watercourse affected by the project, the following must be documented and considered in the determination of effects:

- the crossing techniques and the criteria for determining the proposed techniques for each crossing;
- geomorphological changes and their effects on hydrodynamic conditions, fish and fish habitat (e.g. encroachment into the aquatic environment, substrate modification, dynamic imbalance, clogging of spawning grounds, etc.);
- changes in hydrological and hydrometric conditions on fish habitat and the life cycle activities of fish species (e.g. reproduction, rearing, feeding and growth, movement and migration, winter refuge), including, where appropriate, on species at risk; For example, any changes in fish passage conditions and how unimpeded fish migrations and movements will be maintained in the watercourses during and after pipeline construction should be described.
- the impact of the work on riparian areas that could affect fish and fish habitat. For example, the removal or alteration of shoreline vegetation at watercourse and watercourse crossings will impact fish and fish habitat by increasing runoff and sediment transport;
- the risk of fish mortality associated with noise caused by project activities in or near the aquatic environment (e.g. blasting), or by fish entrainment during water pumping (e.g. for placement and maintenance of cofferdams in the aquatic environment) or water withdrawal activities (e.g. hydrostatic testing). Where appropriate, an assessment of mortality should be provided (species, number of individuals, etc.);

- risks associated with the introduction of deleterious substances into the aquatic environment frequented by fish (e.g. drilling mud). Emphasis should be placed on prevention;
- the risks associated with the introduction of invasive species into the aquatic environment frequented by fish. Emphasis should be placed on prevention;
- the effects on fish and fish habitat of discharges to the aquatic environment of waters used for hydrostatic testing;
- anticipated changes in the composition and characteristics of provincially or federally listed fish populations and aquatic species at risk;
- any alteration and use of habitat (including the ability to access habitat), including, where applicable, the residence and critical habitat of species at risk;
- contaminant levels in harvested species and their prey, with a focus on traditional foods harvested by Indigenous peoples; and
- any other effects that may affect fish and fish habitat as a result of the project.

The Impact Statement must also take into account and include:

- an examination of the correlation between construction periods and sensitive periods for fish (e.g. reproduction), and any potential effects due to overlapping periods;
- an assessment of the risks of introduction and possible intrusion of invasive aquatic species due, for example, to the use of the same equipment and apparatus for crossing water bodies and watercourses;
- describe any need for a *Fisheries Act* authorization or a permit under the *Species at Risk Act* and describe any review of Fisheries and Oceans Canada guidance documents;
- where applicable, an assessment of anticipated habitat losses (temporary or permanent) should also be provided in the Impact Statement in terms of area, sensitivity of habitat lost (e.g. resilience of affected species and their dependence on habitat, habitat scarcity, habitat resilience, contribution to fisheries productivity, species at risk, etc.) and significance (e.g. magnitude, intensity and persistence). Habitat losses must be clearly located and described. It is recommended that the information be collected in the form of a map at appropriate scales, as well as in the form of a table; and
- describe any interactions between the project and fish and fish habitat, including the following details, if relevant.

13.2. Birds, migratory birds and their habitat

The Impact Statement must:

- describe the interactions between the project and birds, including the following details, if relevant:

- describe direct, incidental and cumulative positive and/or adverse effects to migratory birds, including population level effects that could be caused by all project activities, including:
  - site preparation or vegetation removal;
  - deposit of harmful substances in waters that are frequented by migratory birds;
  - flaring of gas; and
  - site reclamation.
- see A framework for the scientific assessment of potential project impacts on birds in Appendices 2 and 3 for an overview of the potential impacts of pipeline projects on birds (http://publications.gc.ca/site/eng/9.567093/publication.html);
- Analyze the predicted effects for (1) all birds, (2) each CV, and (3) priority BCR species, and include relevant impacts described in Appendices 2 and 3. Include separate analyses for each activity, component and project phase. Consider sources of error for all analyses to ensure that the final impact estimates indicate the best estimate of precision;
- Wherever possible, non-linear, indirect and synergistic responses to the project should be explicitly explored;
- any assumptions regarding relocation should be justified using scientific references and surveys should provide evidence that there is available habitat to allow relocation under a variety of population scenarios. For example, it should be clear that a growing population will not be limited by habitat loss along the PA;
- describe short- and long-term changes to habitats and food sources for migratory and non-migratory birds (types of cover, ecological unity of the area in terms of quality, quantity, distribution, and functions) as well as a distinction made between the two categories of birds, including losses, structural changes, and fragmentation of riparian habitats (e.g. aquatic grasslands and intertidal marshes), terrestrial environments (e.g. grasslands, woodlands, old-growth forests, post-fire areas), and wetlands frequented by birds;
- consider important habitats, including:
  - eskers,
  - forests,
  - riparian buffer zones,
  - ombrotrophic or minerotrophic bogs,;
  - other wetland areas, and
  - open waters.
- describe changes in bird-habitat relationships, biodiversity, abundance and density of the avian community which involve various ecosystems and habitat types;
  - particular attention will have to be paid to the change in detection before and after the project is carried out. For example, linear structures allow larger detection distances as described in the article (Yip et al., 2017,“Experimentally derived detection distances from audio recordings and human observers enable integrated analysis of point count data”). Therefore, any estimates of abundance or occurrence should reflect differential detection;

- describe the change in mortality risk, including as a result of the collision of migratory birds with gas flaring emissions, project infrastructure, vessels and vehicles;
- Surveys should cover a time window that includes a variety of uses of the project area by day and night species;
- Indirect impacts must be considered, such as increased movement of predators, in assessing and predicting mortality impacts.
- describe the incidental effects caused by increased disturbance (e.g. sound, light, presence of workers), relative abundance of movement considering critical periods for birds, including breeding, migration and overwintering.
- If a temporary relocation hypothesis is made during the operational phases of the project, support the hypothesis with scientific evidence or through study and monitoring within the PA as the project proceeds.
- describe the potential direct effects of contaminants and bioaccumulation of contaminants on resident and migratory birds, including those that may be consumed by Indigenous peoples.

The proponent is encouraged to treat the following types of birds as valued components, and to engage discussion of potential impacts accordingly:

- waterfowl,
- birds of prey,
- shorebirds,
- forest birds,
- large peatland birds (such as bogs and fens),
- other wetland birds,
- endangered bird species*. Each of these species should be considered separately as a VC (e.g. Barn Swallow, Canada Warbler, Chimney Swift, Common Nighthawk, Eastern Whip-poor-will, Barrow's Goldeneye, Eastern Wood-Pewee, Wood Thrush, Evening Grosbeak, Olive-sided Flycatcher, Short-eared Owl, Yellow Rail, Rusty Blackbird, Peregrine Falcon, etc.).

*Note that in all of the following sections, bird species at risk are included in the bird sections and information about them is not repeated in the species at risk sections.

13.3. Terrestrial wildlife and their habitat

The Impact Statement must describe the interactions between the project and terrestrial wildlife and their habitat, including the following details:

- describe the potential direct, incidental and cumulative adverse effects on other wildlife and wildlife habitat, including population-level effects that could be caused by all project activities, including any linear access corridors (roads, transmission lines, rights-of-way), particularly in the vicinity of wetlands, lake and riparian habitats and on migration corridors;

- describe the potential direct effects of contaminants and bioaccumulation of contaminants on terrestrial wildlife, including those that may be consumed by Indigenous peoples;
- describe methods for clearing and maintaining the pipeline right-of-way and the potential impact on species, biodiversity and culturally important species;
- The provincial governments of Quebec (MFFP) and Ontario (MECP) should be considered as a source of information on appropriate methodologies for predicting impacts on wildlife;
- describe the effects on terrestrial wildlife biodiversity considering biodiversity parameters, the effects of fragmentation and changes to regional biodiversity;
- describe the potential adverse effects of the designated project on species identified as important to Indigenous peoples and local communities, and on the habitat of those species that are not currently listed under the *Species at Risk Act* or provincial statutes;
- provide an evaluation of the effect of any new road access or right-of-way on wildlife mortality risk and movement patterns;
- describe changes to the primary habitat of species important to current use of lands and resources for traditional purposes;
- The deterioration or loss of habitats that may affect the biodiversity of environments by: the introduction of invasive species, loss and fragmentation of forest cover, increased wildlife predation along the pipeline right-of-way during construction, operation and closure phases, degradation of wildlife populations due to increased hunter access to the pipeline right-of-way and to roads and corridors.

13.4. Species at risk

The Impact Statement must describe the interactions between the project and species and ecological communities at risk, including the following details:

- describe the potential direct, incidental and cumulative adverse effects of the project on species at risk listed under Schedule 1 of the *Species at Risk Act* and, where applicable, on their critical habitat (including its extent, availability and the presence of biophysical attributes);
- the analysis of potential effects should be done for each species at risk. To fully understand the effects or benefits of one alternative over another, all parameters relevant to species at risk should be considered;
- separate analyses must be included for each activity, component and phase of the project; and
- it is necessary to carry out post-construction follow-ups to verify the apprehended impacts.
- Concerning the description of the effects on **BATS:**
    - Consider all impacts on feeding habitats, hibernacula, resting sites, maternity wards and movement corridors when assessing effects on local and regional populations.

- Identify potential resting areas, maternity wards, hibernacula, feeding habitat and movement corridors in the local area, as well as the project's potential impacts on these habitats or on their particular functions for bats. Where artificial resting places (i.e. buildings) are rare on the landscape, special attention should be paid to identifying natural structures.

- Concerning the description of the effects on **CARIBOU:**
  - Provide an assessment of potential negative impacts on boreal caribou habitat (e.g. at the QC-1 range scale).
  - Assess the effects of all linear disturbances (e.g. new road access or rights-of-way) on caribou, including movements between seasonal habitats, to account for functional habitat loss and effects of increased predation. In this assessment, apply a 500-metre buffer to the mapped anthropogenic features to adequately represent the combined effects of increased predation and trends in disturbance trends on the critical habitat of caribou population at the national scale (Environment Canada, 2011: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/ri_boreal_caribou_science_0811_eng.pdf);
  - Use population-level modelling to assess the effects of proposed disturbance on caribou at the scale of federal range boundaries (Qc-1).
  - With respect to the effects on undisturbed habitat at the range scale:
    - Provide an account (and GIS file if available) of added project disturbance using a 500-metre buffer, using the following formula:
  - For range QC-1 with less than 65% undisturbed habitat: (project footprint + 500-metre buffer) – (area of permanent alterations + 500 metres). Disturbed habitat is defined as habitat exhibiting (i) anthropogenic disturbance visible on 1:50,000 Landsat imagery, including habitat within a 500-metre buffer of anthropogenic disturbance and/or (ii) fire disturbance within the last 40 years, based on data provided by provincial and territorial jurisdictions. Permanent alterations represent existing developments within a range such as industrial and urban developments, permanent infrastructure, and graded or paved roads that currently or potentially lack the biophysical characteristics of critical boreal caribou habitat.
    - Determine whether the project is expected to compromise the ability of ranges to be maintained at the disturbance management threshold and provide a rationale for the conclusion.
  - With respect to effects on biophysical attributes as defined in Appendix H of the Boreal Caribou Recovery Strategy:
    - Determine whether the project is expected to remove or alter biophysical attributes necessary for the recovery or survival of boreal caribou and provide a rationale for the conclusion.
  - With respect to effects on connectivity:
    - Determine whether the project is expected to result in a reduction of connectivity within or between the ranges and provide a rational for the conclusion. Evaluate habitat

and connectivity at the local, regional and range scales using quantitative methods (e.g. habitat quality analysis, etc.). In addition, where telemetry data are available, evaluate movements of collared individuals using quantitative methods (e.g. step analysis) to determine existing movement corridors and how these may be affected by project development.

  - With respect to the effects of predation:
    - Determine whether the project is expected to result in an increase of predator and/or prey access to undisturbed areas and provide a rationale for the conclusion.
  - With respect to the effects on individual and population status at the range scale:
    - provide the best available information from the MFFP regarding population size and trend;
    - provide an assessment of the potential adverse effects of the project on population status (size and trend) at the federal range scale;
    - provide an assessment of the potential adverse effects on boreal caribou (e.g. sensory disturbance, mortality, pollution), including legal harvesting by Indigenous peoples.
- describe the potential direct, indirect and cumulative adverse effects of the project on species protected under provincial legislation, on ecological communities, and on species assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna), as well as on the potential habitat of these species that are not currently listed under the *Species at Risk Act*;
- identify critical periods (e.g. denning, rutting, spawning, calving, breeding, resting), setback distances or other restrictions related to these species;
- identify provincial, territorial or federal authorizations or permits that may be required in relation to the species at risk;
- provide survey results and detailed mapping of each species at risk and their habitat, including significant habitat features for all federal lands;
- clearly identify the locations of federal and non-federal lands within the study area and differentiate between them in the presentation of information regarding species at risk:
  - for example, total habitat disturbance for boreal caribou should be presented at the range scale, but it should also be presented in a manner that clearly indicates critical habitat disturbance within federal lands.
- describe the discussions held with the appropriate federal authority (Environment and Climate Change Canada, Fisheries and Oceans Canada, Parks Canada) to obtain a SARA permit;
- describe all feasible measures that will be taken to avoid or mitigate the impacts of the project on the species and their critical habitat;
- Demonstrate that avoidance and mitigation measures will be applied for species at risk. Recovery strategies will provide information such as population and distribution objectives, and strategic direction for recovery;

- describe the residual effects that are likely to result from the project after avoidance and minimization measures have been applied, including the extent, duration and magnitude of the effects on:
  - the number of individuals killed, harmed and harassed; and
  - the number of residences damaged or destroyed.
- describe the surface area, biophysical attributes and location of habitat, including critical habitat affected (e.g. destroyed, permanently altered, disturbed);
- describe all feasible measures that would be taken to eliminate the effect of the work or activity on species and their habitat, including critical habitat; and
- provide an account on how the project and mitigation measures are consistent with the recovery strategy, action plan or management plan for the species.

13.5. Climate Change

The following requirements are based on the *Strategic Assessment of Climate Change* (SACC) document developed by ECCC. The draft SACC) provides guidance on climate change information requirements throughout the impact assessment process. The impact assessment should:

- provide a description of each of the project's main GHG emission sources;
- provide the annual estimate of GHG emissions of each source;
- provide a qualitative description of the positive and adverse impacts of the project on carbon sinks, including modification and destruction of human environments;
- provide a quantitative estimate of net GHG emissions and the intensity of annual emissions for each year of the project lifecycle, including an assessment of the degree of uncertainty, according to Section 3 of the preliminary version of the Strategic Assessment on Climate Change. In this calculation include fugitive and discharge emissions and consider the scenarios where turbines of natural gas compression stations are powered by natural gas or electricity;
- indicate the GHG emissions as a percentage of total emissions, as a percentage of reported provincial and national GHG emissions and as a percentage of government GHG reduction targets;
- describe how the project can contribute to Canada's efforts to reduce GHG emissions, where applicable (e.g. the impact statement could explain how the project would cause reductions of emissions in Canada by avoiding emissions from other sources);
- inventory and explain the legislation, regulations and policies relating to climate change that apply to the project's GHG emissions and specify to what extent;
- indicate the GHG emissions as a percentage of the total GHG emissions according to the sector and the percentage of provincial and national GHG emissions reported;
- describe how the designated project could have an impact on global GHG emissions, including the following scenarios:

- in the event of a carbon leakage risk if the project were not built in Canada, the impact statement could include an explanation of the probability and the carbon leakage if the project were not approved;
- if a project allowed international displacement of emissions, the impact statement could describe how the project is likely to cause global reductions of emissions.

- Conduct an assessment of the GHG emissions upstream of the project, including Parts A and B, as described in the SACC and which includes the following components. Additional information for the assessment of upstream emissions is provided in Part 2 – Annex 1:
  - submit a quantitative estimate of the upstream GHG emissions associated with the project, based on the maximum capacity of the project (new project), including information on the method, the data, the assumptions and the approach to estimate upstream GHG emissions;
  - provide a qualitative analysis of the effect of the growth of upstream GHG emissions, describing the conditions according to which the estimated upstream emissions could occur, regardless of whether the project is carried out.
  - If the projected upstream GHG emissions do not exceed 500 kt eq. CO2 per year, provide a justification explaining this forecast.
- In addition to this factor, also consult the CER Interim Filing Guidance (dated August 22, 2019) to obtain other guidance on GHG emissions and climate change.

14. Effects to Valued Components - Human Health

The social, economic, health and environmental impacts are interrelated. Changes in one of these areas often cause changes in the others. In the context of the projected changes to the natural environment, and the social and economic conditions arising from the project, the Proponent must assess the adverse and positive effects of the project on human health. The interconnections between human health and the other valued components and the interactions between the effects must be described.

The Proponent must describe how Indigenous and community knowledge was used to collect reference data and address the effects on health, and subdivide the source of community knowledge, as well as the social, economic and health data, according to the representation by gender, age and other relevant identity factors for the community, in order to support the determination of disproportionate effects by implementation of GBA+. During assessment of the effects, the analysis must consider the circumstances in which subgroups representative of diversity could, due to their special situation in a community, suffer more severe adverse effects of the designated project than others, or not benefit from potential impacts.

The assessment must illustrate an understanding of the connections and the paths followed by the effects, so that when a change is anticipated in one area, it is understood what other effects or consequences may be felt in the other areas. The application of the health determinants approach to the assessment of the effects on human health will support the determination of these connections and the disproportionate effects on subgroups.

All the interconnections between human health and the other valued components and the interactions among the effects must be described. A health impact assessment [10](HIA) produced according to best practices and conducted by qualified persons would be appropriate to understand the potential positive and adverse effects on the socioeconomic factors, as well as the biophysical factors generally included in an environmental assessment. The HIA considers the community's concerns and generally incorporates a "gender-based analysis plus" to indicate how each project's activities can affect the subgroups of the population in different ways.

The impact statement must:

- employ best practices in the health impact assessment methods (refer to Health Canada 2019. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment - https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-risk-assessment.html ;
- provide an assessment of the adverse effects on human health or the changes made to the reference health profile based on the changes made to the environment, health, social and economic conditions, by putting the emphasis on the effects on the outcomes for health, the risks or the determinants of health, particularly considering potential changes in:
  - air quality;
  - noise exposure and the effects of vibrations;
  - current and future availability (including contamination or quality) of harvested foods (traditional foods);
  - current and future availability (including contamination or quality) of drinking water and water used for recreational and cultural purposes);
- describe how the contaminants related to the project potentially in the water, air or soil can be absorbed in traditional foods (i.e. foods that are trapped, fished, hunted, harvested or grown for subsistence, cultural or medicinal purposes);
- identify all the potential routes of exposure to contaminants;
- provide a detailed justification for every contaminant of potential concern (COPC) or exposure route that would be excluded and/or eliminated from the assessment of the human health risks;

[10] Combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population." (European Centre for Health Policy, 1999 - http://www.healthedpartners.org/ceu/hia/hia01/01_02_gothenburg_paper_on_hia_1999.pdf).

- determine the anticipated effects of the project on the quality and quantity of groundwater or surface water used for domestic purposes;
- describe and quantify the health risk related to exposure to COPC via consumption of traditional foods;
- provide a justification if it is determined that a contamination risk assessment of harvested food (traditional foods or other exposure routes, such as inhalation) is unnecessary or if certain contaminants excluded from the assessment;
- produce a statement of the problem** to determine if a more thorough toxicological human health risk assessment (HHRA) is required. The Proponent must provide a justification or an explanation if the formulation of the problem includes that a more thorough toxicological human health risk assessment*** is not justified;
  - Statement of the problem: Stage of the HHRA consisting of identifying the main factors to consider in the risk assessment. It briefly addresses the following factors:
    - identification of the boundaries of the study;
    - identification of the current and future contaminants of potential concern[****](COPC);
    - Contaminant of Potential Concern: Any chemical substance for which the concentration in an environmental medium is likely to be high due to the project's activities may first be considered as a contaminant of potential concern (COPC). However, if it is established that the sum of the modelled concentrations and the background concentrations is below the guidelines, standards or criteria - based on health protection - the statement of the problem stage of the risk assessment may conclude that it is unnecessary to treat this chemical substance as a COPC in a quantitative risk assessment.
    - identification of the current and future human receptors;
    - identification of the current and future exposure routes;
    - development of the conceptual site model illustrating the connections existing between the COPC, the receptors and the exposure routes.

  - Toxicological human health risk assessment: The toxicological human health risk assessment addresses the effects on the health of persons exposed to biophysical stressors, particularly increased concentrations of chemical substances present in an environmental medium and linked to various phases of a proposed project (construction, operation, decommissioning and post-closure, as the case may be);
- if a toxicological human health risk assessment is performed, the assessment must address all the exposure routes to the contaminants of potential concern in order to characterize adequately the potential biophysical human health risks. A multimedia human health risk assessment could be considered and performed for any contaminant of potential concern presenting a determined risk and multiple exposure routes;
- describe and quantify the potential effects on mental and social welfare (e.g. stress, depression, anxiety, feeling of safety);

- describe and quantify the activities related to the project, the contaminants of potential concern, the nuisances and the environmental, social and economic changes that could be sources of adverse effects on human health and the potential human receptors;
- describe and quantify any threshold used for analysis of the physical effects and indicate if different thresholds have been considered for vulnerable populations, including thresholds based on gender and age. Provide a justification for any applicable threshold that its not used;
- in situations where emissions in the atmosphere, in water or in the form of noise related to the project comply with the local, provincial, territorial or federal guidelines, when public concerns about the human health effects have been raised, provide a description of public concerns and how they have been or must be addressed;
- identify the possibilities of avoidance of certain drinking or recreational water sources by the Indigenous peoples due to the perception of contamination;
- select the drinking water parameters according to the strictest applicable standards and recommendations; determine the project's anticipated visual or aesthetic effects on current land use in the study area;
- identify any emotional or social stress factor that may result from the project phases, particularly:
  - the concerns regarding public safety raised by construction or by accidents or failures related to operation of the facilities;
  - disturbance of normal daily activities.
- Describe the potential direct and indirect/unforeseen effects on access and barriers to health services, including the increased use of health services and related social services in the relevant communities, and examine the barriers to access;
- describe the potential effects on access to health services, including the increased use of health services and related social services in the relevant communities;
- concerning food security, describe the effects on the availability, use and consumption of harvested food (traditional foods) and the health impacts of these effects;
- describe how community and Indigenous knowledge have been used to assess the human health effects;
- apply GBA+ to all health effects, including health services, and document how the potential effects or the changes to human health conditions could be different for subgroups representative of diversity, including the Indigenous peoples and other relevant community subgroups (e.g. women, youth, elders); ensure that the special needs of these groups are satisfied;
- apply GBA+ to all health effects and document how the potential effects or the changes to human health conditions could be different for subgroups representative of diversity, including the Indigenous peoples and other relevant community subgroups (e.g. women, youth, elders);

- describe any positive effect on health (e.g. resulting from improvement of economic possibilities or better access to services).

The Proponent should refer to Health Canada's "Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessments" to ensure the information and analyses are provided that Health Canada considers necessary to assess the project's human health impacts in relation to exposure to chemical contaminants by different exposure routes. The Proponent is asked to complete the checklist provided in this guide (Schedule B) to help Health Canada and the other participants verify if the main factors of the toxicological human health risk assessment have been completed and identify the location of this information in the impact statement. This checklist will facilitate examination of the impact statement by Health Canada and will be particularly useful if the analyses of this aspect are found in several sections of the impact statement. A detailed explanation must be provided if the Proponent does not apply the assessment approaches and methods suggested by Health Canada or if it determines that such an assessment is not justified.

15. Effects on Valued Components — Social Conditions

In the context of the projected changes to the biophysical environment and the health and economic conditions arising from the designated project, the Proponent must assess the project's effects on social conditions. The interconnections between the valued social components and other valued components and the interactions between the effects must be described.

The valued components that require an assessment are set out below, including certain factors and indicators to be included in the analysis. If, after consulting the communities and conducting a more thorough analysis, the Proponent determines that the information and the valued components set out below could be organized better and presented in another way, it may do so by providing an explanation and a justification of these changes.

The Proponent must describe how Indigenous and community knowledge was used to collect reference data and address the social effects, and subdivide the source of community and Indigenous knowledge, subdividing it by gender, age and other relevant identity factors for the community, in order to support the determination of disproportionate effects by implementation of GBA+. During assessment of the effects, the analysis must address the circumstances, in the communities, in which subgroups representative of diversity could, due to their special situation, suffer more severe adverse effects of the designated project than others, or not benefit from potential impacts.

Since this applies to the assessment, the analysis should describe the objectives of the local or regional land use plans or the local or regional development plans and the extent to which the

project should be aligned with these plans to avoid or improve the social impacts. Concerning the valued components set out below, the assessment of the effects should address the possibilities of improving the impacts for the local communities.

15.1. Services and Infrastructures

The impact statement must:

- give an overview of the anticipated sources of the project's sociocultural effects on the community;
- describe the anticipated interactions between the workforce assigned to the project's construction, operation and maintenance, on the one hand, and the local communities, businesses, and residents, on the other hand;
    - be produced at the community level instead of the individual level to protect privacy and include local, regional and Indigenous social and cultural service providers, agencies and institutions, as needed;
- address the potential adverse and positive effects of changes in social conditions, particularly:
    - food security;
    - Income inequalities;
    - changes on the community scale that influence social conditions due to population growth, workers' camps, economic activity and the cost of living, among other factors;
    - the non-commercial and commercial economy;
- describe the effects of immigration and emigration, including changes in the social and cultural composition of the communities concerned and changes in the populations;
- determine if the social divisions may intensify after the project;
- address the potential social effects associated with the increase in disposable income, including the potential effects on the cost of living, the adverse and positive changes in lifestyle, and the allocation of benefits among the persons affected;
- describe all the anticipated effects on language;
- describe the changes made to the landscapes after the project and the potential effects on the community's welfare;
- consider the risk of stress on community, family and household cohesion, alcoholism and drug addiction, or illegal or potentially disruptive activities;
- apply GBA+ to the information related to community welfare and document how the potential effects of the changes to community welfare conditions could be different for subgroups representative of diversity, including the Indigenous peoples and other relevant community subgroups (e.g. women, youth, elders);

- describe the anticipated effects on local and regional services and infrastructure components in the study area, including the positive and adverse effects on:
    - shelter (e.g. accessibility, availability, relevance), including camping facilities;
    - recreation (e.g. hunting, fishing, etc.) and parks;
    - waste disposal;
    - road infrastructure and road safety;
    - police and firefighters;
    - educational institutions and daycare;
    - ambulance and healthcare services;
    - utilities;

  describe any requirement for spending by the government to the Proponent for new or expanded services, facilities or infrastructure components resulting from the project's effects.

15.2. Use of Land and Resources

The impact statement must:

- describe the possible interactions of the designated project with local and regional activities for use of land and resources, including the positive or adverse effects on:
    - the transportation and utility corridors;
    - residential land use;
    - forest operations;
    - commercial outfitters;
    - agriculture, including the anticipated effects on livestock health and productivity;
    - other land uses;
- describe the anticipated effects on recreation (e.g. hunting, fishing, wildlife observation, aesthetic pleasure) by the community and the Indigenous peoples, including the effects on:
    - access to resources;
    - the quantity and quality of resources;
    - the overall experience acquired in the context of recreational activities, including the effects of noise;
- describe the changes made to the landscapes after the project;
- determine the anticipated effects of the project on the quality and quantity of groundwater or surface water used for recreational uses.

15.3. Navigation

The impact statement must:

- provide a list of waterways within, over, below or through which or on which a power transmission corridor could pass, and specify the proposed crossing method;

- provide a list of the related components that will be constructed within, over, below or through waterways, or on such waterways, in support of a power transmission project (e.g. temporary or permanent bridges);
- describe the users of the waterways who could be affected and describe the consultations conducted with users of the waterways or Indigenous peoples regarding the use of navigation, the problems raised and how the problems were solved;
- describe the project's effects on navigation and the safety of navigation.

15.4. Community Welfare

The impact statement must:

- address the potential positive and adverse effects of changes in social conditions, particularly:
  - food security;
  - Income inequalities;
  - changes on the community scale that affect social conditions due to population growth, workers' camps, economic activity and the cost of living, among other factors;
  - the non-commercial or commercial economy;
- describe the effects of immigration and emigration, including changes in the social and cultural composition of the communities concerned and changes in the populations and other risks, such as a greater propagation of sexually transmitted infections or HIV and gender-based violence (e.g. harassment or human trafficking);
- determine if the social divisions could intensify after the project;
- study the barriers preventing people from benefiting from the positive effects on social conditions and how these barriers are accentuated among the various subgroups;
- address the potential social effects associated with the increase in disposable income, including the potential effects on the cost of living, the positive and adverse changes in lifestyle, and the allocation of benefits among the persons affected representative of diversity;
- describe all the anticipated effects on language;
- describe the changes made to the landscapes after the project and the potential effects on the community's welfare;
- consider the risk of stress on community, family and household cohesion, alcoholism and drug addiction, or illegal or potentially disruptive activities;
- apply GBA+ to the information related to community welfare and document how the potential effects of the changes to community welfare conditions could be different for subgroups representative of diversity, including the Indigenous peoples and other relevant community subgroups (e.g. women, youth, elders).

15.5. Structure, Site or Thing of Historical, Archaeological, Paleontological or Architectural Importance

The impact statement must:

- in the event that work may disturb the soil, on the surface or underground, is carried out on Crown lands, an archaeological potential study shall be conducted for the entire Crown territory affected. Based on the recommendations of this study, field work (visual inspection without snow cover, archaeological inventory, or other) could be necessary. Depending on the findings, this expertise could lead to mitigation measures related to the findings obtained, which can take the form, for example, of intensive digs at a given site or a proposal for modification of the anticipated route.
- on lands under provincial jurisdiction, work that could disturb the soil on the surface or undergrounds should comply with the Quebec *Cultural Heritage Act* and the *Archaeological Research Regulation*.

16. Effects on Valued Components — Economic Conditions

In the context of the projected changes to the biophysical environment and the health and social conditions arising from the designated project, the Proponent must assess the project's effects on the valued economic components. The interconnections between the valued economic components and other valued components and the interactions between the effects must be described.

The Proponent must describe how community and Indigenous community knowledge was used to collect reference data and address the economic effects, and subdivide the source of community and Indigenous knowledge, representing it by gender, age and other relevant identity factors for the community, in order to support the determination of disproportionate effects by implementation of GBA+. During assessment of the effects, the analysis must address the circumstances, in a community, in which subgroups representative of diversity could, due to their special situation, suffer more severe adverse effects of the project than others, or not benefit from potential impacts.

The assessment of the economic effects must consider the time scale for construction, operation and the next stages, in order to assess the possibility of boom and bust cycles that could be associated with the project and avoid these cycles.

The impact statement must include:

- a description of the plans intended to encourage the possibilities of local employment, procurement and contracts, including for the underrepresented groups, and indicate the capacity of local businesses to bid to obtain contracts related to the project.

- a description of the plans intended to encourage recruitment, retraining and maintenance in place of underrepresented groups in the project, and analyze the potential for increasing employment for women and other subgroups and local workers more generally;
- a description of any training or education program or any bursary the Proponent applies to improve the employment possibilities for local residents, including for the underrepresented groups;
- if applicable, a description of the workforce retraining plans associated with the project in terms of diversity and inclusion;
- the anticipated effects of the project on the quality and quantity of groundwater or surface water used for commercial purposes;
- the anticipated effects of the project on the availability and quality of land and the short-term and long-term disturbance of the related sectors of activity; an estimate of the impacts on the revenues of local, regional, provincial, territorial or federal administrations, or of Indigenous peoples, coming from taxation, royalties, revenue sharing and other means during construction and operation, including a quantitative assessment of these impacts;
- an estimate of the project's direct and indirect effects on the economy resulting from the project's potential environmental impacts;
- an examination of the project's impact on the federal and provincial gross domestic product;
- an assessment of the net economic benefits for the Canadian economy as a whole, which necessitates a detailed annual cash flow forecast for the duration of the project, including a sensitivity analysis showing the impact of the changes of the discount rate, prices, capital and operating costs or other significant parameters;
- an analysis of the project's potential effects on the traditional economy, including the loss of traditional economies and jobs;
- an analysis of the potential changes in property values;
- an analysis of the potential changes in the cost of living resulting from the project.

The impact statement must:

- apply GBA+ to all effects and document how the potential effects or the changes in the economic context could be different for specific subgroups, including the Indigenous peoples and other relevant community subgroups (e.g. women, youth, elders).

16.1. Training

The impact statement must provide:

- a description of the training programs the Proponent will support to improve employment opportunities for local and Indigenous residents;

- a summary of the training commitments made, if the Proponent has prepared an economic benefits plan or has made specific cooperation agreements with the communities or the Indigenous peoples.

16.2. Employment

The impact statement must:

- provide the number of workers assigned to construction and operation;
- provide an estimate of the potential changes in local employment and the possibility of labour shortages in certain sectors of the community after the project;
- provide an estimate of direct, indirect or induced income or wages, and the allocation of this income or wages, resulting from the project's expenditures during construction, operation and decommissioning;
- determine the jobs likely to be in demand due to the project and the availability of local workers who can hold these jobs;
- provide information in the context of the current employment rates and the community's economic welfare;
- provide a description of the effects associated with upstream extraction and downstream production;
- provide an analysis of the project's requirements for skilled and unskilled labour, including the availability and capacity of the local workforce;
    - if applicable, describe the plans and the justification for hiring of temporary workers to make up for the shortage of labour and skills;
- provide a description of the plans with the aim of encouraging local and Indigenous employment;
- describe the studies, training and hiring practices, including the participation and contribution of the local training networks, which encourage employment of the local population;
- provide an estimate of the anticipated levels of participation of the Indigenous peoples in the project in relation to the project's total requirements (e.g. number of workers);
- provide a summary of the employment commitments made, if the Proponent has prepared an economic benefits plan or has made specific cooperation agreements with the communities or the Indigenous peoples.
- provide a description of the situations where the project may directly or indirectly create economic difficulties or the displacement of workers, including the mitigation measures intended to address these effects.

16.3. Contracts and Procurement

The impact statement must provide:

- the value construction contracts and construction-related procurement contracts;
- a description of the plans intended to encourage contracting or procurement outlets for Indigenous peoples and analyze the possible capacity of local businesses to present a competitive offer in view of obtaining a contract associated with a project; a summary of the commitments made to businesses, if the Proponent has prepared an economic benefits plan or has made specific cooperation agreements with communities or the Indigenous peoples;
- an estimate of the anticipated levels of local and regional economic participation in the project in relation to the requirements of the entire project (e.g. total monetary value of the contracts);
- a description of the situations where the project may directly or indirectly create economic difficulties or the displacement of businesses, including the mitigation measures intended to address these effects.
- a quantitative assessment of the direct government revenues expected from the project, if the project offers the potential for local, regional, provincial, territorial or federal administrations to collect direct revenue from taxation or other mechanisms during construction or operation.

16.4. Economy

The impact statement must include:

- a study that shows that the facilities contemplated in the application will be used and useful, and that the costs of the application will be paid and that sufficient funds are available to satisfy the closure requirements;
- provide an estimate and a description of the direct, indirect and induced economic impacts of the designated project in the short and long term;
- provide the sources and methods used to develop the multipliers and estimates;
    - when a generic multiplier does not faithfully reflect the specific situation of the assessed project, it must provide proof of the specific economic activity that will result from implementation of the project;
- provide a description of the potential effects of the changes in the economic conditions in the communities concerned, particularly:
    - forestry and forest harvesting activities;
    - fishing, hunting, trapping;
    - commercial outfitters;
    - commercial recreational and tourism activities;
    - agriculture, including the anticipated effects on livestock health and productivity;

- the anticipated effects of the project on the quality and quantity of groundwater or surface water used for commercial purposes;
- an estimate of the impacts on the revenues of local, regional, provincial, territorial or federal administrations, or of Indigenous peoples, coming from taxation, royalties, revenue sharing and other means during construction and operation, including a quantitative assessment of these impacts;
- provide an examination of the project's impact on the federal and provincial gross domestic product;
- provide an assessment of the net economic benefits for the Canadian economy as a whole, which necessitates a detailed annual cash flow forecast for the duration of the project, including a sensitivity analysis showing the impact of the changes of the discount rate, prices, capital and operating costs or other significant parameters;
- provide an estimate of the project's potential effects on the traditional economy, including the loss of traditional economies and jobs;
- provide an analysis of the potential changes in property values;
- provide an analysis of the potential changes in the cost of living resulting from the project.

The impact statement must apply GBA+ to all effects and document how the potential effects of the changes in economic conditions could be different for specific subgroups representative, including the Indigenous peoples and other relevant community subgroups (e.g. women, youth, elders).

17. Effects on Valued Components — Indigenous Peoples

The Proponents are encouraged to cooperate with the Indigenous peoples in order to determine and understand the potential impacts of their projects on the Indigenous peoples, and integrate Indigenous knowledge into the impact statement. Engagement of the Indigenous peoples is required to clarify the impact assessment and determine the courses of action that will allow avoidance or minimization of the project's potential impacts on the Indigenous peoples. This engagement can also allow identification of potential favourable findings, particularly courses of action that could enhance the underlying reference conditions that facilitate the exercise of rights. This engagement must include an exchange of information and continuous cooperation between the Proponent and the Indigenous peoples to contribute to validate the conclusions of the study. The findings of any consultation, with each Indigenous people, must be presented in the impact statement and translate the point of view of the Indigenous peoples concerned. In the event that an Indigenous people has produced a specific study, the Proponent is encouraged to append it.

The Proponent is encouraged to give the Indigenous peoples the opportunity to examine the information before the presentation of the impact statement. The impact statement should include the indications regarding the locations where the comments of the Indigenous peoples, particularly

Indigenous knowledge, have been integrated. Whenever possible, the information should be presented separately for each Indigenous people that participates in the assessment and include contextual information on the members composing the Indigenous peoples (e.g. women, men, elders and youth).

When Indigenous peoples do not wish to participate, the Proponent is encouraged to continue to communicate information and analyses to the Indigenous peoples regarding the potential effects of the project and use the available public information sources to support the assessment and to document its efforts in this sense.

17.1. Effects on Indigenous Peoples

The impact statement must provide information on how the project may affect the Indigenous peoples, depending on the information provided by the Indigenous people or peoples that participate in it. The information pertaining to the courses of action that are proposed to consider the adverse effects must also be provided, particularly the points of view of the Indigenous peoples on the potential mitigation measures. The Proponent is encouraged to apply the Agency's guidelines on engagement of Indigenous peoples and the appropriate method for assessing the effects and the impacts on the Indigenous peoples and their rights or interests.

The potential effects that must be considered in the assessment include both the adverse effects and the positive effects on the current use of land and resources for traditional purposes, the natural and cultural heritage, and the environmental, health, social and economic conditions of the Indigenous peoples who are affected by the designated project, particularly the ways the project affects the following factors:

- the quality and quantity of resources available fore the harvest (e.g. terrestrial and aquatic species of cultural significance, traditional and medicinal plants);
- access to harvesting areas or significant cultural resources;
- experiences in the territory (e.g. the changes in the quality of life, noise exposure, the effects of vibrations due to blasting or other activities, fragmentation of the territory);
- the current and future availability and the quality of harvested foods (traditional foods);
- the use of travel routes, waterways and water bodies;
- commercial and non-commercial fishing, hunting, trapping and gathering activities, as well as cultural and ceremonial activities and practices;
- commercial and non-commercial economies and economies based on trade;
- the cultural heritage and the structures, sites or factors of historical, archaeological, paleontological or architectural significance for the groups, including:
    - loss or destruction of the natural heritage and the cultural heritage;
    - change in access to the natural heritage and the cultural heritage;

- changes in the cultural value, spirituality or significance attached to the natural heritage and the cultural heritage;
- changes in the sacred, ceremonial or culturally significant places, objects or things, including languages, histories and traditions;
- changes in the visual aesthetics during the project lifecycle and after closure or decommissioning of the project.

As best practices, the Proponents are encouraged to also include the following factors:

- a description of the plans intended to encourage the possibilities of employment (including training opportunities), procurement and markets for Indigenous peoples, including underrepresented groups;
- a description of the plans intended to encourage recruitment, retraining and maintenance in place of underrepresented groups in the project, and analyze the potential for increasing employment for women and other subgroups and local workers more generally;
- describe any training or education program or any bursary the Proponent applies to improve the employment possibilities for local residents, including for the underrepresented groups;
- if applicable, describe the workforce retraining plans associated with the project in terms of diversity and inclusion;
- an estimate of the anticipated levels of participation of the Indigenous peoples in the project in relation to the project's total requirements (e.g. number of workers);
- a description of all the cultural awareness training plans for non-Indigenous employees in order to promote a safe workplace that facilitates the welfare of Indigenous employees;
- a description of all the cultural competency training plans for non-Indigenous employees in order to maintain a respectful professional relationship with Indigenous contractors;
- a description of how Indigenous knowledge has been used to assess the environment, health, social and economic effects on the Indigenous peoples.

17.2. Impacts on the Rights or Interests of Indigenous Peoples

The impact statement must describe the level of engagement of the Indigenous peoples regarding the project's potential impacts on the exercise of rights and, whenever possible, the way the project may affect the exercise of rights. In cases where an Indigenous people has not provided this information to the Proponent or if the two parties agree that it is preferable to provide the information regarding the impacts on the exercise of rights directly to the Government of Canada, the Proponent must describe the reasons that justify the approach adopted. The Proponents are encouraged to discuss with the Indigenous peoples to learn their point of view on the best way to consider the assessment of the impacts on rights and interests in their impact statement, which may

include support for the conducting of other studies directed by Indigenous peoples, which must be provided to the public and the Government of Canada.

For more information on the determination and assessment of impacts on the exercise of rights, see the document *Assessment of Potential Impacts on the Rights of Indigenous Peoples*. which is available on the Agency's website.

The Proponent and the Indigenous peoples may consider the following:

- the way the project can contribute cumulatively to any existing impact on the exercise of rights, based on the determination made by the Indigenous people or peoples;
- the way the project influences the quality and quantity of resources available for the exercise of rights;
- the way the project affects access to significant areas for the exercise of rights;
- the way the project affects access the experience related to the exercise of rights;
- the way the project affects Indigenous traditions, legislation and governance;
- the severity of the impacts on the exercise of Indigenous rights, based on the determination made by the Indigenous people or peoples;

The Proponents are encouraged to work with the Indigenous peoples to find mutually acceptable solutions to the concerns raised regarding a proposed project, particularly the concerns raised regarding the impacts on the exercise of their rights. The impact statement must specify:

- the project's potential effects on the exercise or practice of the rights of Indigenous peoples or the rights arising from treaties in the project area;
- any course of action determined to attempt to eliminate, minimize, offset or consider in another way the potential adverse effects of the project on the exercise or practice of the rights of Indigenous peoples;
- describe if and how these courses of action will be integrated into the project's design;
- concerning the mitigation measures proposed by the Proponent, the impact statement must include the points of view of the Indigenous peoples potentially affected regarding the effectiveness of the specific mitigation measures regarding such impacts.

When no mitigation measure is proposed or no mitigation is possible, the impact statement must determine the possible degree of severity of the adverse impacts on the rights of Indigenous peoples, based on the determination made by the Indigenous people or peoples.

The mitigation measures are described in more detail in Section 18.

17.3. Natural and Cultural Heritage

The impact statement must:

- assess the potential effects of the changes on the structures, sites or objects of historical, archaeological, paleontological or architectural importance and the effects associated with other social and economic conditions;
- provide copies the correspondence of the provincial or territorial authorities responsible for the heritage resources, containing their comments regarding the assessment of the heritage resources and the proposed mitigation measures;
- describe the outcomes of the engagement activities conducted with Indigenous peoples who have concerns regarding the heritage resources of the project area and indicate the participation of the members of these communities in the related studies, if applicable;
- present the contingency plans and the field interventions that would be applied if heritage resources were discovered during construction.

17.4. Current Traditional Use of Indigenous Lands and Resources

The impact statement must:

- describe all the reasonable alternative solutions considered that would not have an impact on traditional use of Indigenous lands and resources taken into consideration during the preparation of the project;
- describe all the feasible courses of action that would be taken to mitigate the impact of the activity on traditional use of Indigenous lands and resources;
- describe the method used to collect information on traditional use of Indigenous lands and resources and the list of Indigenous peoples likely to be affected by the project, as well as the justification of the contacted communities appearing on the list;
- show that the Indigenous peoples who participate in information gathering on traditional uses had the possibility of reviewing this information and the proposed mitigation measures. Include the comments of the Indigenous participants on the information collected and the proposed mitigation measures.

17.5. Health, Social and Economic Conditions of Indigenous Peoples

The requirements established in the previous sections relating to the effects on health, social and economic conditions consider Indigenous peoples and GBA+ specific to Indigenous peoples.

18. Mitigation and Improvement Measures

The proposed mitigation and improvement measures are the subject of discussions during the examination of the impact statement and can be modified after the examination. It is possible for the mitigation and improvement measures to be included as conditions in the decision statement. If a regional assessment is in progress or completed in the project area, the Proponent should use the information generated by this process to clarify the possible mitigation or improvement measures.

It is recommended that the Proponent first prefer an approach intended to eliminate and reduce the adverse effects at the source. For example, consideration of sensitive periods for fish, shore stabilization with vegetation to limit erosion, deployment of measures to eliminate the discharge of harmful substances for fish or migratory birds into the waters or areas where they live (e.g. drilling mud during crossing of watercourses and wetlands), installation of protective devices against fish entrainment and mortality during pumping activities (e.g. cofferdams) or water drawing (e.g. hydrostatic tests) are mitigation measures that can allow reduction or elimination of the effects on fish and fish habitat. Thus, an effect initially deemed significant can be mitigated or eliminated by applying different measures. The Proponent is also encouraged to work with the community and the Indigenous peoples to harmonize the project's objectives with the goal of increasing the positive effects of the project. For example, this may involve modifying the design or moving certain components of the project.

18.1. General

The impact statement , must:

- describe the standard measures, policies and commitments regarding mitigation that constitute technical and economically feasible proven mitigation measures and that will be applied in common practice, regardless of the location, as well as any new or innovative mitigation measure proposed;
- specify the interventions, the work, the ecological footprint reduction techniques, the existing best technology, the best environmental practices, the corrective actions and any addition anticipated in the various stages of the project with a view to eliminating or mitigating the adverse effects of the project (e.g. minimize the width of the right of way, opt for crossing by directed drilling when possible, minimize the duration of the work in water, etc.);
- describe the mitigation measures specific to each environmental, health, social or environmental effect. The mitigation measures will have to be written as special commitments clearly describing how the Proponent intends to implement them and the outcome sought by these mitigation measures. The grounds that make it possible to judge

that the proposed measures reduce or eliminate the anticipated adverse effects must be presented;

- describe the environmental protection plan of the designated project and the environment management system that the Proponent will use to implement this plan. The plan must provide a general perspective of how the potentially adverse effects would be mitigated and managed over time;
- define the mechanisms that will guarantee that the contractors and subcontractors will comply with the Proponent's commitments and policies and its audit and law enforcement programs;
- where applicable, determine if other technical and economically feasible mitigation measures have been considered but have not been retained. Explain why they were rejected and justify any compromise between the cost savings and efficiency associated with the various forms of mitigation measures;
- where applicable, assess the potentially adverse environmental effects associated with the mitigation method itself;
- in addition to the mitigation measures pertaining to the effects of the gas pipeline, include a mitigation and decommissioning plan for the access roads and the other temporary components of the project;
- include measures to counter the sensory disturbances and the resulting functional habitat loss;
- include measures to prevent the gas pipeline for serving as a channel for propagation of invasive species, such as the European common reed (*phragmites australis*);
- determine measures to prevent and mitigate the risk of engaging in harmful, destructive or disruptive activities, in significantly sensitive periods and locations (e.g. spawning, migration and nesting) for fish or migratory birds, their nests and their eggs, in the waters where fish live and the areas frequented by migratory birds;
- determine the measures to eliminate discharge of harmful substances for fish and migratory birds into the waters or areas where they live;
- provide an assessment of the possible effectiveness of the feasible mitigation measures and describe all the relevant uncertainties regarding the effectiveness of the measures. There must be explicit reasons to determine whether the mitigating measure reduces the extent to which the effects are adverse;
- determine and describe the use and application of the best available technology and the best environmental policies, including their effectiveness regarding contaminants of concern, in order to prevent adverse effects on the receptor environment, to determine, assess and implement mitigation measures;
- identify other technically and economically feasible mitigation measures that were considered but not proposed for implementation and explain why they were rejected.

Provide the rationale for any trade-offs between the cost savings and effectiveness associated with the various forms of mitigation measures;

- identify the party responsible for implementation of the mitigation measures and the accountability mechanism;
- describe how the results of the results of GBA+ regarding the disproportionate effects were used to clarify mitigation and improvement measures, including measures with a view to preventing sexual harassment and gender-based violence;
- describe the contingency plans that will be necessary to ensure mitigation of unexpected problems during construction, such as the discovery of heritage sites and resources, and lands and sites for use of traditional resources that were previously unknown;
- draw up a list and produce a summary of the observations relating to the mitigation measures along the pipeline route in a commitment follow-up- table, in a form that allows all participants to identify and understand the timing and place of implementation of the observations on the application measures; this table should be updated regularly during the assessment process so that it remains current.

When it is proposed to implement mitigation measures for which little expertise exists, or for which the issue of effectiveness raises questions, in case these measures are not effective, the risks and potential effects on the environment must be described clearly and concisely. Moreover, the impact statement must determine the extent to which the technological innovations can contribute to mitigate the effects. Whenever possible, detailed information on the nature of these measures, their implementation, and the management and requirements of the monitoring program will be included.

Without reducing the generality of the factors presented, the following subsections present requirements specific to the individual valued components.

18.2. Atmospheric, Acoustic and Visual Environment

The impact statement must:

- describe the mitigation measures for the potential effects on the atmospheric acoustic and visual environment, including the following details, if they are relevant;
- provide a description of all the methods and practices (e.g. control equipment, heat or gas recovery system) to be deployed to reduce and control emissions.
- provide a noise management plan, including identification of the noise sources, an assessment of the common noise mitigation measures, the performance efficiency of the noise control devices, the best practices programs and the continuous improvement programs, and establish the need for follow-up monitoring for the purposes of validation of

the model or due to any concern raised by the public. The noise management plans must consider the following factors: notification and planning of maintenance operations, such as express purge and ventilation of equipment during clarity hours; notification to the nearby residences and the local authorities regarding the noise prevention and management plans and procedures;

- develop and implement strategies compliant with the commitment of the Canadian Council of Ministers of the Environment (CCME) regarding prevention of pollution;
- ensure that the best available economically feasible technologies to reduce airborne particulate matter concentrations and other contaminants are implemented. If the best available technologies are not included in the design of the project, the Proponent must provide a justification of the technologies selected;
- implement measures to reduce emissions and formation of dust and particulate matter from land development and construction operations, including those coming from machinery and vehicles. The mitigation measures should include design factors specific to the site, operating practices, precise technologies, and the products and equipment that will be used to prevent or control emissions;
- apply various methods to reduce dust emissions, such as imposing speed limits, using dust removals, using wet spraying on material piles, building gravel roads using a material with low silt content, where applicable, and deploying a particulate matter monitoring program outside the boundaries of the project site;
- adopt the best management practices, such as those presented in the document “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities” [in English only] prepared for Environment Canada by Cheminfo Services (March 2005);
- produce and apply a precise and rigorous management plan for dust emissions from non-asphalted roads for duration of the project, e.g. construction, operating, closure and remediation phases. The plan must describe the emission sources and the related control methods and mitigation measures to be applied;
- reduce road and off-road vehicle engine emissions by adopting technological strategies (e.g. use of exhaust gas post-treatment devices, use of replacement fuels) and operational strategies (e.g. establish limits for idling);
- for operation of the turbines in the compression stations, consider the CCME’s National Emission Guidelines for Stationary Combustion Turbines, the Environmental Code of Practice for the Measurement and Control of VOC Emissions from Equipment Leaks including the details of the leak detection and repair program deployed if fugitive VOC (volatile organic compound) emissions constitute a concern for the project for above-ground storage tanks, as well as the CCME’s Environmental Guidelines for the Reduction of Volatile Organic Compounds. The CCME’s national guidelines establish voluntary targets that have been developed in collaboration with the provincial, territorial and federal authorities to induce

proponents of projects to operate combustion turbine facilities in instances so that they limit atmospheric emissions.

18.3 Groundwater and Surface Water

The impact statement must:

- describe the mitigation measures for the potential effects on groundwater and surface water, including the following details, if they are relevant;
- describe the mitigation measures for the possible effects on the quantity and quality of surface water, groundwater and well water, including the necessity of specific monitoring before and after construction.
- describe any applicable water management plan;
- describe and justify water use (e.g. hydrostatic tests) and the measures that will be taken to eliminate or reduce the adverse effects, including the supply and discharge of water, and eventual exchanges between watersheds that would lead to the introduction of an undesirable biota. If the final details of the hydrostatic tests have not been confirmed yet, the applicant nonetheless must specify the expected requirements, the options available and the criteria it intends to apply to assure protection of water resources. The applicant may also indicate other water sources (i.e. recycled water or brine) for the project and consider the possibility of reusing the water from the tests to run checks in the different pipeline sections;
- describe the groundwater and surface water monitoring programs during the operating and post-construction periods.

18.4 Riparian and Terrestrial Environments and Wetlands

The impact statement must:

- describe the mitigation measures for the potential effects on the atmospheric acoustic and visual environment, including the following details, if they are relevant;
- relating to soil:
    - describe and justify the soil treatment methods to eliminate or reduce the adverse effects on the soils and materials in the root area, including the recovery techniques (e.g. soil stripping, including the proposed width, stump removal and other soil treatment techniques); soil separation maintenance measures, when drainage basin soil separation is undertaken, control measures for wind and water erosion, work shutdown procedures in case of wet conditions, and soil settlement prevention measures;

- describe and justify how to locate preexisting soil or sediment contamination, the mitigation and monitoring measures that will be undertaken in this regard, and the applicable regulatory restoration measures;
- describe and justify the biosafety measures that will be employed to identify the biological risks and eliminate their propagation, such as diseases in the soil or the roots.

- describe and justify the construction methods used to cross wetlands and other sensitive terrestrial habitats, and the criteria for determination of techniques proposed for each crossing, including the locations where crossing methods without trenches will be employed;
- describe and justify the ways of avoiding or reducing the temporary or permanent adverse effects on wetlands and riparian habitats;
- describe the vegetation standards and controls that will be deployed during construction and operation of the project;
- relating weeds and invasive species:
  - describe and justify the measures allowing identification of weeds and invasive species; avoid their propagation and control them during all phases of the project (e.g. before, during and after construction), including the necessity of preconstruction surveys to identify the areas with a high density of weeds;
  - describe integrated vegetation management programs, including:
    - the criteria and circumstances of application of chemical, biological or mechanical control methods;
    - the methods to be used to prevent the proliferation of invasive non-indigenous species; and the selection of plant species to be conserved and planted in order to promote vegetation communities with low natural growth (e.g. for linear projects).
  - If it is possible that herbicides or other chemicals are used, consider their criteria of use; concentrations, quantities and methods of application; their specificity and possible adverse environmental effects, and consult the material safety data sheets.
- Concerning wetlands :
  - show the efforts made to eliminate and minimize the impacts on wetlands and that the hierarchy of mitigation measures was followed;
  - explain why other locations and alternatives to the project, or alternative means of carrying out of the project were not possible, and indicate how the impacts on wetlands will be minimized;

- explain how avoidance was considered as the first option and how avoidance can be achieved by identifying alternatives to the project (such as the location or the design of the project) and considering alternatives means of carrying out the project;
- explain how mitigation can be obtained by modification or implementation of the project under special conditions after considering other means than the project. Describe how the following factors were taken into account:
    - Standard procedures and techniques, if they are available for the sector or the jurisdiction.
    - Procedures and techniques based on solid ecological principles and the best available scientific knowledge.
    - Proven measures on new or experimental techniques.
    - Mitigation techniques that consider the natural succession and that should consider the variability of the environment over time.
    - Compensation for any residual effect that could be minimized, in the following order: restoration, remediation of existing wetlands or creation of new wetlands;
    - Demonstrate that the functions of the wetlands can be replaced with the proposed compensation activities.
- Indicate if it is not possible to compensate for the loss of functions in the case that the wetlands are unique, that they fulfil habitat functions ensuring the survival of a large proportion of migratory birds or that they provide the necessary habitat for species at risk, and take this information into consideration during development of the compensation.
- Use a minimum ratio of 2:1 of the area of the restored or created wetlands relative to the original area of the wetlands affected. A higher compensation ratio is recommended for the types of wetlands for which the compensation presents the greatest level of difficulty or when there are uncertainties concerning the success of the compensation.
- Clearly indicate the quantity of wetlands (location, extent) for which the residual effects should be mitigated by compensation measures.
- Prioritize restoration of the drained or altered natural wetlands of the same type and function as those impacted. Wetland restoration is preferable to wetland improvement, and both are preferable to creation of new wetlands.
- Compensate for the functions of the lost wetlands on the site, if the site conditions are suitable for the wetland functions to be offset. The second preference is within the same watershed as the one where the wetlands were lost. The third preference is situated in the same ecosystem as the one in which the wetlands were lost.
- Incorporate compensation measures to minimize the delay in availability of the habitat and the functions between the time when the adverse effects occur and the time they have been completely offset;

- all the peat extracted should be stockpiled to be used for site reclamation;

- describe the revegetation procedures to be implemented in the course of the project, particularly:
  - the revegetation techniques and the locations where they would be implemented;
  - the seed mixes to use, the spreading rates and the location of the spreading. Native and indigenous species adapted to the local conditions should be used when the purpose of revegetation is to naturalize or regenerate the area; the fertilizers that will be used, the spreading rates and the locations, the criteria for determining these technical features;
  - the emergency seeding and planting plans, which include a description of the species to be replanted, the replanting locations and the criteria for determining these specifications;

- relating to the right of way:
  - describe and justify the width of the construction right of way and the permanent right of way, including the locations where the right of way will be narrowed to eliminate or reduce the adverse effects;
  - describe and justify the necessary of any additional temporary construction site, and how to locate and manage it to minimize the adverse effects;

- also consult the compensation plans below.

18.5 Fish and Fish Habitat

The impact statement must:

- describe the mitigation measures for the potential effects on fish and fish habitat, including the following details, if they are relevant;
- describe the measures recommended for crossing of temporary or permanent watercourses (access and maintenance roads), including the locations where methods of crossing watercourses without a trench will be used, particularly to ensure the free circulation of fish when necessary. As applicable, non-maintenance of free passage for fish will have to be documented and justified (e.g. by showing that a barrier exists to free passage at the location of the crossing structure or near it upstream or downstream; that the quantity and quality of habitats upstream from the structure is marginal);
- describe the measures recommended in the aquatic and riparian environment for each gas pipeline crossing method (retained or potential) with or without a trench (e.g. restriction

period for fish, control of erosion and sedimentation, measure to avoid introduction of harmful substances into the waters where fish live (e.g. drilling mud), etc.);

- describe the measures for prevention and mitigation of the risk of harmful, destructive or disruptive activities during the sensitive periods and in the sensitive locations (e.g. spawning, migration and nesting) for fish in water or places frequented by fish;
- describe the measures recommended to avoid fish mortality during use of explosives in the aquatic environment or nearby, or by fish entrainment during pumping and water drawing operations (e.g. temporary structures and hydrostatic tests);
- determine the measures allowing elimination of the deposit of substances harmful to fish in the water or in the zones frequented by fish;
- describe the timing of the work in the water, including the periods and windows of limited activity;
- describe the conditions on which the crossings of watercourses and riparian areas would be restored and maintained after construction of the project;
- describe the criteria for assessment of the successful restoration of the water bodies sheltering fish and their shores, as well as the riparian areas; describe the mode and timing and the conditions of documentation of this assessment;
- describe the measures recommended to govern the conducting of hydrostatic tests, including water drawing and discharge operations;
- describe the measures recommended to eliminate the introduction of invasive aquatic species during work in the aquatic environment;
- describe the measures recommended for restoration of locations in the riparian and aquatic environments;
- describe the standard measures, policies and commitments regarding mitigation that constitute technical and economically feasible proven mitigation measures and that will be applied in common practice, regardless of the location, as well as any new or innovative mitigation measure proposed;
- also consult the compensation plans below.

18.6 Birds, migratory birds and their habitat

The impact statement must:

- describe the measures for mitigating potential effects on birds, migratory birds and their habitat, including the following details if relevant;
- specify the measures to prevent and mitigate the risk of harmful, destructive or disruptive activities during sensitive periods and in sensitive locations (e.g. breeding, migration and

nesting) for migratory birds, their nests and their eggs, and areas frequented by migratory birds;

- describe the measures for preventing the deposit of substances harmful to migratory birds in areas frequented by migratory birds;
- to avoid harm to migratory birds, vegetation removal and construction should be carried out outside the main breeding season. Follow ECCC guidelines to avoid adverse effects (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html);
- for general nesting periods, see: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html;
    - It should be noted that these dates cover the main nesting period of migratory birds, which reduces the risk of taking their nests or eggs. This recommendation does not authorize the disruption, destruction or taking of a migratory bird, its nest or its eggs outside these periods.
    - The query tool https://www.birdscanada.org/volunteer/pnw/rnest/index.jsp. can be used to create customized nesting calendars for particular species and places of interest. The nesting calendars are created based on the main portion of the nesting season and can be sorted by different categories, such as species, ecodistricts, bird conservation regions, ecoregions, nesting areas, provinces and territories, federal protection, habitats, nest type and species type. For example, calendars subdivided by ecodistrict indicate the percentage of selected bird species that are likely to nest based on the ecodistrict selected. The tool contains a warning, which provides important information about the definition of the nesting periods, the accuracy of nesting dates and the protection of bird nests and eggs. This warning should be read before using the tool.
- specifically address mitigating impacts to eskers, as this type of geological formation has an uncommon land cover type that is of high value to forest birds during migration and breeding. Indicate whether eskers will be affected and whether they will be affected to a much higher degree in relation to their prevalence in the landscape. Describe, at a landscape scale rather than a single assessment of multiple hectares, how these measures address this land cover. Describe the cumulative effects on this type of landscape;
- see also compensation plans below.

18.7 Terrestrial wildlife and their habitat

The impact statement must:

- describe the measures for mitigating potential effects on terrestrial wildlife and their habitat, including the following details if relevant;

- describe and explain the condition in which the temporary construction areas and the permanent right-of-way will be restored or maintained following construction, including consideration of possible revegetation, obstruction of the sightline, restoration of wildlife corridors and habitat connectivity, reduction of fragmentation and reduction of general long-term cumulative effects;
- describe and explain the measures to control the use of the right-of-way by third parties, such as hunters or wildlife predators, to gain access to areas that were previously difficult to reach;
- provide the best technically and economically feasible approaches for mitigating habitat impacts, according to the following hierarchy:
    - avoid potential impact;
    - mitigate potential impact;
    - provide biodiversity conservation offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized;
    - provide justification for moving from one mitigation alternative to the next.

18.8 Species at risk

The impact statement must:

- describe the measures for mitigating potential effects on species and ecological communities at risk, including the following details if relevant;
- provide the best technically and economically feasible approaches for mitigating habitat impacts, according to the following hierarchy:
    - avoid potential impact;
    - mitigate potential impact;
    - provide biodiversity conservation offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized;
    - provide justification for moving from one mitigation alternative to the next;
- identify and describe mitigation measures, including alternative means of carrying out the project, that would avoid or reduce potential adverse effects on terrestrial and aquatic species or critical habitats identified in Schedule 1 of the *Species at Risk Act*. These measures:
    - must be consistent with any applicable recovery strategy and action or management plan and will identify and describe mitigation measures to avoid or minimize adverse effects on species assessed by COSEWIC;
    - must be described in terms of the effectiveness of each measure in avoiding adverse effects and include a full rationale, based on scientific data, for proposing the selected mitigation measures;

- In relation to bats:
    - Follow the decontamination protocols for white-nose syndrome (Canadian Wildlife Health Cooperative: http://www.cwhc-rcsf.ca/docs/WNS_Decontamination_Protocol-Nov2016.pdf).
    - Apply appropriate mitigation measures, such as restriction periods and buffer zones, to all areas that may contain a resting habitat, unless each structure has been specifically verified and confirmed not to be used for resting.
        - Use a buffer zone of 120 m.
        - Specific periods: Clearing of trees considered to be bat habitats should be done only outside the period from April 30 to September 1 (https://pdfs.semanticscholar.org/05d5/83868810a27e8587606d7aa5351c46b94dd4.pdf).
    - Describe the effectiveness of the mitigation measures, taking into account the configuration of the resources in the environment and how local bat populations use those resources. Describe how bat behaviour (differentiated by species) has been taken into account, based on the geographical location and time period.
    - At minimum, the following mitigation measures should be implemented:
    - Spatial avoidance:
    - A buffer zone of 120 m is recommended; for resting areas and nurseries in trees, apply a buffer zone to the entire complex of roosts and nurseries, and for hibernacula, apply the buffer zone to the entire underground cave and mine system.
    - Temporal avoidance (timing of disruption, destruction of resting areas or exclusion):
    - Avoid disruption, destruction and exclusion between April 30 and September 1.
    - Lighting:
        - Avoid or minimize the use of artificial light in bat habitats.
        - Select low-intensity lighting.
        - Use lighting fixtures that restrict or focus illumination to target areas.
        - Avoid lights that emit blue/green/white/UV wavelengths.
    - Other compensation

- In relation to caribou:
    - Demonstrate that avoidance and minimization measures will be applied for boreal caribou and its critical habitat.
    - Describe all reasonable alternative means of carrying out the project that would avoid the adverse effects of the project on boreal caribou, how these alternative means have been considered, and provide a rationale to confirm that the best solution has been adopted to address adverse effects on boreal caribou.
    - Describe all feasible measures that will be taken to minimize the adverse effects of the project on boreal caribou and its critical habitat.

- Minimize the footprint of the development and consider locations where the habitat is already disturbed; restore the habitat to provide availability of undisturbed habitat over time.
- Avoid destruction of biophysical attributes (see Appendix H of the recovery strategy) (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html).
- Minimize noise, light, smell and vibrations.
- Develop a management plan.
- Use techniques to prevent predators from using the corridor.

- In relation to turtles:
  - In particular, adhere to the provincial guidance document: Summary of protection and mitigation measures for turtles in Quebec concerning roads, gravel pits, quarries and agricultural and forest environments – For MFFP regional analysts and wildlife specialists. Quebec Turtle Recovery Team. 16 pages.
- see also compensation plans below.

18.9 Compensation plans

The impact statement must:

- provide compensation plans to address all residual effects to species at risk and their critical habitat, migratory birds, fish and fish habitat and/or wetland functions (if applicable) for review during the environmental assessment process; The plans should:
  - describe the baseline conditions of the species at risk, critical habitat, migratory birds and wetland functions potentially impacted by the designated project;
  - apply the mitigation hierarchy;
  - identify and describe residual effects;
  - identify a compensation ratio with rationale, including how any policies or guidance provided by federal and provincial authorities and Indigenous groups have been considered;
  - identify the location and timing of implementation of compensation projects (where feasible);
  - identify and describe the success criteria;
  - identify and detail non-habitat measures;
  - describe how the proposed measures align with published provincial and federal recovery, management or action plans and strategies for species at risk;
  - identify the parties responsible for implementation, including monitoring and review;

- identify indicator species for setting compensation objectives. Identification should be based on baseline data, bird conservation strategies, and other information where available (note: species at risk should not be used as indicator species; compensation efforts need to be directed specifically to these species);
- describe the functions gained at the compensation sites;
- provide evidence that functions can be replaced by the proposed offset activities;
- describe the process of selecting proposed compensation sites and associated baseline conditions;
- provide a description of the monitoring schedule and activities to be completed to monitor the success of compensation activities.
- If offsets are required to address residual impacts, the following guidance should be used: https://www.canada.ca/en/environment-climate-change/services/sustainable-development/publications/operational-framework-use-conservation-allowances.html.

- For species at risk
  - See Template 2 in the Species at Risk Act Permitting Policy (proposed version) for preparing an offsetting plan (https://wildlife-species.canada.ca/species-risk-registry/document/default_e.cfm?documentID=2983).

Residual effects resulting from the project may need to be offset by implementing compensatory measures. Where applicable, the impact statement must include compensation plans for consideration during the impact assessment process.

In particular, compensation plans may be required in relation to residual effects affecting both aquatic and terrestrial species at risk and their habitat, fish and fish habitat, migratory birds and wetlands. Compensatory measures may also be required in relation to residual effects associated with non-environmental, social or economic VCs as well as those suggested by Indigenous groups.

For fish and fish habitat, where applicable, the proposed compensation program should include, but not be limited to, the following information for each proposed compensation plan:

- an exact location for the proposed measures (latitude and longitude, lot number, municipality, RCM, etc.) of the project and property rights;
- baseline information including a description of the environment (biological, hydrological, physical, chemical, etc.), an estimation of the quality of the environment in question and a description of the problem to be corrected. Ideally, the description of the environment should be accompanied by georeferenced and dated photographs;
- a description of the proposed measures (nature, extent, method, timetable, etc.);

- the fish species affected by the proposed measures, including the resulting fish habitat functions (feeding, reproduction, rearing, shelter, growth, migration);

- an assessment of how proposed measures align with published provincial and federal recovery, management or action plans and strategies for species at risk;

- an assessment of the benefits to fish and fish habitat resulting from the compensation measures in terms of the significance, magnitude and adequacy of the gains to be achieved with respect to the current situation;

A follow-up program to measure achievement against compensatory objectives and implementation details, including how success will be measured. Compensatory objectives as well as the methods and criteria used to evaluate success (parameters, frequency, duration, etc.) must be clearly identified and described. Deliverables must be identified (baseline information, follow-up protocol, plans and specifications, work report, follow-up report, etc.) along with contingency measures in case success criteria are not met. It is recommended that the compensatory objectives and schedule for the follow-up program (including deliverables) be compiled in one or more tables.

18.10 Climate change and GHG emissions

The impact statement must:

- describe the measures and practices included in the design to minimize the project's GHG emissions, such as the use of low-emission technologies, low-carbon or renewable fuels, electrification or carbon capture and storage, anti-idling measures for mobile equipment, leak detection and repair systems, spare power for compressor stations, methods to reduce the need for blowdown, venting and flaring during operations, continuous monitoring systems or fleet optimization;

- describe the practices that will be followed to mitigate the project's GHG emissions, such as anti-idling measures for mobile equipment, leak detection and repair systems, continuous monitoring systems or fleet optimization and describe information about the offset credits that have been or will be issued, including the offset credit system, project type, project start date and baseline year;
- The proponent may also provide information on its intention to acquire or generate foreign offset credits.
- To support potential mitigation measures, provide a comparison of the project's projected GHG emissions intensity with the emissions intensity of similar projects in Canada and internationally that are good examples of energy-efficient or low-emissions projects. The comparison should explain why the emissions intensity may be different.
- In the event that the net GHG emissions from the project exceed 500 kt of CO_2e per year, a process to identify the best available technologies and best environmental practices that are technically and economically feasible to reduce GHG emissions must be carried out according to the SACC.

See also the CER's Interim Filing Guidance (dated August 22, 2019) for further guidance on GHG emissions and climate change.

18.11 Human health

The impact statement must:

- describe the mitigation and enhancement measures that will be implemented for any potential effects on human health;
- if the level of emissions from a particular project or effluent discharge is below or at the applicable limits, additional mitigation measures may not be required. However, if the change may be substantial (even within established limits) as a result of local or regional circumstances or the extent of the change, the applicant must provide additional mitigation measures to minimize pollution and risks to human health;
- when potential effects on human health exist due to exposure to a non-threshold contaminant (e.g. certain air pollutants such as fine particulate matter and nitrogen dioxide as well as arsenic and lead in drinking water), mitigation measures should aim at reducing residual effects to as low a level as reasonably possible;
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on vulnerable populations, and they are not disadvantaged in sharing any benefits and opportunities resulting from the project. These mitigation measures should be developed in collaboration with vulnerable or disadvantaged populations; and
- describe how disproportionate effects that were identified in the *GBA+ results were used to inform mitigation and enhancement measures.

18.12 Social components

The impact statement must:

- describe the mitigation and enhancement measures that will be implemented for all potential effects on social valued components;
- identify opportunities to enhance positive impacts, such as improving infrastructure and compatibility with local and regional land use and development plans;
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on vulnerable populations, and they are not disadvantaged in sharing any development benefits and opportunities resulting from the project. These mitigation measures should be developed in collaboration with vulnerable or disadvantaged populations; and
- describe how the GBA+ results on disproportionate effects have been used to inform mitigation and enhancement measures.

18.13 Economic components

The impact statement must:

- describe the mitigation and enhancement measures that will be implemented for all potential effects on economic valued components;
- If the applicant has prepared an economic benefits plan or has entered into specific cooperation agreements with Indigenous communities and peoples, a summary of the employment, training and trade commitments made should be provided;
- where appropriate, provide details regarding financial liability and compensation in place as required by regulation or company commitment in relation to decommissioning or abandonment;
- identify opportunities for enhancing positive effects, such as creation of local employment and employing Indigenous staff;
- describe supplier network development initiatives, including identification of potential local suppliers, and provide them with information about technical, commercial and other requirements, and debrief unsuccessful bidders;
- describe any procurement policies (e.g. bid packaging) that facilitate the opportunities for local companies;
- describe education, training and hiring practices that encourage employment of local people;
- describe technology transfer and research and development programs that will facilitate the use of local suppliers of goods and services and local employees, and that will develop new capabilities related to project requirements;
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on vulnerable populations, and they are not disadvantaged in sharing any development benefits and opportunities resulting from the project. These mitigation measures should be developed in collaboration with vulnerable or disadvantaged populations; and
- describe how the GBA+ results on disproportionate effects have been used to inform mitigation and enhancement measures.

18.14 Indigenous peoples

The impact statement must:

- describe the measures that will be implemented by the applicant to avoid, reduce or eliminate potential adverse effects of the project on the exercise of Indigenous and treaty rights, including:

    - how the measures directly address the possible impacts of the project on the exercise of rights;
    - the scope of the measures that will make it possible to avoid, reduce or eliminate potential adverse effects of the project on the exercise of Indigenous rights;
    - the possible residual effects of the project on the exercise of rights following implementation of the measures;
- describe the measures that would enhance or support the exercise or practice of Indigenous rights in the project area, including:
    - the section of the application where such measures are described (e.g. employment, procurement and monitoring measures), with references or coding;
    - where such measures are proposed, the applicant should describe how these measures have been discussed with affected Indigenous peoples, including any comments or recommendations made by Indigenous peoples or any agreements reached that specify the benefits or compensation measures in relation to the project;
- provide any suggestions or recommendations for specific mitigation measures raised by potentially affected Indigenous peoples with respect to project measures that would address such impacts, and describe the responses, if any, to views expressed by potentially affected Indigenous peoples;
- provide a heritage resource contingency plan, if there is a possibility of discovering heritage resources during construction or development activities, that includes, at a minimum, the person to be contacted and the conditions that would lead to a shutdown and resumption of work;
- provide a contingency plan for traditional use of aboriginal lands and resources, if there is a possibility of discovering such sites during construction or development activities, that includes, at a minimum, the person to be contacted and the conditions that would lead to a shutdown and resumption of work;
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on vulnerable populations, and they are not disadvantaged in sharing any development benefits and opportunities resulting from the project. these mitigation measures should be developed in collaboration with those who are vulnerable or disadvantaged;
- document specific suggestions raised by each Indigenous group for avoiding, mitigating or otherwise accommodating the project's environmental, health, social and economic effects, including potential effects and impacts on Indigenous peoples and rights of Indigenous peoples and:
    - for those mitigation measures intended to address effects of changes to the environmental, health, social and economic conditions of Indigenous peoples or

impacts on rights of Indigenous peoples, provide a description of the consultation with Indigenous groups regarding the residual effects;

- describe whether and how these measures will be incorporated in the project design; and

- describe how the GBA+ results on disproportionate effects have been used to inform mitigation and enhancement measures.

19. Residual effects

Once the technically and economically feasible mitigation measures have been identified, residual effects, even if considered minimal or negligible, must be described and quantified.

The impact statement must:

- characterize the residual effects using criteria most appropriate for the effect;
- where applicable, consideration should be given to the following criteria for residual effects:
  - magnitude;
  - geographic extent;
  - timing;
  - duration;
  - frequency;
  - reversibility; and,
  - the ecological, health, social and economic context within which potential effects may occur should be taken into account when considering all of the key criteria above, for example :
    - the sensitivity and importance of affected aquatic and terrestrial species, including species at risk;
    - the sensitivity and importance of affected habitats and their functions for wildlife;
    - the existence of environmental standards, guidelines and other sources of information must be considered to assess the impact.

The Agency prepared a Technical guidance document for Determining whether a designated project is likely to cause significant adverse effects under the *Canadian Environmental Assessment Act*, 2012. The best practices described in this document also applies to the characterization of residual effects in the context of the *Impact Assessment Act*[11].

[11] To obtain more information regarding best practices in assessing residual effets, please consult the technical guidance on Determining whether a designated project is likely to cause significant adverse effects under the Canadian Environemental Assessment Act, 2012 at the following link : https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/determining-project-cause-significant-environmental-effects-ceaa2012.html

Other sources to identify best practices may complement the technical guidance from the Agency and be used by the proponent as reference. For example, regarding species at risk and their habitat, the report *NatureServe Conservation Status Assessments: Factors for Evaluating Species and Ecosystem Risk*[12] is a reference to evaluate criteria against applicable thresholds.

The impact statement must :

- identify and explain how relevant sources of information were used to characterize the significance of residual effects.
- justify the choice of criteria used to determine how significant the expected effects are. The information provided must be clear and sufficient to allow the Agency, the review panel, technical and regulatory bodies, Indigenous groups and the public to review the proponent's impact analysis;
- take the views of Indigenous groups and the public into account when establishing the criteria to be used and characterizing impacts;
- where applicable, specify the likelihood of, or potential for, residual effects occurring, and describe the level of scientific uncertainty associated with the data and methods used in this analysis.

20. Cumulative Effects Assessment

The impact statement must provide an evaluation of the cumulative effects of the project in combination with other past, current or future projects or activities.

The impact statement must:

- identify and justify the VCs that will be the focus of the cumulative effects assessment;
- The selected VCs are those most likely to be affected by the project in combination with other past, present or future projects and activities (e.g. fish and their habitat, resident and migratory birds and their habitat, terrestrial wildlife and their habitat, etc.);
- include a rationale for excluding other VCs from the cumulative effects assessment, where applicable;
- identify and justify the spatial and temporal boundaries of the cumulative effects assessment for each selected VC. The boundaries of cumulative effects assessments may differ for each selected VC and should not be limited by administrative boundaries:

[12] The report *NatureServe Conservation Status Assessments : Factors for Evaluating Species and Ecosystem Risk* is available at the following link : https://www.natureserve.org/biodiversity-science/publications/natureserve-conservation-status-assessments-factors-evaluating

- spatial and temporal boundaries for cumulative effects will generally be larger than boundaries for the effects of the project alone, and may extend beyond the jurisdictional boundaries of Canada;
- temporal boundaries must be based on appropriate baseline conditions and should account for all potential effects over the life cycle of the project, including decommissioning or abandonment;

- cumulative effects should be assessed using a hierarchy, and impacts on local and large populations should be assessed;
  - In relation to caribou, assess cumulative effects on caribou for the three project study areas defined in section 6.3, as well as throughout the federal Val d'Or caribou range (QC1);
- identify sources of potential cumulative effects;
  - specify whether other projects or activities that have been or will be carried out, including the project that involves the construction and operation of a natural gas liquefaction facility and export terminal in Saguenay, Quebec, proposed by GNL Quebec Inc., could result in effects on the selected VCs within the defined boundaries and whether those effects could interact with the residual effects of the project.
  - this assessment should take account of the results of any relevant regional studies conducted;
- assess the total cumulative effects for each selected VC.
  - the analysis must include the effects of past and future physical activities in combination with the residual effects of the project.
  - the analysis of the effects of future physical activities may include a comparison of possible future scenarios with and without the project, but must reflect the full range of cumulative effects and not just the project's contribution.
  - the effects of past activities (activities that have been carried out) can also be used to put the current state of the VC into context, but must be included in the total cumulative effects analysis.
- the assessment must also assess cumulative effects on Indigenous rights and cultures;
- describe technically and economically feasible mitigation measures to eliminate or reduce adverse cumulative environmental, health, social and economic effects, including:
  - describe and assess the effectiveness of the measures applied to mitigate cumulative effects;
  - in cases where the mitigation measures for these effects are beyond the proponent's control, the impact statement must identify all parties with the power to act on these measures. In such cases, the impact statement shall summarize the commitments of the other parties in relation to implementing the necessary measures and any related communication plan;

- assess the regional implications of applying project-specific mitigation and enhancement measures, taking into account any reasonably foreseeable development in the area;

- describe and, where appropriate, quantify the level and severity of adverse cumulative effects;
- develop a follow-up program to verify the accuracy of the assessment or resolve uncertainty regarding the effectiveness of mitigation measures for applicable cumulative effects.

The Agency prepared a Technical guidance document for Assessing cumulative environmental effects under the *Canadian Environmental Assessment Act*, 2012. The best practices described in this document also applies to the evaluation of cumulative effects in the context of the *Impact Assessment Act*[13].

21. Other effects to consider

21.1 Effects of potential accidents or malfunctions

The failure of certain works caused by technological malfunctions, human error or exceptional natural events (e.g. flooding, earthquake, forest fire) could cause major effects. The proponent will therefore identify hazards and conduct an analysis of the risk of each accident or malfunction during each project phase, determine their potential effects, and present preliminary emergency measures to respond to incidents and reduce risks, in addition to identifying associated response systems and capabilities.

If incidents are expected, then they should be included as expected effects in the above sections.

The impact statement must:

- describe the role of the proponent in the case of an accident or malfunction associated with the project;
- determine, taking into account the lifespan of different project components as well as complicating factors (weather or external events), possible accidents and malfunctions related to the project, the potential for vandalism or sabotage, including an explanation of how these events were identified, their possible consequences (including environmental, health, social and economic effects), plausible worst-case scenarios and the potential unmitigated effects of these scenarios;
- worst-case scenarios should take account of:
  - migration periods involving high concentrations of migratory birds;
  - nesting periods for migratory birds;
  - spawning periods for fish;
  - the presence of sensitive wildlife or important seasonal habitats;

[13] To obtain more information regarding best practices in assessing cumulative effets, please consult the technical guidance on Assessing cumulative environmental effects under the *Canadian Environmental Assessment Act*, 2012 at the following link : https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-under-canadian-environmental-assessment-act-2012.html

- identify and justify spatial and temporal boundaries for the assessment of effects associated with accidents and malfunctions. The spatial boundaries established for the effects resulting from possible accidents and malfunctions will generally be larger than the boundaries for effects of the project alone, and could extend beyond Canada's jurisdiction;
- describe the magnitude and duration of any accidents or malfunctions associated with the project in the worst-case scenarios and in alternative, more likely but less damaging, scenarios, including a description of the quantity, mechanism, rate, form and characteristics of contaminants, greenhouse gases and other materials likely to be released or discharged into the environment in those scenarios and any potential adverse environmental, health, social or economic effects;
- describe the preventive measures and safeguards (including design choices) that would be in place to avoid accidents and malfunctions, as well as the contingency and emergency response procedures in place if such events occur (e.g. drilling mud leak when crossing water bodies and watercourses);
- assess the risk of an accidental fuel spill, whether minor or major, uncontrolled releases of natural gas, or loss of containment of dangerous goods at permanent or temporary facilities during construction and operation phases, or during maintenance operations where applicable;
- where applicable, provide an analysis of the potential environmental, health, social and economic effects of these releases on aquatic and terrestrial environments and on human health within the spatial boundaries identified for the study area;
- the effects assessment should be supported by environmental sensitivity mapping that identifies site-specific conditions and sensitive receptors adjacent to project activities, including banks, streams and wetlands frequented by fish or migratory birds, and likely access routes to them. Shoreline classification surveys and mapping should be conducted along major waterways where large spills are possible. The characterization criteria established by ECCC in the Field Guide to Oil Spill Response on Marine shorelines (2010) are a useful guide in this regard.
- describe existing emergency preparedness and response mechanisms, including existing coordination plans with organizations involved in emergence situations related to a pipeline;
- describe the expected effectiveness of emergency response measures and systems;
- describe emergency response training and exercise programs;
- identify any critical infrastructure, such as local drinking water treatment plants or facilities that can treat water sources affected by the project, as well as the ability of the drinking water treatment plants or facilities to treat water sources affected by accidental releases from the designated project during all project phases;
- describe the equipment and resources available that can be deployed to deal with spills;
- describe mutual aid arrangements in the event that the incident exceeds company resources and how to access these resources;

- describe how the proponent will integrate its response operations into an incident management system (e.g. Incident Command System, ICS) when deploying a major incident response effort;
- where applicable, provide details of financial liability and compensation in place pursuant to regulations or the company's commitment;
- describe liaison and continuous education plans for surrounding communities, including Indigenous groups, that may be affected by the consequences of a significant incident;
- describe emergency communication plans that would provide emergency instructions to surrounding communities, including Indigenous groups. Procedures should combine immediate urgent actions, such as notifying the public of security concerns, instructions for on-site shelter and evacuation, and longer-term actions, such as a general website and telephone helplines, updates on the status of incidents, injured animal reports, etc.
- describe mitigation measures that can be implemented in anticipation of, or in preparation for, possible accidents or malfunctions;
- describe long-term monitoring and recovery measures to clean up affected lands and waters;
- describe possible mitigation measures to address adverse environmental, health, social and economic effects resulting from accidents or malfunctions.

21.2 Effects of the environment on the project

The impact statement will take into account how environmental conditions and natural hazards, such as severe or extreme weather conditions and external events (e.g. earthquake, flooding, drought, ice jams, landslides, erosion, subsidence, fire, outflow conditions, effects of freeze-thaw cycles), could adversely affect the designated project and how this in turn could result in impacts to environmental, health, social and economic conditions. These events will be considered in different probability patterns (i.e. 5-year flood vs. 100-year flood). The focus should be on credible external events that have a reasonable probability of occurring and whose environmental effects could be significant without careful management. The impact statement should also take account of how the environmental effects of the project could have positive effects on environmental, health, social and economic conditions.

The impact statement must:

- provide details of planning, design and construction strategies intended to minimize the potential adverse environmental effects of the environment on the project;
- identify any areas of potential wind or water erosion;
- describe mitigation measures that can be implemented in anticipation of or in preparation for the effects of the environment on the project;
- describe possible mitigation measures to address adverse environmental, health, social and economic effects resulting from the effects of the environment on the project;

- identify the project's sensitivity/vulnerability to climate change (under both average and extreme conditions);
- describe the project's climate resilience and how climate change impacts have been integrated into the project design and planning throughout the life of the project, and describe the climate data, projections and related information used to assess risks over the life of the project;
- describe all known and relevant trends in meteorological events, weather patterns or physical changes in the environment that are expected to result from climate change, and incorporate this information into a risk assessment as contributing or complicating factors for accidents and malfunctions. Provide mitigation measures (both passive and active) that the proponent is prepared to take to minimize the frequency, severity and consequences of these projected effects; and
- describe measures to enhance the positive environmental, health, social and economic effects resulting from the effects of the environment on the project.

Further guidance on how to conduct a climate change resilience assessment can be found in the draft SACC developed by ECCC.

22. Canada's ability to meet its environmental obligations

The Government of Canada, through the *Impact Assessment Act*, recognizes that impact assessment contributes to Canada's understanding and ability to meet its environmental obligations.

In accordance with paragraph 22(1)(*i*) of the *Impact Assessment Act* and paragraph 183(2)(j) of the *Canadian Energy Regulator Act*, the impact statement should describe the effects of the project in the context of obligations, focusing on the obligations and commitments of the Government of Canada relevant to the decision-making process.

The proponent should provide the following information to inform this analysis:

- Provide a list of federal environmental obligations that may be relevant to the project. Provide an appropriate summary or concordance table indicating where the impact statement or integrated application of each of the identified and listed federal environmental obligations has been considered.
- Where environmental obligations are addressed in the impact statement, they must be integrated into an appropriate assessment of possible effects and applicable mitigation measures. The assessment should include an analysis of how the project could adversely affect or contribute to Canada's efforts to meet any relevant environmental obligations.

The type and extent of the analysis could range from a provision requiring a rigorous justification to a detailed analysis based on the specifics of the anticipated effects and cover the environmental obligation or commitment.

The impact statement should take account of the need for mitigation and follow-up measures related to Canada's environmental obligations. Measures proposed to mitigate the adverse effects of a designated project may reduce a project's interference with an environmental obligation. The implementation of mitigation or complementary measures may also ensure that a designated project contributes to the Government of Canada's ability to meet its environmental obligations.

The impact statement may also present the proponent's views on the extent to which the effects of the project would adversely affect or contribute to the Government of Canada's ability to meet its environmental obligations, given the proposed mitigation measures.

The proponent should refer to the Agency's and the CER's guidance documents on this topic, as well as section 13.5 of this document for additional information on GHG emissions and climate change.

23. Description of the project's contribution to sustainability

In the *Impact Assessment Act*, "sustainability" is defined as "the ability to protect the environment, contribute to the social and economic well-being of the people of Canada and preserve their health in a manner that benefits present and future generations."

As part of the preparatory phase, the public, Indigenous groups and stakeholders will be engaged to identify the key issues that they consider important. This engagement will help establish the framework of the assessment of the project's contribution to sustainability. When assessing a project's contribution to sustainability, the impact statement should consider the VCs that participants consider important. Sustainability is contextual and project-dependent and, as such, may be defined differently by communities, or even by groups within those communities. In addition, the impact statement must also consider the VCs:

- that could be affected in the long term;
- that may interact with other VCs;
- that may interact with the potential effects of the designated project;
- that may interact with project activities.

The impact statement should characterize a project's contribution to sustainability. It should describe the context of a particular project, including the issues that are important to participants, the diversity of views expressed, and the selection of VCs.

Once the analysis of the potential effects of a project has been conducted, the principles of sustainability should be applied:

- take into account the links and interdependence between human and ecological systems;
- take into account the well-being of present and future generations;
- maximize the overall benefits and minimize the adverse effects of the designated project;
- apply the precautionary principle, taking uncertainty and the risk of irreversible harm into account.

The impact statement must describe how the sustainability principles (described above) have been applied and present the conclusions drawn from this analysis. This summary should be qualitative but may rely on quantitative data where appropriate.

In addition, the impact statement must:

- indicate how the project planning and design take sustainability principles into account at all stages;
- describe the process for selecting preferred alternatives and alternative means of carrying out the project and how sustainability principles were considered;
- indicate how follow-up, management and reporting systems take account of sustainability principles and seek to ensure continuous progress towards sustainability;
- describe the ecological, health, social and economic benefits of the project to local communities in the study area, potentially affected Indigenous groups, regional, provincial or territorial governments, or the federal government;
- describe the engagement of potentially affected Indigenous groups and describe actions and commitments to ensure the sustainability of Indigenous groups' livelihoods, traditional use of the site, culture and well-being.

The proponent should consult the Agency's guidance documents on this subject, including the guidance document Considering the extent to which a project contributes to sustainability and the framework Implementation of the sustainability guidance.

24. Follow-up programs

A follow-up program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. The information obtained can be used to determine whether additional measures are needed (adaptive management) to deal with unanticipated outcomes. Adaptive management is not considered a mitigation measure; it is an environmental management best practice. If the follow-up program indicates that corrective action is required, the proposed approach to manage the measure should be identified and implemented. The follow-up program will explain

the uncertainties surrounding the effects and whether these uncertainties are related to impact assessment predictions or the effectiveness of mitigation measures.

Follow-up programs are an opportunity to continue to consult affected Indigenous groups and, if undertaken collaboratively, can support solution-oriented approaches to adaptive management through early identification of problems in follow-up programs and appropriate solutions that take Indigenous knowledge into account. If a regional assessment is underway or has been completed in the project area, the proponent should use the resulting information to inform the factors to be considered in its follow-up program.

The factors to be considered in developing an environmental, health, social or economic effects follow-up program, as appropriate, include, but are not limited, to:

- VCs identified during the impact assessment for which residual adverse effects are expected or uncertain;
- the nature of concerns raised by the public and Indigenous groups about the project;
- Suggestions from Indigenous groups and local communities on the design of and participation in follow-up programs;
- the integration of Indigenous and community knowledge, if available;
- the accuracy of the predictions;
- an assessment of the effectiveness of mitigation measures;
- the efficiency of new or unproven techniques and technologies;
- disproportionate effects highlighted by the GBA+;
- the nature of cumulative effects;
- the nature, extent and complexity of the program;
- the level of uncertainty regarding the effectiveness of proposed mitigation measures;
- any technically and economically feasible measures to manage the effects if the mitigation measures applied do not work as intended;
- whether there was little scientific knowledge of effects in the environmental assessment;
- the parties that will be involved in implementing the follow-up program and reviewing its results;
- the duration of follow-up program activities, which may vary depending on the VCs assessed;
- any existing follow-up programs relevant to the project;
- the commitments made by the proponent when the project was reviewed;
- the compensation programs that will be proposed to offset residual effects;
- how the results of the follow-up program will be communicated to interested parties;
- triggers for adaptive management of any unacceptable or unexpected outcomes.

Monitoring is an essential component of effective follow-up programs. Monitoring can determine the potential for environmental, health, social or economic degradation at any stage of project

development. Monitoring can also assist in developing clearly defined action plans and emergency response procedures to address the protection of the environment, health, socio-economic conditions and human safety.

24.1 Framework for the monitoring program

The duration of the follow-up program should be as long as necessary to verify the accuracy of environmental, health, social and economic impacts predicted during the impact assessment and to assess the effectiveness of mitigation measures.

The impact statement must present a follow-up program that includes:

- the objectives of the follow-up program and the VCs targeted by the program;
- a list of project aspects requiring follow-up (work, company and activities);
- the main characteristics of the recommended follow-ups, including, but not limited to, for each of the follow-ups
    - the objectives to be achieved
    - a list of the parameters to be measured, including the recommended methodology for each parameter;
    - the time period(s) involved (e.g. spring flood period, fish migration period), frequency and time frame;
- the response mechanism used in the event of unanticipated environmental effects or impacts on Indigenous rights and cultures;
- the mechanism for disseminating the results of the follow-ups (deliverables) to relevant stakeholders;
- the accessibility and sharing of data for the general public;
- the involvement of local and regional Indigenous organizations in the design and implementation of the follow-up program, the assessment of follow-up results and any updates, including a mechanism for communication between these organizations and the proponent.

To accompany the description of the follow-up program, it is recommended that a table be presented showing for each of the recommended follow-up programs the objectives pursued (general and specific), the parameters selected and the associated methodologies, and the frequency of follow-up. It is also recommended that an overall schedule be presented in the form of a table compiling all of the stages of achievement for each of the follow-ups, including all deliverables (baseline status, follow-up protocol, work and follow-up reports, etc.).

24.2 Monitoring the follow-up program

The impact statement should describe the environmental, health, social and economic monitoring to be established as part of the follow-up program.

In particular, the impact statement must provide an overview of the preliminary environmental, health, social and economic monitoring program, which includes:

- the identification of monitoring activities that pose risks to the environment, health, social and economic conditions or VCs, and the measures and means to protect these conditions;
- the identification of regulatory instruments that include a monitoring requirement for VCs;
- the definition of positions responsible for monitoring and compliance;
- a description of the follow-up methodology and documentation of environmental, health, social and economic issues;
- apply guidelines and methodologies similar to those used for reference conditions;
- post-construction follow-up should be carried out to:
- verify the project's impacts on migratory birds and species at risk following construction/operation;
- assess the effectiveness of the mitigation measures applied;
- a description of the methodology and mechanism for monitoring the effectiveness of mitigation and restoration measures. Measures to determine the success of restoration could include erosion control; soil restoration; repair of drainage tiles; reduction of soil compaction; and reduction of soil salinity;
- in relation to wetlands:
    - Monitor all seeding bi-annually (i.e. late spring and fall) in subsequent years and undertake additional seeding, if necessary, until vegetation is established and continues to grow without further intervention.
    - Monitor post-construction impacts on wetland functions. A follow-up program to monitor wetland functions should be developed so that the type and quantity of each wetland function are considered individually to determine the success of restoration, and each wetland function is reduced to the same type and quantity as observed during the baseline period.
- in relation to caribou:
    - Monitor the effects of the project on boreal caribou and their critical habitat to verify impact assessment predictions, ensure that mitigation measures are effective, and determine if unanticipated impacts occur in the project area.
    - Monitoring methods should be consistent with standardized/established methods and include a robust before/after impact assessment design that quantitatively assesses the potential impacts of the project and identifies any adaptive management that may be required.
    - The methodology provided should include a timetable for follow-up program implementation.
    - The methodology should include a description of the performance indicators that will be used to assess the effectiveness of mitigation measures.

- Identify the circumstances and mechanisms under which corrective or adaptive measures may be implemented to address any issues identified through follow-up programs or environmental monitoring. For example, if unanticipated effects occur or if the significance of the effects is greater than expected.

- a description of the groundwater and surface water monitoring programs during the construction, closure and decommissioning period.
- a description of monitoring characteristics, where these are foreseeable (e.g. location of interventions, planned protocols, list of measured parameters, analytical methods used, schedule, human and financial resources required);
- a description of the promoter's response mechanisms in the event of non-compliance with legal and environmental requirements or with obligations imposed on contractors by the provisions of their contracts;
- quantitative thresholds that will trigger the need for corrective action;
- a description of how monitoring results will be used to trigger the proponent's response mechanisms for air pollutants that do not have established thresholds for health effects (e.g. CAAQS for common air pollutants, such as fine particles and nitrogen dioxide);
- procedures for the production of monitoring reports (number, content, frequency, format, duration, geographical scope) to be transmitted to the authorities concerned;
- plans, including funding options, to engage Indigenous peoples and local communities in monitoring, where appropriate;
- quality assurance and quality control measures to be applied to monitoring programs.

24.3 Inspection, monitoring and follow-up

In relation to the preceding sections on monitoring and follow-up, the following monitoring requirements of the *Canadian Energy Regulator Act* should be taken into consideration:

- describe inspection plans to ensure compliance with the biophysical and socio-economic commitments as set out in OPR sections 48, 53 and 54. Inspection plans must be sufficiently detailed to demonstrate their relevance and effectiveness and must:
  - identify positions responsible for environmental monitoring and compliance
  - and confirm that they are not related to the contractor,
  - as stipulated in OPR sections 53 and 54.
  - refer to inspection methods and describe the reporting and accountability structure applicable to environmental inspectors;
  - specify the minimum skills and experience required, including required training for persons performing inspection and monitoring functions, as indicated in OPR sections 46 and 54.
- describe the monitoring and control program for the protection of the pipeline, the public and the environment as required by OPR section 39. The monitoring program must be

sufficiently detailed to demonstrate its relevance and effectiveness and must include methods for:

  - identifying and monitoring environmental and socio-economic issues;
  - addressing specific environmental and socio-economic issues related to the project,
  - including conducting site-specific sampling programs or surveys, as appropriate;
  - verifying the effectiveness of the mitigation and restoration measures with respect to the established restoration criteria (see the requirements for each aspect in Table A-2 of the Filing Guidance), as well as the applicant's performance measures and targets for each mitigation measure;
  - the frequency or schedule for implementing the procedures identified above;
  - criteria for determining whether environmental and socio-economic issues require specific monitoring;

- consider any application-specific aspects of greater concern and determine whether further follow-up programs are required for those aspects.
- identify the aspects and procedures that constitute follow-up under the *Impact Assessment Act*.
- describe follow-up programs of surface and groundwater during the operation, and post-construction period.

25. Assessment summary

The proponent must prepare a separate plain language summary of the impact statement in both of Canada's official languages (English and French). The summary must be sufficiently detailed for the reader to understand the project, any potential environmental, health, social and economic effects, potential adverse effects on Indigenous groups, proposed mitigation measures, residual effects and any required follow-up program.

The evaluation summary provides the proponent with an opportunity to demonstrate the link between the issues raised in the preparatory stage and the issues addressed in the assessment. This summary should be divided according to VC, so the proponent can demonstrate the completeness of the assessment and provide the results of the analysis. The summary must include key maps or figures illustrating the location and major components of the project.

PART 2 – REFERENCE DOCUMENTS

Durability

Interim Guidance: Considering the Extent to which a Project Contributes to Sustainability https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/interim-guidance-considering.html. Impact Assessment Agency of Canada. 2019.

Interim Framework: Implementation of the Sustainability Guidance https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/interim-guidance.html. Impact Assessment Agency of Canada. 2019.

Purpose and need of

Guidance: "Need for", "Purpose of", "Alternatives to" and "Alternative means" https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-need-for-purpose-of-alternatives-to-and-alternative-means.html. Impact Assessment Agency of Canada. 2019.

Policy Context: "Need for", "Purpose of", "Alternatives to" and "Alternative means" https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/need-for-purpose-of-alternatives-to-and-alternative-means.html. Impact Assessment Agency of Canada. 2019.

Indigenous participation and mobilisation

Interim Policy Context: Indigenous Participation in Impact Assessment https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/interim-policy-indigenous-participation-ia.html. Impact Assessment Agency of Canada. 2019.

Interim Guidance: Indigenous Participation in Impact Assessment *https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/interim-guidance-indigenous-participation-ia.html.* Impact Assessment Agency of Canada. 2019.

Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/assessment-potential-impacts-rights-indigenous-peoples.html. Impact Assessment Agency of Canada. 2019.

Interim Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/interim-guidance-assessment-potential-impacts-rights-indigenous-peoples.html. Impact Assessment Agency of Canada. 2019.

Interim Guidance: Collaboration with Indigenous Peoples in Impact Assessments https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/collaboration-indigenous-peoples-ia.html. Impact Assessment Agency of Canada. 2019.

Public Participation

Interim Framework: Public Participation Under the Impact Assessment Act https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/framework-public-participation.html. Impact Assessment Agency of Canada. 2019.

Interim Guidance: Public Participation under the Impact Assessment Act https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/interim-guidance-public-particaption-impact.html. Impact Assessment Agency of Canada. 2019.

Greenhouse gases and climate change

Draft Strategic Assessment of Climate Change https://www.strategicassessmentclimatechange.ca/. Environment and Climate Change Canada. 2019.

Policy Context: Considering Environmental Obligations and Commitments in Respect of Climate Change under the Impact Assessment Act https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/considering-environmental-obligations.html. Impact Assessment Agency of Canada. 2020.

GBA+

Interim Guidance: Gender-based Analysis Plus in Impact Assessment https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/gender-based-analysis.html. Impact Assessment Agency of Canada. 2019.

Human health

Guidance for Evaluating Human Health Impacts in Environmental Assessments: Country Foods, available at https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-country-foods.html. Health Canada. 2017.

Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise, available at https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-noise.html. Health Canada. 2017.

Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality, available at https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-air-quality.html. Health Canada. 2017.

Guidance for Assessing Human Health Impacts in Environmental Assessments: Water Quality, available at https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-water-quality.html. Health Canada. 2017.

Guidance for Evaluating Human Health Impacts in Environmental Assessments: Radiological Impacts, available at https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-radiological.html. Health Canada. 2017.

Social determinants of health and health inequalities, available at https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html. Public Health Agency of Canada. 2019.

*Parts I to VII of Health Canada's risk guidance documents are available at*https://www.canada.ca/en/health-canada/services/environmental-workplace-health/contaminated-sites/guidance-documents.html.Health Canada. 2017

Health Impact Assessments – Resources from the National Collaborating Centre for Environmental Health (NCCEH), available at: http://www.ncceh.ca/environmental-health-in-canada/health-agency-projects/health-impact-assessments. National Collaborating Centre for Environmental Health (NCCEH). 2019.

Social Impact Assessment in the Environmental Sector: health network support guide, available at: https://www.inspq.qc.ca/en/publications/1800. Institut national de santé publique du Québec. 2014.

Water quality

Mine Environment Neutral Drainage (MEND) Report 1.20.1 – Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. Prepared by William A. Price. Natural Resources Canada. 2009.

Canadian Water Quality Guidelines for the Protection of Aquatic Life available at http://ceqg-rcqe.ccme.ca/download/en/221. Canadian Council of Ministers of the Environment.
Mine Environment Neutral Drainage (MEND) Report 1.20.1 Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. Prepared by William A. Price. Natural Resources Canada. 2009.

Birds, migratory birds and their habitat

Bird Survey Inventories in Canada. Available at https://www.canada.ca/en/environment-climate-change/services/bird-surveys.html. Published by Environment and Climate Change Canada

Breeding Bird Atlases. Available at https://www.birdscanada.org/volunteer/atlas/?lang=EN. Compiled by Birds Canada

A Framework for the Scientific Assessment of Potential Project Impact on Birds. Prepared by Alan Hanson et al. Available at http://www.publications.gc.ca/collections/collection_2010/ec/CW69-5-508-eng.pdf. Environment Climate Change Canada. Technical Report Series Number 508
Migratory Birds Environmental Assessment Guideline. Prepared by Robert Milko. Available at http://publications.gc.ca/site/eng/78842/publication.html. Environment Climate Change Canada.

Operational Framework for Use of Conservation Allowances
(https://www.canada.ca/en/environment-climate-change/services/sustainable-development/publications/operational-framework-use-conservation-allowances.html)

NatureServe Conservation Status Assessments: Factors for Evaluating Species and Ecosystem Risk
https://www.natureserve.org/sites/default/files/publications/files/natureserveconservationstatusfactors_apr12_1.pdf

Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act (2012)
https://www.ceaa.gc.ca/Content/B/8/2/B82352FF-95F5-45F4-B7E2-B4ED27D809CB/Cumulative_Environmental_Effects-Technical_Guidance-Dec2014-eng.pdf

Bird Conservation Regions and strategies
https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies.html

Richard J. Barker, Matthew R. Schofield, William A. Link, John R. Sauer. 2018. On the reliability of N-mixture models for count data. Biometrics 74(1).
https://onlinelibrary.wiley.com/doi/full/10.1111/biom.12734

A Framework for the Scientific Assessment of Potential Project Impacts on Birds
http://publications.gc.ca/site/eng/9.567093/publication.html

Yip, D. A., L. Leston, E. M. Bayne, P. Sólymos and A. Grover. 2017. Experimentally derived detection distances from audio recordings and human observers enable integrated analysis of point count data. Avian Conservation and Ecology 12(1): 11.
www.ace-eco.org/vol12/iss1/art11/ACE-ECO-2017-997.pdf

ECCC Guidelines on Avoiding Harm to Migratory Birds
https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html

ECCC Guidelines on General nesting periods of migratory birds
https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html

A framework for the scientific assessment of potential project impacts on birds / [by] Alan Hanson... [et al.].
http://publications.gc.ca/site/eng/9.567093/publication.html . Environment and Climate Change Canada. Technical report nº 508.

Wetlands

Wetland ecological functions assessment : an overview of approaches, prepared by Alan Hanson *et al*. Available at http://publications.gc.ca/site/eng/9.565284/publication.html. Environment and Climate Change Canada. 2008.
Canadian Wetland Classification System. Produced by the National Wetlands Working Group. Available at http://www.wetlandpolicy.ca.

Wetland Network
http://www.wetlandnetwork.ca/index.php?g_int_AppLanguageId=1&
Birds, migratory birds and their habitat
http://publications.gc.ca/site/fra/9.565284/publication.html

Species at risk

Species at Risk Public Registry
https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Species at Risk Act Permitting Policy (proposed version) https://wildlife-species.canada.ca/species-risk-registry/document/default_e.cfm?documentID=2983

Scientific Review for the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. Environment Canada, 2011.
https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/Caribou_Full_0409_e.pdf

Canadian Wildlife Health Cooperative
http://www.cwhc-rcsf.ca/docs/WNS_Decontamination_Protocol-Mar2017.pdf

BOISVERT, J., P.-A. BERNIER, Y. DUBOIS and S. ROULEAU. 2019. Summary of protection and mitigation measures for turtles in Quebec concerning roads, gravel pits, quarries and agricultural and forest environments – For MFFP regional analysts and wildlife specialists. Quebec Turtle Recovery Team. 16 pages.

COSEWIC status reports. Available at: http://cosewic.ca/index.php/en-ca/status-reports

COSEWIC annual report. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-annual-reports/2018-2019.html

Species at risk
COSEWIC status reports. Developed by the Committee on the Status of Endangered Wildlife in Canada. Available at: http://cosewic.ca/index.php/en-ca/status-reports

PART 2 – ANNEXE 1: ASSESSMENT OF UPSTREAM GREENHOUSE GAS EMISSIONS

The upstream GHG assessment should be presented in a separate report and include two parts, Part A and Part B as described below.

Part A

Part A of the Upstream GHG Assessment must provide an estimate of GHG emissions associated with the upstream activities of the proposed project. The estimate of GHG emissions should:

- include GHG emissions in CO^2 equivalent on an annual basis for the operational life of the proposed project;
- be based on the maximum capacity of the project;
- relate to all processes upstream of the proposed project, including, but not limited to, the production, processing and transportation of natural gas supply;
- use verifiable emission intensities that are recent and relevant to the region and that reflect the sources of products that are expected to be received from the project, with realistic scenarios representing various sources of natural gas supply. Justification must be provided for the selection of these emission intensities.

All assumptions for the estimation must be stated and justified.

Part B

Part B of the Upstream GHG Emissions Assessment should present a qualitative discussion of the incremental effect of the upstream GHG emissions estimated in Part A. It should describe the conditions under which the upstream emissions estimated in Part A could occur whether or not the project proceeds.

- This discussion uses technical and economic information to estimate upstream natural gas production under various market and infrastructure assumptions. It also discusses (i) the potential impact of upstream GHG emissions associated with the project on Canada's overall GHG emissions and (ii) how additional natural gas production could affect global GHG emissions. This section includes a review of scenarios to compare results that depend on project implementation. For example, the results of upstream production in a scenario where the project does not proceed should be examined in relation to at least one scenario where the project does proceed.
- The term "additional" is used to refer to upstream production (and resulting emissions) that would occur solely as a result of the project.

- In general, when a project represents a new source of demand for upstream natural gas production or represents the only means of transporting upstream production, then it is expected to result in additional upstream production and GHG emissions. However, for upstream sectors with alternative transportation options, upstream production and GHG emissions associated with a project may not increase.

The relationship between production and emissions in Canada must also be assessed, including how proposed and existing GHG policies could affect upstream emissions intensity over time, and how additional upstream emissions are consistent with current GHG projections and policies. In terms of impacts on global emissions, incremental upstream production in Canada would result from a combination of shifting production and its emissions from elsewhere and increasing the total amount of production.

PART 3 – Additional Content for Guidelines under the *Canadian Energy Regulator Act*

1. Integration of Canadian Energy Regulator Requirements

The TISG Template, outlined in Part 2, sets out requirements for both the IAA and CER Act, with respect to impact assessment.

The TIS Guidelines will require meeting both IAA information requirements and the information requirements to comply with the CER Act. Part 3 sets out the CER Act requirements. For designated CER regulated projects, proponents should also refer to relevant CER interim guidance as well as guidance provided in the NEB Filing Manual which continues to be relevant (See Reference documents – Part 3).

The procedure or process for the development of TIS Guidelines that integrate the requirements of both Acts will be coordinated, to the extent possible, between the Agency and CER. The following requirements are taken from NEB's Filing Manual (2017).

2. Action Requested

2.1. Goal

The application states the request being made and what action is being requested of the CER.

2.2. Filing Requirements

The information that an application must include is set out in section 15 of the National Energy Board Rules of Practice and Procedure, 1995.

" 15.(1) Every application shall

- *a) contain a concise statement of the relevant facts, the provisions of the Act or any regulations made under the Act under which the application is made and the nature of, and justification for, the decision or order sought;*
- *b) contain, in addition to the information that is required by the Act and any regulations made under the Act, any other information that explains or supports the application, including information referred to in published policies and guidelines of the CER; and*
- *c) set out the name, address, telephone number and any other telecommunications numbers of the applicant and the applicant's authorized representative, if any.*

(2) Every application shall be divided into consecutively numbered paragraphs, each of which shall be confined as nearly as is practicable to a distinct portion of the subject-matter of the application."

2.3. Guidance

Applicants must, in addition to looking at the *Filing Manual*, have regard to the CER Act and regulations relevant to the filing for direction on what needs to be included.

3. Management Systems and Programs Under the OPR

3.1. Goal

To demonstrate how an applicant's management system required under the OPR will support and achieve adequate safety and environmental protection in the context of the current project application.

3.2. Filing Requirement

An applicant must provide:

- an overview of its management system, including a description of:
    - how programs required under the OPR are coordinated within the management system to promote safety and environmental protection; and
    - the process for any necessary modifications to the management system.

3.3. Guidance

The CER conducts ongoing reviews of company management systems and compliance with the requirements of the OPR through its auditing oversight. However, in addition to this, it is important for public transparency and clarity that applicants explain how safety and environmental protection are integrated, coordinated and controlled within their management systems and will be ensured for any proposed new facility.

A carefully-designed and well-implemented management system supports a strong culture of safety and is fundamental to keeping people safe and protecting the environment. Sections 6.1 to 6.6 of the OPR detail the required elements of a company's management system. It must be a systematic approach designed to effectively manage and reduce risk through necessary organizational structures, resources, accountabilities, policies, processes and procedures, and must include measures to evaluate effectiveness and promote continual improvement.

A company's management system must also coordinate the following five programs:

- Emergency Management Program to ensure appropriate emergency preparedness and response (OPR section 32).
- Integrity Management Program to ensure the pipeline system continually operates within its design parameters (OPR section 40).

- Safety Management Program to protect workers and the public from occupational and process hazards (OPR section 47).
- Security Management Program to protect people, property and the environment from malicious damage (OPR section 47.1).
- Environmental Protection Program to avoid or reduce adverse effects on the environment (OPR section 48).

Section 6.5 of the OPR lists a number of processes and requirements that must be part of a company's management system and each of the above five programs.

Section 6.2 requires the appointment of an Accountable Officer and that their name and acceptance of responsibilities be filed with the CER. For further information on the OPR and related supporting documentation, please refer to the CER's website.

A company's management systems applies to the entire lifecycle of a project, from planning and design, through construction and operation, to abandonment. It is therefore relevant at all stages of a project, including the application stage.

The CER expects an applicant to have applied relevant components of its management system and programs to the planning and design of the designated project and related application documents, and to have reviewed those components for necessary modification in the event the designated project goes ahead.

An application that is lacking (such as containing an incomplete discussion of hazards, risks and controls) might indicate that the applicant's management system and program components are inadequate. The CER expects companies to prevent such deficiencies, correct any that are identified, avoid similar deficiencies in future applications, and to apply lessons learned as broadly as possible.

4. Engagement

4.1. Goal

The application outlines the corporate policy or vision with respect to engagement and the principles and goals that guide the applicant's Engagement Program.

4.2. Filing Requirements

Provide an overview of the company's engagement program, which should include:

- the corporate policy or vision with respect to engagement.
- the principles and goals established for the applicant's Engagement Program; and

- a copy of the Indigenous engagement policy, along with any more specific related documented policies and principles, such as, for collecting traditional knowledge or traditional use information.

4.3. Guidance

The CER expects the applicant to have an engagement program to anticipate, prevent, mitigate and manage conditions that may impact individuals or communities. An engagement program must be well integrated into the company's management system to ensure the protection of the public, employees, property and the environment throughout the lifecycle (design, construction, operation, maintenance and abandonment) of a pipeline system. An engagement program should be based on the usual elements of a management system (for example, those described in theOPR). More information is provided in the CER's draft expectations - Public Participation Program [Filing A22289][8].

The CER also expects the applicant to take into account the specific language needs of the persons or communities likely to be affected and what it describes in the application as its reasoning in this regard. In accordance with section 41 of the Official Languages Act, the CER is also committed to fostering the full recognition and use of English and French in Canadian society. The CER recognizes the importance of taking official languages into account in the development and implementation of an engagement program, in order to promote effective communication with the people concerned, in the language of their choice.

5. Notification of Commercial Third Parties

5.1. Goal

The application must include evidence that all interested commercial third parties who may be affected by the application have been notified of the existence of the application.

5.2. Filing Requirements

1. Confirm that all commercial third parties that may be affected by the outcome of the application have been notified, and include:
    - a description of the means used to communicate with these parties;
    - the date the parties received the notification.
2. Provide details on concerns raised by third parties. For example:
    - confirmation that none of them have raised concerns;
    - confirmation that the concerns raised have been resolved;
    - the list of commercial third parties that have raised outstanding concerns and a statement of those concerns.

3. List interested third parties who have self-identified as such and confirm that they have received notification.
4. Provide an explanation in the event that notification of commercial third parties was not deemed necessary.

5.3. Guidance

5.3.1. Identification of Commercial Third Parties

Commercial third parties include those that would be directly or indirectly affected by the outcome of the application. This would be mandatory for shippers and potentially producers, users and other pipelines. Here are some examples of cases where some commercial third parties are affected by an application:

- all shippers need to be notified of all applications for tolls and tariffs filed under Part IV of the NEB Act and any applications that could have a significant impact on tolls and tariffs;
- all shippers, suppliers and users will be affected if the outcome of the application significantly affects the service provided by the pipeline;
- operators of competing facilities, whether or not they are regulated by the NEB, will be affected commercial third parties where it is reasonable to believe that the outcome of the application will have a significant adverse effect on their operation.

Third parties associated with physical construction activities (e.g. contractors, material suppliers, consultants) or who provide food and accommodation services are not normally considered to be affected commercial third parties.

5.3.2. Notification

Inform commercial third parties that an application has been or will be submitted to the NEB and provide a brief description. Notification should normally occur no later than the date the application is filed with the NEB. A copy of the application may be provided at the same time as the notification, or upon request; it may still serve as a notification.

When determining the level of detail of the notification, consider the following factors:

- scope of the project;
- potential impact on commercial third parties;
- nature of concerns raised by commercial third parties, if any;
- resolution of concerns raised.

In general, the greater the scope of the project and potential impact on commercial third parties, the greater the need for information. In addition, more detailed information will normally be required when concerns have been raised by commercial third parties and remain unresolved at the time of filing.

Where the outcome of the application may affect certain commercial third parties, notify the parties concerned. If, however, a group with common interests could be affected, such as western Canadian producers or a user group, the applicant may choose to notify a recognized organization representative of the group, such as the Canadian Association of Petroleum Producers or the Industrial Gas Users Association.

5.3.3. Concerns

Where concerns have been raised and resolved, include a discussion of the resolution method if it can assist the NEB in making a decision. When providing the list of unresolved concerns, provide any other information that will help the NEB understand the issues, including a description of the efforts made to reach an agreement, such as a summary of the consultation process that was used before the application was filed.

5.3.4. Interested third parties who have self-identified as such

Interested third parties who have identified themselves as such are parties who have indicated to the applicant that they have an interest in the application or in one or more types of applications filed with the NEB.

When commercial third parties may or may not be affected by the application, the NEB expects the applicant to notify all third parties who have self-identified as such.

5.3.5. When notification is not required

Notification may not be necessary if the outcome of the application does not result in significant effects on commercial third parties, for example:

- applications for routine maintenance and repair of facilities where:
    - access to the facilities could be temporarily interrupted during construction, while service would not be interrupted; or
    - the impact on tolls would be negligible or considered a normal adjustment to a negotiated toll agreement;
- applications to construct a pipeline operated by the owner and where the owner is the sole shipper;
- applications for crossing, traversing, commissioning, diversion, site class alteration or right-of-entry matters that would not affect the tolls or the operation of the pipeline;
- applications to change the name of a pipeline owner without selling the pipeline or changing operations.

6. Units of measure, conversion factors and product descriptions

6.1. Units of measure and conversion factors

For evaluation purposes, it is preferable that the units of measure cited in the applications be those of the International System of Units (SI) where possible; however, it is useful to have imperial units included as well.

The following conversion factors should be used:

- millimetre (mm) = 0.0394 inches (in)
- metre (m) = 3.28 feet (ft)
- kilometre (km) = 0.62 miles (mi)
- cubic metre (m^3) = 35.3 cubic feet (cf)
- cubic metre = 6.29 barrels (bbl)
- kilopascal (kPa) = 0.145 pound per square inch (psi)

If other conversion rates are used, indicate this fact and provide the rates used.

6.2. Product description

For gas volumes, market requirements, estimates of reserves, and productive capacity estimates will be at a temperature of 15ºC and an absolute pressure of 101.325 kPa. Gas composition should be expressed in mole percent, and the heating value of the gas should be expressed in megajoules per cubic metre (MJ/m^3). Volumes are requested to be in metric units as cubic metres (m^3) and production rates as cubic metres per day (m^3/d). The imperial equivalent would be cubic feet (cf) and cubic feet per day (cf/d) respectively.

7. Technical Matters

7.1. Engineering Design Details

7.1.1. Goal

The application includes all necessary design details of the proposed project to give an understanding of the nature of the proposed project.

7.1.2. Filing Requirements

1. Describe the fluid type and chemical composition.
2. If the Designated Project has piping, provide the following information:
    - pipe outside diameters;
    - pipe material type and grade;
    - pipe wall thickness;
    - maximum operating pressure (MOP);

- estimate of pipe length by province for each change in diameter, material grade and wall thickness
- valve spacing and a map showing valve locations;
- minimum landfill depth(s) and typical patterns (crossings, etc.);
- class of location;
- description of proposed pipe coatings; and
- description of corrosion control devices and installations;
- general description of the corrosion control elements and facilities.

3. If the designated project involves pigging facilities, provide the following information:
    - pipe outside diameters;
    - pipe material types and grades
    - pipe wall thickness;
    - MOP;
    - pig trap locations;
    - pig trap pressure ratings;
    - a description of the pig trap closure device; and
    - a general description of the corrosion control elements and facilities

4. If the proposed project involves compressor or pump facilities, provide:
    - pipe outside diameters;
    - pipe material types and grades;
    - pipe wall thicknesses;
    - MOP and inlet and outlet design pressures;
    - an indication of the presence of surge control systems;
    - type and power of pumps or compressor units;
    - fuel type and source for pumps or compressor units;
    - a station schematic showing buildings and all major piping and valves including connections to existing pipeline systems;
    - a plot plan of the facility including the location of roads and fences;
    - description of boilers and pressure vessels;
    - a general description of the corrosion control elements and facilities and overpressure
      control; and
    - a general description of the pressure control and overpressure protection devices.

5. If the proposed project involves pressure regulating or metering facilities, provide:
    - a description of the gas or fluid analysis system;
    - minimum and maximum station flows and associated inlet and outlet pressures;
    - a general description of the pressure control and overpressure protection devices;
    - a description of the type and frequency of H2S analysis in the inlet gas stream;

- a station schematic showing buildings and all major piping and valves including connections to existing pipeline systems;
- a plot plan of the facility including the location of roads and fences;
- pipe outside diameter;
- pipe material type and grade;
- pipe wall thickness;
- MOP;
- a general description of the corrosion control elements and facilities; and
- if the measurement is being done for custody transfer purposes, include a description of the measurement equipment, including:
    - physical size;
    - flow capacity;
    - measurement accuracy;
    - meter type;
    - number of meters; and
    - proving method.

6. If the proposed project involves new control system facilities for a pipeline, plant or station, provide:
    - a basic description of the supervisory control and data acquisition (SCADA) system related to the proposed facility, including the parameters monitored;
    - a basic description of the leak detection system including its sensitivity and accuracy; and
    - a basic description of the emergency shut down system.
7. If the proposed project involves facilities not mentioned above, provide a technical description of the proposed facilities that includes an equivalent level of information to that listed above.
8. If the proposed project involves a building, include the building's use and dimensions.

7.2. Engineering Design Principles

7.2.1. Goal

The application includes information on the engineering codes, standards and regulations applicable to the project as well as information with respect to any special engineering design challenges associated with the project.

7.2.2. Filing Requirements

1. Confirm project activities will follow the requirements of the latest version of Canadian Standards Association Standard Z662, Oil and Gas Pipeline Systems (CSA Z662).

2. If the proposed project uses any of the Annexes, in whole or in part, that form part of CSA Z662, provide a statement indicating which Annex is being used and for what purpose.
3. If any portion of the proposed project involves a hydrocarbon pipeline, provide a statement confirming compliance with the latest version of the OPR or PPR.
4. Provide a listing of all primary codes and standards, including the version and date of issue that will be followed in the design, material selection, construction, operation and maintenance for each element of the applied-for facility, including:
    - pipe;
    - coatings;
    - valves;
    - fittings;
    - cathodic protection systems;
    - compressors and pumps;
    - regulators and control valves;
    - liquid tanks and other storage facilities;
    - boilers or pressure vessels (including certifying authority used or required);
    - electrical systems;
    - Supervisory Control and Data Acquisition (SCADA) system;
    - pressure control and overpressure protection;
    - leak detection; and
    - buildings.

Where there is a choice in the code or standard selected, provide a brief reason why the referenced code or standard is considered the appropriate code.

5. Provide a statement that the applicant undertakes to carry out the project in accordance with all relevant company manuals and that the manuals in question comply with:
    - the OPR, if applicable;
    - the PPR, if applicable; and
    - the codes and standards for the project.

Keep the latest versions of these manuals available for Commission audit and file copies upon request.

6. If the proposed facility will be subject to conditions not specifically addressed in CSA Z662 (e.g., seismic issues, fracture control, slope instability, pipe buoyancy, or lack of support due to streambank erosion) provide:
    - written statement from a qualified professional engineer that the project has been assessed and designed for the potential effects of the condition that is not

specifically
addressed in CSA Z662; and
- a description of the designs and measures required to safeguard the pipeline.

7. If the proposed project involves horizontal directional drilling, provide:
    - a preliminary feasibility report detailing the assessment that was completed to determine
      that horizontal directional drilling could be successfully completed; and
    - a description of the contingency plan to be used if the horizontal directional drill is not successful.

8. If the proposed project involves new materials, provide, in tabular format, material supply chain information (e.g., forming and manufacturing locations) and the associated Quality Assurance verification activity.

9. If the proposed project involves the reuse of materials, provide an engineering assessment in accordance with CSA Z662 that indicates its suitability for the intended service.

7.3. Onshore Pipeline Regulations

7.3.1. Goal

The application meets the requirements of the OPR.

7.3.2. Filing Requirements

1. If any portion of the designated project involves a hydrocarbon pipeline system requiring development of designs, specifications, programs, manuals, procedures, measures or plans for which no standard is set out in the OPR, provide copies to the Commission for approval. [OPR, subsection 5.1(1)].
2. If the project design is non-routine in nature or must incorporate unique challenges because of its geographical location (e.g., sub-sea pipelines; pipelines located north of the 60th parallel; pipelines transporting sour gas, acid gas or high vapour pressure products; or pipelines operating under any extreme or unusual circumstances), provide a quality assurance (QA) program outlining the actions required to ensure the materials purchased for use in the proposed facility are appropriate for their intended service (OPR, section 15). See the Guidance topic below for further details.

7.3.3. Guidance

Quality Assurance Program for Materials

The QA program in the above filing requirement ensures that materials purchased meet the company's specified requirements. The rigor of the QA program should be consistent with the scale of the purchase order and its intended application (e.g., the purchase of a single small diameter fitting would not warrant the same degree of scrutiny as would a major pipeline construction project).

QA programs can include the elements of a recognized standard such as the International Organization for Standardization (ISO) 9000 series or quality management systems, and, where appropriate:

- requirements for the pipeline company's (or its agents) evaluation of the manufacturer's or supplier's quality management system prior to the award of any contract;
- requirements for company (or its agents) audits and inspections during manufacture and fabrication, shipping, storage, etc.;
- requirements for random and progressive product testing;
- inspection procedures and inspector qualifications;
- requirements for handling and review of documentation;
- a system for managing non-conformances to specifications; and
- procedures for company acceptance of products.

8. Economic and financial issues

Economic information must include details on:

- supply;
- transportation;
- markets;
- financing.

The overall Goal of submitting facility economic information is to demonstrate that the proposed facilities will be used and useful, that application fees will be paid, and sufficient funds will be available for abandonment.

8.1. Supply

8.1.1. Goal

The application includes information indicating that there is or will be adequate supply to support the use of the pipeline, taking into account all potential supply sources that could reasonably be expected to be sourced by the applied-for facilities over their expected economic life.

8.1.2. Filing Requirements

Provide:

1. a description of each commodity (e.g., crude oil, natural gas or NGL);
2. a discussion of all potential supply sources;
3. a forecast of the productive capacity for each commodity over the economic life of the facilities; and
4. for pipelines with contracted capacity, a discussion of the contractual arrangements underpinning the supply.

8.1.3. Guidance

The level of detail to be provided should be based on the following elements:

- capacity or throughput;
- the nature and complexity of the source of supply;
- potential effects on the public interest, commercial or otherwise.

In general, the higher the capacity or expected throughput, the more information on the supply is required. Projects that have more significant potential effects on third parties or the environment may require additional information to demonstrate that the project is in the public interest.

8.1.4. Commodity Description

Describe each commodity that would be affected by the applied-for facilities. Adhere to the guidelines for describing commodities provided in 'Measurement, Conversion Factors and Commodity Description'.

8.1.5. Resources

Describe each current and potential supply source that the applied-for facilities are relying upon, including the methodology used to derive these estimates.

8.1.6. Productive Capacity

Forecast the current and future production over the economic life of the project. Include forecasts from:

- the various supply sources; and
- conventional and unconventional production as well as production from other basins that could be sourced.

Clearly describe the sources for and the methodology used to derive the forecasts.

8.1.7. Contractual Arrangements

For pipelines with contracted capacity, include a description of any relevant contractual arrangements underpinning the supply arrangements. Also include key contractual terms such as length of contract and volumes under contract, where available.

8.2. Transportation

8.2.1. Goal

The application includes information indicating that the volumes to be transported are appropriate for the applied-for facilities and that the proposed facilities are likely to be utilized at a reasonable level over their economic life.

8.2.2. Filing Requirements

Pipeline capacity

Provide a justification demonstrating that the capacity of the new pipeline is appropriate given the production or supply volumes that would supply the pipeline.

Throughput

For pipelines whose capacity is contracted, provide information on the contractual arrangements that underpin the anticipated throughput.

For all other pipelines, provide forecasts of expected annual throughput by commodity type, receipt point and delivery point over the economic service life of the facilities applied for.

Provide:

- the theoretical and renewable capacity of the planned facilities on a daily, seasonal and annual basis in relation to the anticipated needs, if any;
- the throughput data and calculation formulas used to determine the daily or hourly capacity, as applicable, of the proposed facilities, and the underlying assumptions and parameters, including a description of the properties of the gas.

8.2.3. Guidance

Information submitted on transportation matters should:

- demonstrate that the capacity of the applied-for facilities is appropriate for the commodities and volumes that would be transported in the pipeline; and
- provide sufficient evidence to assure the CER that the applied-for facilities will be used at a reasonable level over their economic life.

Information on pipeline capacity, projected throughput or contracted volumes and, if applicable, supply available to the pipeline, could be provided in tabular format. Where it would provide clarity, a graphical representation could also be included.

Pipeline Capacity

Provide an estimate of the average annual capacity of the pipeline for the commodity transported.

In all cases where there will be a substantial difference between pipeline capacity and contracted volumes or projected throughput, include an explanation of the difference.

In the case where the subject pipeline is one of a number of pipelines serving a particular supply area, provide a description of the overall service for the area and the role the subject pipeline plays in serving the area relative to throughput volumes and productive capacity for the supply area.

Contractual Arrangements

Transportation agreement evidence is required .

Describe the contracted volume and term by shipper. When possible, submit evidence of the transportation agreements, such as signed execution sheets and copies of the contracts. Contractual evidence must be of sufficient detail to assure the CER that the facilities will be used at a reasonable level and that demand charges will be paid.

8.3. Markets

8.3.1. Goal

The application includes information indicating that adequate markets exist for the incremental volumes that would be available to the marketplace as a result of the applied-for facilities.

8.3.2. Filing Requirements

Provide:

1. an analysis of the market in which the commodity is expected to be used or consumed; and
2. a discussion of the physical capability of upstream and downstream facilities to accept the incremental volumes that would be received and delivered.

8.3.3. Guidance

Information on markets is required to assure the CER that there is sufficient demand to absorb the incremental volumes and, where applicable, physical capability in the upstream and downstream facilities to accept the incremental volumes. Where long-term transportation and downstream arrangements are in place, the required market information will be more general in nature, but must be adequate to allow the CER to determine whether the market demand will be sufficient to support the economic feasibility of the pipeline.

The level of detail will correspond to:

- the magnitude of the incremental volumes that would be delivered into the market;
- the degree of competition from other supply areas and from other fuels in the market to be served; and

- the potential impact on the public interest, commercial or otherwise.

Generally, the greater the projected increase in volumes delivered to the marketplace, the greater the amount of market information that would be required. Designated projects that have a larger potential impact on third parties or the environment may require filing additional information to demonstrate that the project is in the public interest.

8.3.4. Description of the Market

Describe the market that will receive the commodity, including, where applicable:

- where the commodity could be delivered (e.g., gas hub or designated refinery);
- the potential competition to serve the market or the market areas from other pipelines;
- energy sources; and
- transportation systems.

8.3.5. Ability of Upstream and Downstream Facilities to Accept Incremental Volumes

Provide assurance that upstream and downstream connection facilities will be able to effectively accept additional volumes received or transmitted.

8.4. Financial Issues and Resources

8.4.1. Goals

The application must include an assessment of:

- the applicant's ability to fund the proposed facilities;
- how facilities are funded and the potential costs associated with risks and liabilities that may arise during the construction and operation of the project, including a significant incident (see the National Energy Board's Event Reporting Guidelines for a definition of a significant incident);
- any changes that the facility financing arrangements may have to the risk assumed by the company;
- the estimated abandonment costs of the proposed facilities and the process and mechanism for setting aside funds to cover these costs;
- the impact on the tolls of the proposed facilities.

8.4.2. Filing Requirements

1. Provide evidence that the applicant is able to fund the proposed facilities.
2. Demonstrate that the applicant can manage potential costs associated with risks and liabilities that may arise during the construction and operation of the project, including a significant incident involving a product release.
3. Clarify the estimated tolls for the first five years of service of the facilities.

4. Confirm that shippers have been informed of the project and its effects on tolls. Also provide a summary of their concerns, if any, and the company's plans to address them.
5. Specify how the applicant will address funding for abandonment activities.

8.4.3. Guidance

The CER needs sufficient information to allow it and interested parties to understand the application and the impacts on third parties, and to make a decision. The information provided should demonstrate that the applied-for project is financially sound given the approved toll methodology and that it is not being cross-subsidized in an inappropriate manner.

While the CER would find the information identified in the filing requirements to be satisfactory in most instances, it may be necessary to provide further information. In general, more detailed information should be provided for projects that are greater in complexity and scope. Examples of factors that could affect the complexity and scope of a project include the:

- the size of the proposed facility tolls;
- proposed toll design methodology;
- level of market power held by the applicant, including its affiliates;
- number of shippers on the system;
- number of third parties that could be affected by the proposed facilities and the level of effect on these parties; and
- the financial risk assumed by the applicant.

Determine the level of information to include for each filing requirement based on the factors described above, and provide any additional information that would be pertinent.

Finance Information

Evidence that the applicant has the ability to finance the proposed facilities should include, but not be limited to:

- a description of the intended methods and sources of financing the proposed facilities;
- a description of any financing already in place; and
- a description of any restrictive provisions concerning future financing, any changes in capital structure, the impact on interest coverage ratios and other factors that could affect the financing of the proposed facilities.

Ownership Structure

The applicant should describe the corporate structure, including at a minimum:

a) The corporate structure chart showing the applicant, its subsidiaries, owning entities and affiliates; and
b) A description summarizing each entity’s ownership and the operating relationships with each other.

This chart in a) and the description in b) must show, but need not be restricted to:

i. the ownership of each entity and their jurisdiction of incorporation or registration; and,

Where limited partnerships are involved, a description of:

ii. the general and limited partners in each limited partnership; and
iii. the respective roles and responsibilities of each of these entities in managing the limited partnerships, and operating the pipeline and related facilities.

Financial Resources

The applicant must provide information on how it intends to support the management of potential costs associated with risks and liabilities during the construction and operation of the project, including a significant incident involving a product release. Any company authorized under the *Canadian Energy Regulator Act* to construct or operate a pipeline must maintain financial resources equal to its absolute liability limit or an amount greater than that required by the CER's Commission. The CER requires such companies to obtain approval of their financial resource plans. If this approval is sought as part of the proposed Designated Project Facility/Process/IA Study Authorization Application, etc., the applicant will be required to provide the information specified in the Pipeline Financial Obligations Guidelines. In any event, the information submitted as part of the Designated Project Application for Facilities Authorization/Process/IA Study, etc. should include:
A description of the applicant's expected absolute liability limit and evidence supporting the calculation of the absolute liability limit.

A description of the various types and amounts of financial resources provided by the applicant, including financial resources already available to the applicant. This description should:

- Detail the planned financial resources and amounts for each type;
- Explaining how financial resources will enable the applicant to respond to a release;
- Detail the expected or known terms and conditions of each planned financial resource or financial instrument (see Section 7.2 of the Pipeline Financial Obligations Guidelines for information);
- Present the time required for access to each planned financial resource;
- Demonstrate how the planned financial resources will enable the applicant to pay the applicable amount of absolute liability or an amount greater than that determined by the Commission or deemed adequate based on the analysis at point c. below;
- An analysis of the amount of financial resources within the absolute liability limit as sufficient or the appropriateness of providing an additional amount based on the potential cost of a hydrocarbon release. The analysis should consider the risk assessment for the proposed facilities and demonstrate the coverage of the costs of a spill by the financial resources required under the Canadian Energy Regulator Act or the Pipeline Financial Obligations Regulations. The costs of a release should take into account the identification of different categories of costs (e.g., cleanup and recovery versus compensation) and site-related variables that could influence the total costs.

For the meaning of “risk assessment” and “risk assessment results” see CSA Z662, Clause 3, and Annex B, Guidelines for Risk Assessment of Pipeline Systems.

Toll Details

Toll details will include:

- the tolls for the first five years of service;
- where tolls are based on cost, the cost of the service and rate base by major component;
- where tolls are not based on costs, the service delivery revenues and costs by primary component;
- the method and rates of depreciation by facility account;
- copies of all applicable rates, transportation contracts or operating agreements associated with the proposed facilities.

Information on funding for abandonment activities

In 2008, the National Energy Board (NEB) asked the following question: What is the optimal way to ensure that funds are available when costs are incurred for abandonment?

In its RH-2-2008 Reasons for Decision, the CER determined that abandonment costs are legitimate expenses related to the provision of services and can be recovered from users of the system, subject to its approval. It also stated that landowners will not be responsible for pipeline abandonment costs.

All pipeline companies regulated under the CERA must comply with the CER's and the Regulator's decisions on funding abandonment activities.

The applicant will require approval of the estimated abandonment costs for the proposed facilities, and a process and mechanism for setting aside the required funds. If this approval is sought as part of the proposed Designated Project Facility/Process/IA Study Authorization Application, etc., the applicant will be required to provide the information specified in the "Financing of abandonment activities" section of the NEB Filing Guide. In any event, abandonment funding information submitted as part of the Designated Project Application for Facility Authorization/Process/IA Study, etc. should include:

- The estimated abandonment costs proposed for the facilities, including a description of the methodology and assumptions used to estimate costs.
- A description of how the applicant plans to set aside the funds (a trust, letter of credit or surety bond) and a draft copy of the proposed set-aside mechanism.
- In the case of a trust,
    - a proposed trustee for the trust, and
    - a description of whether or not the trustee is governed by the Trust and Loan Companies Act;
- A description of how the funds will be collected.

8.5. Impacts of climate change commitments on economic and financial aspects

8.5.1. Goal

The application includes information indicating that the need for the proposed facilities and their economic viability, and the economic information provided, considers climate change commitments and prescribed climate change laws, regulations and policies to meet Canada's commitments.

8.5.2. Filing Requirements

Explain how climate change legislation, regulations and policies, financial risks and other uncertainties surrounding future commitments and changes have been incorporated into the economic analysis of the project.

8.5.3. Guidance

Describe how existing climate change legislation, regulations and policies have been considered in the assessment of the use of the proposed facilities and explain the potential and terms of economic feasibility can be influenced by financial risks and other uncertainties surrounding changes such as climate change legislation, regulations and policies.
Also describe how climate change laws, regulations and policies have been incorporated into relevant analyses and assumptions. Also include any laws, regulations and policies that have been drafted and tabled in the House at the provincial or federal level, but are not yet in force, can reasonably be expected to arrive at this point without speculation. Explain the supply and market implications of these laws, regulations and policies in any scenario analysis or risk assessment related to these factors (e.g., the proponent may consider conducting a supply and market sensitivity analysis based on various levels of carbon pricing). Describe the extent to which climate change commitments have been studied.
The depth of analysis should be commensurate with the nature of the project and potential impacts.

8.6. Non-CER Regulatory Facility Approvals

8.6.1. Goal

The application includes information on other regulatory processes that are being undertaken with respect to the project.

8.6.2. Filing Requirements

1. Confirm that all non-CER regulatory approvals required to allow the applicant to meet its construction schedule, planned in-service date and to allow the facilities to be used and useful are or will be in place.
2. If any of the approvals referred to in #1 may be delayed, describe the status of those approval(s) and provide an estimation of when the approval is anticipated.

8.6.3. Guidance

The CER requires information regarding the status of all required federal, provincial and municipal approvals or authorizations to be reasonably assured that there are no issues before other regulators that would prevent or delay either the construction or use of the applied-for facilities. Updates on status may also be provided after an application has been submitted.

9. Lands Information

9.1. Goal

The application includes accurate documentation on land areas, land rights, the service of notice, the land acquisition process, and includes sample agreements and notices

9.2. Filing Requirements – Land Areas

Ensure the land documentation includes the following:

- the width of the RoW including the locations where the width varies;
- the locations and dimensions of known temporary work space required for the project or, if locations are not known, a drawing showing the typical dimensions of the temporary work space required for road, watercourse and other crossings, storage areas and camps; and
- the locations and dimensions of any new lands required for all associated facilities.

9.2.1. Guidance – Land Areas

A description of the requirements and rationale for both temporary and permanent lands allows the CER to assess the appropriateness of the land areas. The description should include the dimensions of the:

- RoW;
- temporary working space;
- valve sites;
- cathodic beds;
- pole lines;
- access roads;
- meter stations; and
- facilities such as compressor or pumping stations.

Describe the location and distance of any changes to RoW width and the reasons for the change.

Where new lands under any type of agreement are not required for the project, this should be clearly stated in the application and no further land area information needs to be filed.

9.3. Filing Requirements – Land rights

- Provide a description of the type of land rights to be acquired for the project and associated facilities.
- Provide a description of the nature and relative proportions of land holdings along the proposed route (i.e., freehold, public or Crown land).
- Where no new land rights are required, provide a description of the existing land rights to allow the project to proceed.

9.3.1. Guidance – Land rights

The description of the type of land rights will allow the CER and landowners to know the different types of land required for the project (e.g., option, easement agreement, fee simple, compulsory right-of-way, temporary work area, licence, permit) and areas where existing land rights permit the project.

The description of the property characteristics allows the CER to know the land acquisition areas and the agreements necessary for carrying out the project.

9.3.2. Appropriate Dispute Resolution (ADR) mechanism

The CER encourages the parties affected by the projects it regulates to hold open and respectful exchanges to resolve issues that may arise throughout the project life cycle. The CER recognizes that there is a range of interest-based and responsive dispute resolution techniques that can be effective in addressing these issues and disagreements. Interest-based methods should be considered as an alternative or complement to regulatory or contested processes, such as the detailed route hearing, as soon as possible to achieve the best possible results.

The CER recommends that the parties add ADR to their project planning as soon as possible to resolve issues and manage conflicts: its ADR experts are available to help stakeholders define and design the dispute resolution process that best suits their unique needs, regardless of the stage of the project.

9.4. Filing requirements – Land acquisition process

- Provide a description of the land acquisition process that will be required for the project.
- Indicate the acquisition schedule and current status of the land acquisition process.
- Indicate the status of notices served, pursuant to subsection 322(1) of the *Canadian Energy Regulator Act*, to all owners of the lands to be acquired.

9.4.1. Guidance – Land acquisition process

A description of the land acquisition process to be implemented will allow the CER to assess the process and to be aware of the timing of acquisition.

The land acquisition information should describe the:

- numbers of landowners and tenants;
- numbers of option or easement agreements signed;
- numbers of notices served; and
- timing of service of remaining notices.

This information may be provided in a table form.

9.5. Filing requirements – Land acquisition agreements

1. Provide a sample copy of each form of land acquisition agreement proposed to be used (includes option and easement). The agreement shall be in the form required by subsection 321(2) of the CER Act;
2. Provide a sample copy of any proposed agreements for:
   - fee simple ownership;
   - temporary work space;
   - an access road; or
   - other agreements for the lands required for the project.

9.5.1. Guidance – Lands Acquisition Agreements

A sample copy of the acquisition agreement(s) enables the CER to verify that the agreement complies with the requirements of the CER Act and that landowner's rights are protected.

Where lands will not be acquired pursuant to the above filing requirements, it is not necessary to file the respective sample copy of agreement.

9.6. Filing Requirements – Section 322 Notices

1. Provide a sample copy of the notice proposed to be served on all owners of land pursuant to subsection 322(1) of the CER Act.

2. Confirm that all notices served or proposed to be served on owners of land pursuant to the requirements of subsection 322(1) of the CER Act include a copy of the CER publication titled: CER Landowner Guide.

9.6.1. Guidance – Section 322 Notices

Notice

Viewing a sample copy of the notice assists the CER in verifying that the notice complies with the requirements of subsection 322(1) of the CER Act and that landowners and others persons are adequately notified.

Lands not Acquired

In the event that a section 183 certificate is issued, the applicant would file the plans, profiles and books of reference (PPBoR) for the pipeline and serve notices pursuant to the requirements of subsection 201(1) of the CER Act on those landowners from which land rights have not been acquired. The CER may allow construction of the project for those portions where the lands have been acquired, with the exception of a buffer zone near the lands not yet acquired pending the applicant demonstrating to the CER that either the lands have been acquired, or the rights of the landowners have not been prejudiced.

CER Landowners' Guide

The CER's publication CER Landowner Guide is available on the CER's website and copies are available from the CER Library.

10. Filing requirements – Technical matters

10.1. Construction Safety Manual

1. Four weeks prior to the start of construction, the applicant must submit a Construction Safety Manual, in accordance with subsection 20(1) of the OPR-99 and subsection 27(1) of the PPR. Refer to section 1.6 if the manual has already been filed with the CER.

10.2. Emergency Procedures Manual

1. Six weeks prior to commissioning, the applicant must submit an Emergency Procedures Manual (and make it available online) and any updates to it, in accordance with subsection 32(2) of the OPR or subsection 35(b) and 35(c) of the PPR.
    - Any updates made to the manual to incorporate the project must be submitted.

11. Filing Requirements – Post Construction Environmental Monitoring Reports

In consideration with the Follow-up and Monitoring sections in the TISG Template (Section 26, Part 2), the following CER Act monitoring requirements must be taken into account:

1. Provide reference information including:
    - the CER order or certificate and condition number under which the report is being filed;
    - the year of reporting (e.g., 6 month, 1 year);
    - pipeline specifications (e.g., outside diameter of pipe, length of pipe, and product being transported); and

- a map of the region displaying the location of the pipeline as it was built in relation to provincial, territorial or national boundaries, and the nearest town.

2. Identify on a map, or with reference to a map, the locations of the following, as appropriate, in relation to the location of the pipeline as constructed:
   - sites requiring ongoing monitoring (e.g., steep slopes, erosion-affected areas, areas that have weed problems, specific wildlife habitat, trees, rare plant transplant and donor sites or riparian areas);
   - watercourse crossings, as well as any locations in which offsetting has been completed as required under a *Fisheries Act* Authorization. These locations are also to be provided in an electronic spreadsheet format and should include the name of the pipeline, name of the watercourse, type of watercourse, fish presence, the UTM location including zone in NAD83 datum and the crossing methodology implemented for each crossing;
   - wetlands;
   - access control features;
   - temporary work space boundaries and access roads;
   - planted tree bands;
   - areas of identified landowner concerns such as subsidence or soils issues; and
   - other project-specific sites of importance or interest.

3. Provide a discussion of the effectiveness of mitigation, reclamation, or compensation measures that were committed to and implemented. If measures were not successful, provide a description of what type of remedial measures were applied to accomplish the goals of mitigation or reclamation.

4. Identify the outstanding environmental issues, the plans for their resolution and any discussions held with interested parties regarding the issues.

5. Provide contact names and phone numbers of company representatives should there be questions from CER staff about the report or future inspections by CER staff that need to be arranged.

11.1. Report Content

These information requirements are intended to guide companies in developing post-construction environmental monitoring reports (post-construction report). Companies are encouraged to submit the listed information in an appropriate format such as:

- text;
- tables;
- diagrams; or
- photographs.

The initial post-construction report, also known as the as-built report, should be the most detailed post-construction report. The as-built report should focus on the issues from construction, and should be used as a building block upon which additional post-construction reports are based.

The subsequent post-construction reports should focus on the applied-measures and status of issues since the last post-construction report filing.

Photos can be used throughout the report to give the reader a better understanding of the issues, the state of the RoW, and the comparison between pre- and post-construction conditions.

The locations of specific environmental features and issues should be identified so that CER or company employees can easily locate areas on the ground. The locations may be marked on the map or may be identified in a list with reference to a map (e.g., alignment sheets). Locators such as latitude and longitude or Universal Transverse Mercator (UTM) coordinates should be used, and may be used in combination with kilometre- or mile-posts for use in flyovers.

The as-built report should discuss the mitigation implemented during construction and reclamation, and should include specific detail on unique or novel mitigation applied.

Subsequent post-construction reports should discuss measures implemented since the submission of the previous post-construction report and update the status of issues and the effectiveness of mitigation, as appropriate.

11.2. Biophysical and Socio-Economic Elements

Table AA-1 provides details on the information that may be reported for biophysical and socio-economic elements. To determine which biophysical elements need to be addressed, refer to Table A-1 in Section A.2 of Item A.
Highlight any new or innovative mitigation measures that have been used and provide an evaluation of their effectiveness.

12. Other Potential Information Requirements

The following activities related to the CER Act would not normally be required during the impact assessment process and therefore integrating this information into the Tailored Impact Statement Guidelines is not necessary. If the proponent requires information with respect to the following, please refer to the NEB Filing Manual.

9.1 Deviations
9.2 Change in Class Locations

9.3 Change of Service or Increase in Maximum Operating Pressure
9.4 Deactivation
9.5 Reactivation
9.6 Processing Plant: Deactivation and Reactivation
9.7 Commodity Pipeline Systems
9.8 Tolls and Tariffs
9.9 Designated Project Financial Surveillance Reports
9.10 Import and Export Reporting Regulation Requirements

13. Filing Manual Checklists

Filing manual checklists are available from the NEB Filing Manual.

14. Reference Documents – Part 3

Reference documents produced by the National Energy Board are available on its web site. These reference documents remain relevant to proponents with designated projects under the CER Act. Interim filing guidance related to the CER Act is also available.

- National Energy Board Act
- National Energy Board Filing Manual, 2017
- National Energy Board Rules of Practice and Procedure, 1995
- National Energy Board Onshore Pipeline Regulations
- National Energy Board Processing Plant Regulations
- National Energy Board Act Part VI (Oil and Gas) Regulations
- National Energy Board Substituted Service Regulations
- National Energy Board Export and Import Reporting Regulations
- National Energy Board Damage Prevention Regulations – Authorizations
- National Energy Board Cost Recovery Regulations
- Section 58 Streamlining Order XG/XO-100-2012, dated 1 August 2012 (Filing A43203)
- Order MO-002-2017 – Compelling Publication of Emergency Management Program Information on Company Websites (Filing A81701)
- Order MO-006-2016 – Compelling Publication of Emergency Procedures Manuals (Filing A79720)
- Order MO-CO-3-96 – Exemption of Commodity Pipelines from the OPR
- Guidelines for Negotiated Settlements of Traffic, Tolls and Tariffs, dated 12 June 2002
- National Energy Board Pre-Application Meetings Guidance Notes, dated 4 December 2008
- Electronic Filing – Memorandum of Guidance, dated 21 March 2002
- Filers Guide to Electronic Submission
- *Investigative Digs and Related Pipeline Repairs/Replacements*, dated 2 December 2002 (Filing A04591)

- *Security and Emergency Preparedness and Response Programs*, Appendix II to Guidance Notes for the National Energy Board Processing Plant Regulations, dated 24 April 2002
- *Upstream Jurisdictional Issues*, dated 17 September 1999
- *In the Matter of an Application under the National Energy Board Act of Review of Natural Gas Surplus Determination Procedures* (July 1987), No. GHR-1-87 (NEB) (Reason for Decision 1987-07-01)
- *In the Matter of an Application under the National Energy Board Act of Proposed Changes to the Application of the Market-Based Procedure* (May 1992), No. GHW-1-91 (NEB) (Filing A12128)
- NEB *Information for Proposed Pipeline or Power Line Projects that Do Not Involve a Hearing*
- NEB *Information for Proposed Pipeline of Power Line Projects that Involve a Hearing*
- NEB *Landowner Guide,* (previously Pipeline Regulations in Canada: A Guide for Landowners and the Public)
- *Pipeline Abandonment, A Discussion Paper on Technical and Environmental Issues*, dated November 1996
- *Canadian Environmental Assessment Act, 2012* (go to the web site at www.ceaa-acee.gc.ca for access to guidance documents)
- *Official Languages Act*
- Canadian Standards Association Standard Z662, *Oil and Gas Pipeline Systems*

Abandonment Funding and Planning

- May 2009, *Reasons for Decision RH-002-2008, Land Matter Consultation Initiative Stream 3 Pipeline Abandonment – Financial Issues* (Filing A21835, English A1J9R9) / français A1J9S0) Contains relevant principles, a preliminary Base Case and the 5-year Action Plan
- 4 March 2010, *Base Case Revisions Revisions to Preliminary Base Case Assumptions* (A24600, English A1S0C1 / français A1S0C2) Contains further detail on cost definitions and on collection periods and expected earnings on set-aside funds. Also contains details on filing formats
- 21 December 2010, *Unit Costs* A27778 (Letter: English A1W9T1 / français A1W9T2) (Amended Table A-3: English A1W9T3 / français A1W9T4) Contains estimates of individual cost components derived through discussions with industry
- 7 March 2011, Letter in response to CEPA (Filing A28440, English A1W9T1 / français A1Y0H4) The letter amended one deadline for Group 1 pipeline companies, to allow more time for consultation with landowners
- 1 June 2012, Letter to All Parties – RH-2-2008 Five Year Action Plan – Timelines for Remaining Steps (Filing A41955, English A2T8C7 / français A2T8C8)

- February 2013, *Reasons for Decision MH-001-2012, Applications filed in November 2011 for approval of preliminary cost estimates for abandonment cost funding* (Filing A50478, English A3F4F3 / français A3F4F4)
- 14 February 2013 Board Letter to Group 2 Companies on Abandonment Cost Estimates (Filing A50479, English A3F4F6 / français A3F4F7)
- May 2014, *Reasons for Decision MH-001-2013, Applications for approval of set-aside and collection mechanisms for abandonment cost funding,* (Filing A60676, English A3X4G5/ français A3X4G4) Contains Model Trust Agreement, Model Letter of Credit, and Model Surety Bond
- National Energy Board Decisions on Compliance with Reasons for Decision MH-001-2013 – Companies filing Trusts (Filing A64904)