Tailored Impact Statement Guidelines Template for Designated Projects Subject to the *Impact Assessment Act and the Nuclear Safety and Control Act*

Table of Contents

- Abbreviations and Short Forms
- Part 1 – The Tailored Impact Statement Guidelines Template
  - 1. Introduction
    - 1.1 Factors to be considered in the Impact Assessment
- Part 2 – Content – Tailored Impact Statement Guidelines Template
  - 1. Overview
    - 1.1 The proponent
    - 1.2 Project overview
    - 1.3 Project location
    - 1.4 Regulatory framework and the role of government
    - 1.5 Qualifications of individuals preparing the Impact Statement
  - 2. Project Description
    - 2.1 Project components
    - 2.2 Project activities
      - 2.1.1 Site preparation and construction
      - 2.2.2 Operation
      - 2.2.3 Abandonment or decommissioning
    - 2.3 Workforce requirements
  - 3. Project Purpose, Need and Alternatives Considered
    - 3.1 Purpose of the project
    - 3.2 Need for the project
    - 3.3 Alternatives to the project
    - 3.4 Alternative means of carrying out the project
  - 4. Description of Public Participation and Views
  - 5. Description of Engagement With Indigenous Groups
    - 5.1 Analysis of potentially affected Indigenous groups
    - 5.2 Record of engagement
    - 5.3 Analysis and response to questions, comments and issues raised
  - 6. Baseline Conditions
    - 6.1 Methodology
    - 6.2 Sources of baseline information
    - 6.3 Consideration and methodology in selecting VCs
    - 6.4 Spatial and temporal boundaries
  - 7. Baseline Conditions – Biophysical Environment
    - 7.1 Atmospheric, acoustic, and visual environment
    - 7.2 Meteorological Environment
    - 7.3 Geology, geochemistry and geological hazards
    - 7.4 Topography, soil and sediment
    - 7.5 Riparian and wetland environments
    - 7.6 Groundwater and surface water
    - 7.7 Marine environment and marine geohazards
    - 7.8 Vegetation
    - 7.9 Fish and fish habitat
    - 7.10 Birds, migratory birds and their habitat
    - 7.11 Terrestrial wildlife and their habitat
    - 7.12 Species at Risk
    - 7.13 Ambient Radioactivity
  - 8. Baseline Conditions – Human Health
  - 9. Baseline Conditions – Social
  - 10. Baseline Conditions – Economic
  - 11. Baseline Conditions - Indigenous Peoples
    - 11.1 Physical and Cultural Heritage
    - 11.2 Current Use of Lands and Resources for Traditional Purposes
    - 11.3 Health, social and economic conditions
    - 11.4 Conditions Related to the Rights of Indigenous Peoples
  - 12. Effects Assessment
    - 12.1 Methodology
    - 12.2 Interactions between effects and VCs
  - 13.Predicted Changes to the Physical Environment
    - 13.1 Changes to the atmospheric, acoustic, and visual environment
    - 13.2 Changes to groundwater and surface water
    - 13.3 Changes to riparian, wetland and terrestrial environments
    - 13.4 Changes to the marine environment
    - 13.5 Radiological conditions
    - 13.6 Electromagnetism and corona discharge
  - 14. Effects to Valued Components - Environment
    - 14.1 Fish and fish habitat
    - 14.2 Birds, migratory birds and their habitat
    - 14.3 Terrestrial wildlife and their habitat
    - 14.4 Species at risk
    - 14.5 Climate Change
  - 15. Effects to Valued Components – Human Health
  - 16. Effects to Valued Components – Social
    - 16.1 Services and infrastructure
    - 16.2 Land and resource use and recreation
    - 16.3 Navigation
    - 16.4 Community well-being
    - 16.5 Structure, site, things of historical, archaeological, paleontological or architectural significance
  - 17. Effects to Valued Components – Economic
  - 18. Effects to Indigenous Peoples
    - 18.1 Effects on Indigenous Peoples
    - 18.2 Impacts on rights of Indigenous peoples
  - 19. Mitigation and Enhancement Measures
  - 20. Residual Effects
  - 21. Cumulative Effects Assessment
  - 22. Other Effects to Consider
    - 22.1 Effects of potential accidents or malfunctions
    - 22.2 Effects of the environment on the project
  - 23. Canada's Ability to Meet Its Environmental Obligations and Its Climate Change Commitments
  - 24. Description of the Project's Contributions to Sustainability
  - 25. Follow-up Programs
    - 25.1 Follow-up program framework
    - 25.2 Follow-up program monitoring
  - 26. Assessment Summary
- Part 3 – Licensing Requirements of the Canadian Nuclear Safety Commission
- Appendix 1 – Resources and Guidance

Abbreviations and Short Forms

Agency
: Impact Assessment Agency of Canada

BCRs
: Bird Conservation Regions

CAAQS
: Canadian Ambient Air Quality Standards

CNSC
: Canadian Nuclear Safety Commission

COSEWIC
: Committee on the Status of Endangered Wildlife in Canada

ECCC
: Environment and Climate Change Canada

FA
: Federal Authority

GBA+
: Gender Based Analysis Plus

GHG
: Greenhouse gas

HIA
: Health Impact Assessment

IA
: Impact Assessment

IAA
: Impact Assessment Act

Minister
: Minister of Environment and Climate Change

NOC
: National Occupational Classification

NSCA
: Nuclear Safety and Control Act

Registry
: Canadian Impact Assessment Registry

SARA
: Species at Risk Act

TIS Guidelines
: Tailored Impact Statement Guidelines

TISG Template
: Tailored Impact Statement Guidelines Template

VC
: Valued component (including environmental, health, social, economic and potentially other elements of the natural and human environment)

Part 1 – The Tailored Impact Statement Guidelines Template

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, as opposed to the previous environmental assessment process, where decisions were based on whether a project is likely to cause significant adverse environmental effects. The public interest determination is guided by the factors set out in the Impact Assessment Act (IAA):

- 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 peoples and their rights[Footnote 1]; and
- potential impacts on Canada's ability to meet its environmental obligations and its climate change commitments.

A key element for the IA process is the introduction of Tailored Impact Statement Guidelines[Footnote 2] (TIS Guidelines), which provide direction to the proponent on the factors to be considered, the methodology to be followed and information requirements, in order to guide preparation of the Impact Statement. The TIS Guidelines are developed by the Agency and provided to the proponent early in the IA process and are tailored for the specific designated project. The development of the TIS Guidelines will be informed by consultation and engagement that occurs with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities (FAs) and other interested parties.

The Tailored Impact Statement Guidelines Template (TISG Template), described in Part 2 of this document, is the starting point for process to develop the TIS Guidelines. The TISG Template sets out a comprehensive list of potential requirements that, through the tailoring process, will be reviewed to identify the project-specific requirements for a complete and detailed Impact Statement, which will then be set out in the TIS Guidelines provided to the proponent. The TIS Guidelines may also contain requirements that are not included in the Template, but are identified during the early planning process.

Under the IAA, designated projects that are also regulated by the Canadian Nuclear Safety Commission (CNSC) will be assessed by an integrated review panel process. For these projects, the TIS Guidelines will be developed by the Agency in coordination with CNSC and will identify information requirements under both the IAA and the *Nuclear Safety and Control Act* (NSCA). Part 3 sets out these additional NSCA requirements that are not directly linked to impact assessment. The requirements provided for in Part 3 will not be tailored in the same manner as the requirements set out in Part 2. The priority will be to avoid any overlap or duplication between the IAA and NSCA requirements. The information necessary to make NSCA decisions may be informed by the IA process, but would not be necessary for decisions under the IAA.

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 identifies 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 Impact Assessment (IA). These factors are listed in subsection 22(1) of the *Impact Assessment Act* (IAA) and prescribe that the IA of a designated project must take into account:

- 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:
  - the effects of malfunctions or accidents that may occur in connection with the designated project;
  - 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
  - the result of any interaction between those effects.
- mitigation measures that are technically and economically feasible and that would mitigate any adverse effects of the designated project;
- 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;
- the purpose of and need for the designated project;
- 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;
- any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;
- Indigenous knowledge provided with respect to the designated project;
- the extent to which the designated project contributes to sustainability;
- 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;
- any change to the designated project that may be caused by the environment;
- the requirements of the follow-up program in respect of the designated project;
- considerations related to Indigenous cultures with respect to the designated project;
- community knowledge provided with respect to the designated project;
- comments received from the public;
- comments from a jurisdiction that are received in the course of consultations conducted under section 21 of the IAA;
- any relevant assessment referred to in sections 92, 93 or 95 of the IAA;
- 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;
- 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 IAA — that is in respect of a region related to the designated project and that has been provided with respect to the project;
- the intersection of sex and gender with other identity factors;
- 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 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, in consultation with the CNSC, and will be outlined in the TIS Guidelines.

Pursuant to section 24 of the NSCA, the integrated IA will also need to include consideration of:

- whether the applicant is qualified to perform the activity to be licensed; and
- whether in carrying on that activity the applicant will make adequate provisions for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Proponents should also refer to CNSC's REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* and other relevant CNSC regulatory documents (see Part 3) for further information on licensing requirements and guidance.

With respect to the protection of the environment and human health, CNSC requires that proponents demonstrate through their license application that their environmental protection measures:

- are commensurate with the level of risk associated with the activity
- recognize that uncertainty exists in science and account for this uncertainty:
  - by keeping all releases to the environment as low as reasonably achievable (ALARA), social and economic factors being taken into account for nuclear substances
  - through the application of the best available technology and techniques economically achievable (BATEA) for hazardous substances
- respect the precautionary principle, the "polluter pays" principle, and the concepts of pollution prevention, sustainable development and adaptive management
- are assessed against performance indicators and targets that are based on sound science

Further details on CNSC's licensing requirements are identified in Part 3 of this document.

The information provided by the proponent is to be provided in machine-readable, accessible format. This would support of 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. 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 Template

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 in the Impact Statement (IS). Proponents should present the information in a manner that works for their specific-project.

1. Overview

1.1 The proponent

The Impact Statement must:

- provide contact information for 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 corporate structure;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the Impact Statement and conducting the Impact Assessment.

1.2 Project overview

The Impact Statement must describe the designated project, key project components and ancillary activities, scheduling details, the timing of each phase of the project and other key features. If the project is part of a larger sequence of projects, the Impact Statement must outline the larger context.

1.3 Project location

The Impact Statement must describe the geographical setting and socio-ecological context in which the project is to take place. The description should focus on aspects of the project and its setting 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 map(s):

- geographic coordinates (i.e. longitude/latitude using international standard representation in degrees, minutes, seconds) for the centre of the main project site;
- 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 and their location on a map;
- navigable waterways;
- 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, marine protected areas, marine refuges, 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; and
- culturally important features of the landscape.

Maps are to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard.

Consult the Guidance on submitting geospatial data for more information.

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* (IAA) that has powers, duties or functions in relation to the environmental effects of a project;
- 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 IA;
- any relevant land use plans, land zoning or community plans;
- information on land lease agreement or land tenure, when applicable; and
- 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.

1.5 Qualifications of individuals preparing the Impact Statement

In support of ensuring transparency and the quality of the scientific information and analysis being applied, the proponent must provide information on the individuals who prepared the sections within the Impact Statement related to environmental, economic, social, and health impacts and 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 on by the proponent to provide advice within his or her 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 describing 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, properties or leased lands, adjacent resource lease boundaries, adjacent land uses and any important environmental features.

A list of key project components must be prepared during the IA Planning Phase and is informed by the Detailed Project Description.

2.2 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 rights of Indigenous peoples. Sufficient information must be included to adequately predict adverse and positive environmental, health, social and economic 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 VCs.

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

The final list of key project activities must be completed during the planning phase of the IA, and is informed by the Detailed Project Description to be submitted by the proponent. 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. Project activities, where relevant to the project, may include, but are not limited to a description of the elements listed below:

2.2.1 Site preparation and construction

- construction staging;
- site grading/grubbing/clearing and excavation, including tree and vegetation removal;
- drilling and blasting/dredging (frequency, duration, time of year, time of day and methods);
- explosives manufacture, storage and management;
- construction of site access roads and linkages to public roadways;
- installation of towers and transmission lines;
- installation of site services such as fencing, lighting and security systems;
- changes to existing infrastructure (e.g. relocation of pipelines);
- borrow materials requirement (source and quantity);
- storage areas for material stockpiles (e.g., topsoil, overburden, waste rock);
- water management, including water crossings and diversions, dewatering or deposition activities, stormwater management required (location, methods, timing);
- sewage treatment and waste management systems;
- operation of light duty, heavy-duty and mobile off-road equipment (type, quantity);
- construction of temporary and on-site support facilities (e.g., administrative, warehouses) and other ancillary facilities;
- establishment of worker accommodations (capacity, wastewater treatment);
- transportation of employees and materials;
- storage and management of industrial, domestic and hazardous materials, fuels and residues;
- construction of mine shafts, underground/open pit mine development;
- construction of storage areas for the management of site preparation and construction waste; and
- construction and operation of any waste management systems.

2.2.2 Operation

- product production and stockpiling, product extraction, processing and treatment;
- drilling and blasting, explosives manufacture, storage and use;
- operation and maintenance activities such as verification of equipment and systems;
- water management, including potable water, water use requirements, storm water, process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release point(s);
- storage, handling, transport and disposal of industrial, domestic, hazardous materials and contaminated waste;
- dredging and maintenance dredging;
- operational monitoring programs;
- waste management, optimization and recycling;
- workforce management, including transportation, work schedules and lodging;
- mining of the ore deposit and operation of surface infrastructure and support facilities;
- mine waste management including tailings, waste rock, ore, overburden and topsoil;
- transport of ore and mine waste;
- site reclamation activities;
- fuelling and refuelling of a nuclear reactor;
- management of radioactive waste and used fuel, including transfer to waste management facilities; and
- at the end of operational activities, removal of fuel from a nuclear reactor and draining and drying of a nuclear reactor.

2.2.3 Abandonment or decommissioning

- the preliminary outline of a suspension, abandonment, decommissioning or reclamation plan for any components associated with the project;
- the ownership, transfer and control of the different project components;
- final site restoration;
- reclamation, recontouring and revegetating of the site;
- removal of surface contamination from facilities and equipment;
- dismantling and removal of equipment and systems;
- demolition of buildings and ancillary structures;
- long term care, monitoring and maintaining the integrity of the site and any remaining structures;
- transfer of used fuel and radioactive waste to storage facilities;
- management and disposal of conventional, radioactive and other hazardous waste arising from decommissioning; and
- suspension, abandonment or decommissioning for temporary or permanent facilities.

2.3 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;
- 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; and
- workplace policies and programs including codes of conduct, workplace safety programs and cultural training programs.

3. Project Purpose, Need and Alternatives Considered

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. electricity supply, mineral extraction/processing, etc.) and indicate the target market (e.g. international, domestic, local, etc.), where applicable. 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 groups, governments) in establishing objectives that relate to the intended effect of the project on society.

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 (e.g. the output of an operation does not excessively exceed the projected demand). The proponent may report the comments or views of Indigenous peoples, the public and other participants on the proponent's need statement.

3.3 Alternatives to the project

In addressing alternatives to the designated project, the Impact Statement must provide a description of the functionally different ways that are technically and economically feasible to meet the 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.

There can be reviews where the scope of alternatives to the project are limited. For example, in the case of a nuclear energy project, an assessment of energy mandates established through federal and provincial legislation/policy may not be within the scope of the IA - the alternatives to the project need not include alternatives that are contrary or not consistent with federally mandated initiatives and/or a province's formal plans or directives. However, the proponent should explain where this rationale has been applied to exclude consideration of possible alternatives to the project.

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 IAA.

3.4 Alternative means of carrying out the project

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 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; and
- those alternative means that are technically and economically feasible.

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 the Indigenous group(s). The application of Gender Based Analysis Plus (GBA+)[Footnote 3] to the effects analysis to describe disproportionate effects for diverse subgroups is required. The proponent must also consider the views or information provided by Indigenous people, 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 determine the preferred alternative means and the unacceptability of excluded alternative means, including consideration of trade-offs associated with the preferred and alternative means; and
- criteria to examine the environmental, health, social and economic effects of each remaining alternative means to identify a preferred alternative.

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

- project site location;
- access to the project site;
- location of key project components;
- facility layout and design;
- switchyard design;
- nuclear reactor design technologies:
- water cooling technologies and systems for nuclear generating sites, including intake and discharge structures);
- waste management strategies for radioactive waste and used fuel;
- energy sources to power the project site and other stationary sources to provide heat or steam to the project;
- management of water supply and wastewater;
- water management and location of the final effluent discharge points;
- construction alternatives;
- timing options for various components and phases of the project;
- suspension, abandonment or decommissioning options; and
- mining related activities:
  - mining operations (open pit, underground);
  - processing facilities location and design (communition, separation, concentration and dewatering; and
  - for mine waste management facilities (tailings, waste rock, overburden, low-grade ore, effluent), an assessment of alternatives report must be prepared and submitted. The assessment must be conducted in such a way that it clearly demonstrates that the chosen location is the most appropriate option for mine waste disposal from environmental, technical, economic, social and health perspectives. The assessment of alternatives report shall include the following steps with all supporting documents and/or references:
    1. Identification of candidate alternatives (including threshold criteria)
    2. Pre-screening assessment
    3. Alternatives characterization (including environmental, technical, economical and social considerations)
    4. Multiple accounts ledger (including the determination and evaluation of impacts generated by each option)
    5. Value-based decision process
    6. Sensitivity analysis

As relevant, the alternatives to and alternative means assessments should be informed by, but not limited to, the following:

- any regional or strategic assessment;
- any study or plan that is conducted or prepared by a jurisdiction – or an Indigenous governing body – in respect to the region related to the designated project and that has been provided with respect to 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.

The proponent should refer to any current Agency guidance on this topic.

4. Description of Public Participation and Views

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. The Impact Statement must provide a summary of key issues related to the project that were raised through engagement with the public and the potential environmental, health, social and economic effects, including disproportionate effects, for diverse subgroups within the population. The Impact Statement must describe any outstanding issues raised by the public and ways to address them, such as alternatives means, specific mitigation measures or specific monitoring and follow-up programs to deal with 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.

5. Description of Engagement With Indigenous Groups

During the IA Planning Phase and in conjunction with the tailoring process, the proponent must meaningfully engage with Indigenous groups that may be affected by the project.

5.1 Analysis of potentially affected Indigenous groups

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

- the list of Indigenous groups potentially impacted by the project;
- the source of information and analysis used in creating the list of potentially impacted Indigenous groups;
- a list of potential effects and impacts to environmental, health, social and economic conditions of each Indigenous group and the predicted degree (e.g. high, moderate, low) of those effects and impacts;
- the Indigenous rights of each Indigenous group, 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 group.

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 group 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 groups engaged by the proponent, including those which the proponent was unsuccessful in engaging;
- the engagement activities undertaken with each Indigenous group, including the date, means and results of engagement;
- a description of efforts to engage diverse populations of each Indigenous community 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 groups 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 group(s).

5.3 Analysis and response to questions, comments and issues raised

The Impact Statement must provide an analysis of the input received from Indigenous groups with respect to the designated project. This analysis is to include all input received by Indigenous groups 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 the identification of specific VCs where appropriate.

The analysis in the Impact Statement must also include consideration of Indigenous knowledge provided by Indigenous groups. 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 groups 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 groups, 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 specific project components or activities. The analysis and responses are to include:

- main issues, questions and comments raised during the engagement activities by each Indigenous group 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 groups' perspectives and input were integrated into or contributed to decisions regarding the designated project (e.g. project design), including:
  - scoping, development and collection of baseline information;
  - plans for construction, operation, decommissioning, abandonment and maintenance; and
  - follow-up and monitoring.
- where and how Indigenous groups' 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 group;
- where and how Indigenous groups' perspectives and Indigenous knowledge and input were integrated in avoiding, mitigating or accommodating identified effects and impacts; and
- where potential impacts on Indigenous rights are identified, provide a description of how each potential impact would be avoided, managed, mitigated or accommodated (and provide this information for each Indigenous group separately).

The proponent should refer to Agency guidance on this topic.

6. Baseline Conditions

6.1 Methodology

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. Meaningful, two-way dialogue with communities and Indigenous groups 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. Both qualitative and quantitative data may be necessary to describe baseline conditions across diverse subgroups.

There is no need for the Impact Statement to provide detailed descriptions of existing features of environmental, health, social or economic components that would not be impacted by the project as determined by the Agency through engagements with FAs, lifecycle regulators, Indigenous groups, the public and interested parties.

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, identified during early planning and reflected in the TISG. 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; hydrogeological or oceanographic patterns; nutrient cycling; abiotic-biotic and biotic interactions; population dynamics, 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. 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 most sensitive receptors;
- species habitat areas, 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 groups;
- areas of known Indigenous land, cultural, spiritual and resource use; and
- existing affected infrastructure.

6.2 Sources of baseline information

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

- field studies, including site-specific survey methods;
- database searches, including federal, provincial, territorial, municipal and local data banks;
- 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);
- remote sensing information;
- published literature;
- 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;
- baseline human health risk assessments;
- community and regional economic profiles; and
- statistical surveys, as applicable.

The Impact Statement must provide detailed descriptions of specific 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.

6.3 Consideration and methodology in selecting VCs

The list of VCs must be finalized during the IA Planning Phase and will be informed through engagement with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities (FAs), and other interested parties. The Impact Statement must describe VCs, processes, and interactions that are identified to be of concern or that the Agency considers likely to be affected by the designated project and has included in the TIS Guidelines.

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, cultural, spiritual historical, health, social, economic, recreational, aesthetic considerations, and Indigenous 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 IA 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 under stress from other past, existing or future undertakings in combination with other human activities and natural processes;
- the extent to which the VC is linked to Indigenous interests or rights of Indigenous peoples and whether an Indigenous group has requested the VC;
- the extent to which the VC is linked to a federal, provincial, territorial or municipal government priorities;
- information from any ongoing or completed regional assessment processes;
- the possibility that an adverse or positive effect on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and
- 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.

6.4 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 spatial and temporal boundaries to be used in the IA are outlined and discussed through the tailoring process, and include comments and input from federal and provincial government departments and agencies, lifecycle regulators, local government, Indigenous groups, the public and other interested parties.

The Impact Statement must 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. Spatial boundaries are defined taking into account the appropriate scale and spatial extent of potential effects and impacts of the project; community knowledge and Indigenous 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. It should be noted that in some cases, spatial boundaries may extend to areas outside of Canada. These transboundary spatial boundaries should be identified where transboundary effects are expected.

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.

7. Baseline Conditions – Biophysical Environment

Through the tailoring process for the development of TIS Guidelines, the Agency may determine that there is no need for the Impact Statement to provide detailed descriptions of existing baseline features that would clearly not be impacted by project construction, operation, maintenance, suspension, abandonment or decommissioning.

The following, therefore, is a list of elements, within the existing biophysical environmental setting for all designated projects that could be identified as VCs and which would require a detailed baseline description in the Impact Statement. This list and corresponding requirements will be refined based on engagement, consultations and analyses conducted as part of the planning process. The same approach will apply to other VC categories.

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. GIS Data Supply Guidelines are currently under development.

Consult the Guidance on submitting geospatial data for more information.

7.1 Atmospheric, acoustic, and visual environment

The Impact Statement must:

- provide the results of a baseline survey of ambient air quality by identifying and quantifying emission sources for the following contaminants: total suspended particulates, fine particulates smaller than 2.5 microns (PM2.5), respirable particulates of less than 10 microns (PM10), carbon monoxide (CO), ozone, sulphur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), hydrogen sulphide (H_2S), and any other toxic air pollutants (mobile and stationary sources);
- address seasonal variability in the baseline survey and include a determination of background or ambient contaminant concentrations with monitoring data of appropriate duration, representativeness, data completeness, data validation and quality control;
- provide dispersion modelling of a base case to account for existing pollutant sources and to determine the spatial distribution of pollutants within the study area;
- describe existing radon gas conditions;
- describe all direct and indirect sources of baseline air emissions, including mobile, stationary and fugitive;
- provide 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 sound levels for each receptor. Information on typical sound sources, geographic extent and temporal variations will be included;
- provide information on all noise-sensitive receptors in the study area, including any foreseeable future receptors, and distances of receptors from the project;
- for the aquatic environment, provide current underwater soundscape and vibration descriptions of the study area and at the project site from various sources based on acoustic measurements. Provide information on vibration and sound sources, geographic extent and spatial and temporal variations within the water column and at the seafloor; and
- describe 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 Impact Statement will describe night-time illumination levels during different weather conditions and seasons.

Guidance from Health Canada regarding baseline information collection is identified in Appendix 1.

7.2 Meteorological Environment

The Impact Statement must:

- 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;
- provide hourly meteorological data (wind speed and direction, air temperature, net radiation, turbulence and precipitation data) from a minimum of one year to support dispersion modelling that captures the normal variability of meteorological conditions; and
- provide pan evaporation measurements or estimates of monthly (or daily) evapotranspiration.

7.3 Geology, geochemistry and geological hazards

The Impact Statement must:

- describe the bedrock and host rock geology, including a table of geologic descriptions, including alteration styles, geological maps and cross-sections of appropriate scale;
- describe the geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components, including the presence and distribution of permafrost, if applicable;
- identify any areas with potential for acid-generating rock and predict metal leaching and acid rock drainage including oxidation of primary sulphides and secondary soluble sulphate minerals;
- 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;
  - history of landslides, slope erosion and the potential for ground and rock instability/landslides, and subsidence during and following project activities;
  - history of landslide-generated tsunamis if near a shoreline;
  - history or and potential of submarine landslides; and
  - history and potential of volcanic related hazards.
- provide a characterization of the geochemical composition of expected mined materials such as waste rock, ore, low grade ore, tailings, overburden and potential construction material, which should include: ore mineralogy, major and trace elements, and potential for acid generation, neutralization and contaminated neutral drainage;
- describe baseline concentrations of contaminants of concern (these may include but are not limited to selenium, sulphate, cadmium, nitrate and calcite, heavy metals) within the local, regional and downstream receiving environments; and
- provide a geochemical characterization of leaching potential.

7.4 Topography, soil and sediment

The Impact Statement must:

- describe the landforms, soils and sediments within the local and regional project areas, 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 project site area to support soil salvage and reclamation efforts, and to outline 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; and
  - 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; and
- identify ecosystems that are sensitive or vulnerable to acidification resulting from the deposition of atmospheric contaminants.

For projects within the permafrost regions:

- describe permafrost conditions including distribution of frozen and unfrozen ground, thermal conditions (ground temperatures), ground ice, thaw sensitivity and active layer thickness;
- describe the interactions between permafrost, surface water and groundwater, and topography, as well as rock fractures and talik zones between different surface-groundwaters; and
- describe the potential for thaw settlement and terrain instability associated with ground thawing in permafrost areas.

7.5 Riparian and wetland environments

The Impact Statement 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; and
  - current level of disturbance.
- provide data files of mapped features depicting natural areas and wildlife presence within, and use of, the study area;
- identify wetlands potentially directly or indirectly affected by the project and within the scope of federal permits, authorizations, or other approvals;
- determine whether these wetlands are within a geographic area of Canada where wetland loss or degradation has reached critical levels, or 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 Appendix 1); and
- identify a regional study area of sufficient size to capture effects to wetlands within the larger drainage area and include wetlands located outside of the local study area that may be affected by hydrological changes as a result of cumulative effects.

7.6 Groundwater and surface water

Requirements for the characterization of baseline groundwater and surface water 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 complete hydrometeorological (temperature, precipitation, evapotranspiration) information based on data from nearby weather stations or from a weather station on site;
- provide the delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and sub-watersheds, in relation to key project components;
- provide flow hydrographs for nearby streams and rivers showing the full range of seasonal and inter-annual variations; They may be based on data from nearby gauging stations or from gauging stations on site;
- provide stage hydrographs for nearby lakes showing the full range of seasonal and inter-annual water level variations;
- provide the timing of freeze/thaw cycles, ice cover, and ice conditions for surface water bodies in the project area;
- provide for each water body potentially affected by the project, the total surface area, 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, discharge and recharge areas;
- In northern regions, describe permafrost conditions and taliks and their influence on groundwater–surface water interactions;
- develop a quantitative surface water balance for the local or regional watershed(s) containing the project;
- 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 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) and relevant chemical constituents (major and minor ions, trace metals, radionuclides, nutrients, and organic compounds, including those of potential concern); the data should illustrate the seasonal and inter-annual variability in baseline surface water quality, including possible changes due to groundwater–surface water interactions;
- identify all domestic, communal, or municipal water wells within the local and regional project areas, including their screened hydrostratigraphic unit and 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, completion

details (diameter, screen depth), geological log, screened hydrostratigraphic unit, piezometric level, and monitoring frequency;
- 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); the data should 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 both bedrock and overburden;
- 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.

7.7 Marine environment and marine geohazards

The Impact Statement must:

- describe seasonal marine water quality (e.g. water temperature, turbidity, hydrocarbons, total suspended solids, salinity and pH);
- provide a description of marine geology, geomorphology and geohazards including:
  - bottom sediment type, competence, thickness, grain size; and
  - ice scours, gas-charged sediments, gas hydrates, sediment diapirs, fluid escape features, in northern areas the presence of subsea permafrost, permafrost and melting hazards, sediment mobility, sediment overpressures and loading, faults and their movement, erosion past and present and its potential as a hazard, and geo-biological hazards like bioherms.
- describe the historical marine use and the potential for contamination of sediments and describe any known or suspected sediment contamination within the study area that could be re-suspended, released or otherwise disturbed as a result of the project;
- provide a description of the physical oceanography within the study area including surface and subsurface current patterns, current velocities, waves, storm surges, longshore drift processes, tidal patterns, and tide levels for the site, in proximity to the site, and along the marine shipping routes with consideration of predicted climate change effects;
- describe coastal processes, including zones of erosion and deposition;
- provide bathymetric information for the study area and along marine shipping routes if applicable;
- describe sea ice climate in the regional and local study area, including ice formation and thickness, ridging, breakup and movement;
- describe sea ice conditions along the marine shipping routes with consideration of predicted climate change and its possible effect on the timing and frequency of iceberg and/or ice island encounters or timing of sea ice formation in the future;
- provide a description of fast-ice characteristics, including its surface area and seasonal stability at the site of any designated project and/or port and along marine shipping routes; and
- provide a characterization and mapping of sensitive shorelines in all areas that may be of risk of shoreline oiling resulting from a potential accident or malfunction.

7.8 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, forestry, tame pasture, native prairie, wetland or old growth);
  - the conservation status (i.e. listed under the Species at Risk Act (SARA) or assessed by the Committee on the Status of Endangered Wildlife in Canada (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;
  - 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;
- describe any weed species, other invasive species, and introduced species of concern;
- describe the natural disturbance regime (e.g. fire, floods, droughts, etc.); and
- describe the use of local vegetation as a source of country foods (traditional foods) and whether its consumption has any Indigenous cultural importance.

7.9 Fish and fish habitat

The Impact Statement must:

- provide a characterization of fish (as defined in subsection 2(1) of the Fisheries Act) and other aquatic species on the basis of resident and migratory species, food webs and trophic levels, structural and functional linkages, life history and population dynamics, such as dispersion, fertility, recruitment, mortality rates, re-colonization, age structure, sex ratios, population regulation, stability, distribution (communities, stocks, subpopulations, metapopulations), movements, migratory patterns, routes and preferred corridor, seasonal and annual trends in abundance, sensitive habitats and periods in relation to the study area, behavioural habitat selection, mating strategies, social interactions, predator-prey interactions at multiple spatial and temporal scales, which are critical to identifying effects to population persistence and ecological processes;
- provide a description of the biodiversity within the freshwater and marine environment, including: trophic state, periphyton, phytoplankton, zooplankton, fish and the interactions and relative significance of each species with the identified food chains;
- identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline biodiversity for fish and marine animals, including the rationale for their selection;
- provide information on the surveys carried out and the source of data available (e.g. location of sampling stations, catch methods, date of catches, species, catch-per-unit effort);
- describe primary and secondary productivity in affected water bodies with a characterization of biotic interaction processes (e.g. food web and trophic levels, nutrient cycling), season variability, ranges and sensitive periods;
- list any aquatic species at risk, including critical habitat, that are known to be present within the study area;
- provide a description and location of critical habitats for aquatic species at risk that are known to be present within the study area;
- describe habitat by mesohabitat (e.g. pool, riffle, run), including the length of the section, width of the channel from the high water mark (bankfull width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos;
- identify natural obstacles (e.g. falls, beaver dams) or existing structures (e.g. water crossings) that hinder the free passage of fish;
- provide a characterization of fish habitat features that may demonstrate the presence of fish species in terms of appropriate habitats—water quality and quantity characteristics, sediment type characteristics, seafloor terrain features, prey, shelter, refuge, feeding, spawning habitats, nursery habitats, rearing habitats, overwintering, migration routes and the sensitive times for these activities;
- provide a description of habitat information that includes water depths (bathymetry) and the littoral, sublittoral, bathyal, epipelagic, mesopelagic, bathypelagic zones;
- describe the use of fish and/or aquatic species as country foods, and whether its consumption has Indigenous cultural importance;
- provide a list of marine mammal species that may be present, the times of year they are present, the ranges of the species, their habitat and their migration patterns;
- describe the use of fish as a source of country foods (traditional foods) and whether its consumption has Indigenous cultural importance;
- describe any existing, designated or proposed special marine areas such as: marine refuges, marine conservation areas, species at risk critical habitat, ecological reserves and marine protected areas, in proximity to the project location or that could be affected by routine project operations; and
- identify sensitive habitat areas (e.g. Ecologically and Biologically Sensitive Marine Areas) within the study area and along the shipping route.

Certain intermittent and ephemeral watercourses or waterbodies may constitute fish habitat or contribute indirectly to fish habitat during a certain period. 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).

7.10 Birds, migratory birds and their habitat

The Impact Statement 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) and BCR strategies. Possible information sources include, but are not limited to: wildlife experts/naturalists, Canadian Conservation Data Centres, BCR strategies, E-Bird, Breeding Bird Atlases, Environment and Climate Change Canada's guidance on Bird Surveys (see Appendix 1);
- identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline avifauna biodiversity and discuss the rationale for their selection;
- provide estimates of the abundance and distribution, 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;
- identify areas of concentration of migratory birds, including sites used for migration, staging, breeding, feeding and resting;
- describe food webs and trophic linkages to summarize biotic interactions;
- 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 information (e.g. land cover types, vegetation, marine elements), including habitat fragmentation;
- provide an estimate of year-round bird use of the area (e.g. winter, spring migration, breeding season, fall migration), based on data from existing sources and surveys to provide current field data if required to generate reliable estimates;
- describe the use of (magnitude, timing) migratory and non-migratory birds as a source of country foods (traditional foods) and whether consumption has Indigenous cultural importance; and
- 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 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 based on a thorough review of the available scientific literature pertinent to the specific region, bird groups and anticipated effects. The Canadian Wildlife Service's *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 Appendix 1).

7.11 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 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).
- 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, biotic and abiotic indicators that are used to characterize the baseline biodiversity for terrestrial wildlife and discuss 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 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 Natural World Heritage Sites;
- identify wildlife management areas and established or proposed sanctuaries; and
- describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use.

7.12 Species at Risk

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 designated project. 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;
- provide a list of all provincially listed protected species at risk and 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 designated project. Use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal 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;
  - data must be supplemented by surveys, as required;
  - survey protocols should optimize detectability and survey effort should provide for comprehensive coverage at the appropriate time of year (e.g. survey breeding habitat during breeding season, stopover habitat during migration);
  - survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation; and
  - where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the development of the baseline surveys (e.g. federal/provincial wildlife experts, specialists and local Indigenous groups).
- 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 history of species at risk (e.g. breeding, foraging) that may occur in the project area, or be affected by the project.

COSEWIC provides an annual report listing the designated wildlife species on its website (see Appendix 1).

7.13 Ambient Radioactivity

For designated projects or project-related physical activities that potentially could change the radiological conditions within the study area, the Impact Statement must:

- describe the ambient radiological conditions at the project site and within the local and regional study areas. The Impact Statement must provide information on existing conditions including an inventory of sources, activity levels and origin for all environmental components including air, soil, food, water, aquatic sediments, plant and animal tissue;
- describe human and non-human biota exposed to ambient radioactivity, including information on radiation levels to which workers and members of the public are exposed;
- describe country food exposure pathways, taking into account cultural norms and traditional activities of Indigenous peoples; and
- describe current radiological monitoring, management programs and any special studies, including detailed results from these programs.

Guidance on radiological baseline information requirements is provided in Appendix 1.

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 social determinants of health approach recognizes that health is more than the absence of disease but includes broad factors that support well-being. The scope and content of the human health baseline will reflect the specific project context, taking into account input of public and Indigenous groups, and should include indicators that are meaningful for the effects analysis. The information provided must:

- be sufficient to provide a comprehensive understanding of the state of human health, including potentially impacted Indigenous groups;
- describe how community and Indigenous knowledge from relevant populations was used in establishing health baseline conditions, including input from diverse subgroups; and
- describe baseline health conditions for diverse 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 affected directly and indirectly by the project, should be provided in association with a consideration of those in the community who are considered particularly vulnerable to changes brought about by the project.

As applicable, the baseline information must be sufficiently disaggregated and analysed to support the analysis of disproportionate effects as per the GBA+. To understand the community and Indigenous context and 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 social determinants of health approach to identify and describe relevant health outcomes. Social indicators of health should be selected to reflect the setting and circumstances of the affected communities and should be selected from the suite of indicators commonly recommended by the Public Health Agency of Canada, including the following:
  - physical environments
  - employment and working conditions
  - social environments
  - health services
  - income and social status
  - education and literacy
  - gender
- complete a community health profile that describes the overall health of the community which may include information on birth rates, death rates, sexually transmitted infections, injuries, chronic disease rates, 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 the existing health services and programs, including health care provider capacity;
- describe drinking water sources, both surface and/or groundwater (permanent, seasonal, periodic or temporary), including approximate wellhead capture zones;
- describe the consumption of country foods (traditional foods) outside of the commercial food chain, including food that is trapped, fished, hunted, harvested or grown for subsistence, medicinal purposes or has Indigenous cultural importance;
- provide baseline contaminant concentrations in the tissues of country foods (traditional foods) consumed by Indigenous groups and local communities;
- describe the status of food security within the Indigenous groups and local communities; and
- describe which country foods (traditional foods) are consumed by which Indigenous groups, how much, how frequently, and where these country foods (traditional foods) are harvested.

Guidance for developing baseline information relevant to human health is identified in Appendix 1.

9. Baseline Conditions – Social

Baseline information is required on existing social conditions and must include social well-being and social activities for individual communities and Indigenous groups. The scope and content of the social baseline conditions should be tailored to the specific project context, take into account community and Indigenous input, and should include indicators and information that are useful and meaningful for the effects analysis. The information provided must:

- be sufficient to provide a comprehensive understanding of the current state of each VC, including relevant trends;
- describe how community and Indigenous knowledge related populations was used in establishing social baseline conditions, including input from diverse subgroups; and
- describe baseline social conditions using disaggregated data for diverse subgroups within the community to support GBA+.

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

- influences on community well-being;
- access, ownership and use of resources (e.g. land tenure, minerals, food, water, social infrastructure);
- capacity (currently available or planned) of institutions to deliver public services and infrastructure;
- relevant historical community background; and
- applicable history with previous developers.

Information related to interested parties, those likely to be affected directly and indirectly by the project should be provided in association with a consideration of those in the community who are considered particularly vulnerable to changes brought about by the project.

Baseline information must be sufficiently disaggregated and analysed to support the analysis of disproportionate effects as per GBA+. The information provided must:

- describe the general patterns of human occupancy and resource use based on the spatial and temporal boundaries selected (include maps where available);
- describe the rural and urban settings;
- provide general information about local populations and diverse subgroups (e.g. women, gender-diverse people, youth, elders, people with disabilities) and their roles and responsibilities in the communities;
- describe sites or areas that are used by local populations and Indigenous peoples either for permanent residences or on a seasonal/temporary basis and the number of people who use each site or area identified (include a map(s), where possible);
- describe the existing local and regional infrastructure in the study area, including: railways, highways, and traffic levels and patterns, pipelines, water mains, sewage lines, existing power lines and any other potential affected facility;
- describe the existing local and regional services in the study area such as; accommodation, recreation, waste disposal, police, fire fighting, ambulance and health care services, education;
- describe social and community services (e.g. day care);
- describe existing navigable waterways and provide a listing of potentially affected waterway users and concerns regarding waterway use and access;
- describe current use of all waterways and waterbodies, including recreational uses; and
- describe structures, sites and things of historical, archaeological, paleontological, cultural, spiritual or architectural significance.

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

10. Baseline Conditions – Economic

This economic baseline should document the local and regional economic conditions and trends based on the spatial and temporal boundaries selected. The scope and content of the economic baseline should reflect the specific project context, take into account community and Indigenous group input, and should include indicators and information that are useful and meaningful for the effects analysis. The information provided must:

- be sufficient to provide a comprehensive understanding of the current state of each VC, including relevant trends;
- describe how community and Indigenous knowledge from related populations, including input from diverse groups, was used in establishing baseline conditions; and
- describe baseline economic conditions for diverse subgroups within the community to support GBA+.

Information on those likely to be affected directly and indirectly by the project should be provided in association with a consideration of those in the community who are considered particularly vulnerable to changes brought about by the project. As applicable, the baseline information must be sufficiently disaggregated and analysed to support the analysis of disproportionate effects as per GBA+.

The Impact Statement must:

- describe the main economic activities in the study area;
- describe the labour force, including the availability of skilled and unskilled workers, existing working conditions, wages and/or average salary range, full-time and part-time employment and training;
- provide an overview of the availability of businesses that may provide supplies and services required for the project;
- describe the demographic features of the local and regional population as well as any prevalent economic concerns and economic 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;
- characterize the economic conditions to support the assessment of project related effects, including the differences of experiences by diverse subgroups, including Indigenous populations, as appropriate (e.g. women, youth, elders);
- describe the current use of land and water bodies in the study area including a description of hunting, recreational and commercial fishing, trapping, outdoor recreation, use of seasonal cabins, outfitters, agriculture, forestry and institutional; and
- describe marine commercial fisheries, including species fished, number of licences, value of fisheries and breakdown between domestic vs. international fisheries, where applicable.

11. Baseline Conditions - Indigenous Peoples

Proponents are encouraged to engage with Indigenous groups in developing baseline conditions, in order to identify and understand the potential impacts of their projects on Indigenous peoples, and to incorporate Indigenous knowledge into the impact assessment. The results of any engagement should be presented in the Impact Statement, and, as best as possible should reflect the perspective of the Indigenous peoples involved.

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

Where Indigenous groups do not wish to participate, the proponent is encouraged to continue sharing information and analysis with the Indigenous groups of the potential effects of the project, and to use available public sources of information to support the assessment.

The proponent is encouraged to consult Agency guidance on engaging Indigenous groups, in particular, *Guidance on Assessing Potential Impacts on the Rights of Indigenous Peoples under the Impact Assessment Act*.

Where possible, the impact statement should include contextual information, both historic and current, regarding an Indigenous group's history and cultural practices, land use, as well as the manner in which rights of Indigenous peoples are, or may be, exercised and impacted by the project, as identified by the Indigenous groups. The contextual information may include the following:

- the physical and cultural heritage of each Indigenous group;
- the current use of lands and resources for traditional purposes;
- the health, social, and economic conditions of Indigenous peoples; and
- 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 give consideration to understanding historical baseline conditions associated with 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 considered to include, but is not limited to, any site, structure or thing of archaeological, paleontological, historical or architectural significance.

Information with respect to Indigenous groups can include:

- burial sites;
- cultural landscapes;
- oral histories;
- cultural values and experiences of being on the land;
- Indigenous governance systems and Indigenous laws tied to the landscape;
- sacred, ceremonial or culturally important places, plants, animals, objects, beings or things; and
- archaeological potential and/or artefact places.

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, ceremonial or spiritual practices). Proponents are encouraged to refer to guidance on the Agency's website on how to consider the current use of lands and resources for traditional purpose.

In general, the Impact Statement should consider:

- location and description of Treaty rights, title area, land claims or traditional territory (including maps where available);
- location of reserves and communities;
- traditional activities presently or historically practiced (e.g. hunting, fishing, trapping, gathering of plants or medicines);
- location of traditional uses, including hunting, trapping, and fishing camps, cabins and gathering or teaching grounds;
- types of traditional resources such as fish, wildlife, birds, plants or other natural resources and their habitats of importance for supporting traditional use;
- places where culturally important fish, wildlife, birds, plants or other natural resources are harvested;
- access and travel routes for conducting traditional practices;
- frequency, duration or timing of traditional practices;
- where known, efforts of the groups to bring back traditional practices;
- description of country foods (traditional foods);
- the quality and quantity of resources (e.g. preferred species and perception of quality);
- access to resources (e.g. physical access to harvest specific 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 disturbances, air quality, visual landscape, perceived or real contamination, etc.); and,
- other current uses identified by Indigenous groups.

Should this type of information be found through public sources, the proponent should advise the Indigenous group and offer a reasonable opportunity to review and comment before including it in the Impact Statement.

11.3 Health, social and economic conditions

The baseline conditions requirements set out in the sections above for health, social and economic conditions, include Indigenous peoples and GBA+ specific to Indigenous peoples.

11.4 Conditions Related to the Rights of Indigenous Peoples

The Impact Statement should document the nature and extent of the exercise of rights of Indigenous peoples, potentially impacted by the project, as identified by the Indigenous group(s). Indigenous groups may also provide their perspective through consultations with the Agency. This information related to rights may include, but is not limited to:

- a general description of the section 35 rights exercised in the area of the project, including the historic, regional and community context;
- the quality and quantity of resources required to support exercise the right (e.g. preferred species);
- access to the resources required to exercise rights (e.g. physical access to culturally important places, timing, seasonality, distance from community);
- the experience associated with 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 group's exercise of rights (e.g. large, intact and diverse landscapes, areas of solitude; connection to landscape);
- where possible, information about members within an Indigenous group, and their role in the exercise of rights (e.g. women, men, elders, youth, people with disabilities);
- how the Indigenous group's cultural traditions, laws and governance systems inform the manner in which they exercise the rights (the who, what, when, how, where and why);
- where they exist, identification of thresholds identified by the community that, if exceeded, may impair the ability to meaningfully exercise of rights;
- maps and data sets (e.g. overlaying the project footprint, places of cultural and spiritual significance, 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. Effects Assessment

12.1 Methodology

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, suspension, decommissioning, and abandonment). 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 proponent is expected to employ standard risk assessment frameworks, where possible.

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.

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).

12.2 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.

13.Predicted Changes to the Physical Environment

Changes to the components of the physical environment outlined below are interrelated with other components as part of the broader ecosystem. The description of changes to the physical environment is to be integrated into the effects assessment of each VC and the interaction between VCs in the Impact Statement.

13.1 Changes to the atmospheric, acoustic, and visual environment

The Impact Statement must:

- provide a quantitative assessment of criteria air contaminants (total particulate matter, PM_{10}, PM_5, sulphur oxides, nitrogen oxides, volatile organic compounds, and carbon monoxide) as well as any air contaminants potentially associated with the project;
- provide an assessment of project emissions potentially contributing or adding to existing ground ozone levels;
- include an atmospheric dispersion model of the criteria air contaminants in order to estimate the contaminant concentrations present in the entire area that could potentially be affected by atmospheric emissions resulting from various project-related activities (sources), including the use of heavy machinery during construction, the facility operations, and road, rail and marine transportation (provide appropriately scaled contour map(s) plotting the predicted emissions). The choice of air quality model must be appropriate for the complexity of sources, terrain and meteorology;
- provide details of all air quality model configuration, including meteorology, land-use, gridded and sensitive receptors and chemical and physical transformation settings;
- assess the potential for emissions from the project to contribute to acid deposition and exceedances of critical loads for terrestrial and aquatic ecosystems;
- describe the source characteristics (e.g. point emissions, area sources, flaring and incineration emissions, and fugitive sources);
- provide emission rates for all project and regional sources within the study area, including emission factors (with methodology, uncertainty assessment and references) and all assumptions and related parameters that would enable calculations to be reproduced;
- use established methods for estimating emissions from on-road and off-road activities;
- provide a comparison of predicted air quality concentration against the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter (PM_5), sulphur dioxide (SO_2) and nitrogen dioxide (NO_2) and ozone (O_3). Predicted concentrations for other air pollutants relevant to the project should be compared with appropriate provincial and territorial guidelines. The assessment against CAAQS should be based on the principles of "keeping clean areas clean" and "continuous improvement", and in the context of air sheds and air zones with the Air Quality Management System;
- describe participation in national or regional air emission tracking and reporting programs or provide rationale why participation is not required;
- provide a description of all methods and practices (e.g. control equipment, heat or gas recovery systems) to be implemented to reduce and control emissions.. If the best available technologies are not included in the project design, the proponent needs to provide a rationale for the technologies selected;
- provide details of the achievement of emission standards for all mobile and stationary engines used in the project;
- provide justification for all control efficiencies used to reduce emission rates of sources within the model, including details of all assumptions associated with the related mitigation measures, and their achievability;
- describe changes in ambient vibration and sound levels resulting from the project;
- where there is public concern associated with an increase in sound levels during construction, provide a vibration and sound IA, including an overview of the concerns;
- for projects that result or may result in an increase in sound emissions during any phase of the project, the Impact Statement must:
  - quantify sound levels at appropriate distances from any project facility and/or activities and describe the frequency, duration and character of sound;
  - describe the locations and characteristics of the most sensitive receptors including species at risk; and
  - describe consultation with regulators, stakeholders, community groups, landowners and Indigenous groups about potential effects to the acoustic environment.
- identify and justify the approach to determine the extent to which sound effects resulting from the project are adverse and describe any changes in night-time light levels as a result of the project; and
- describe any positive changes.

Guidance from Health Canada regarding air quality health and noise impacts is identified in Appendix 1.

13.2 Changes to groundwater and surface water

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

- provide a project-specific water use assessment identifying and describing the quantity and quality of water resources potentially affected by the project, including water withdrawn from local waterbodies used as a supply source, the flow or volume of water available in the waterbodies, and how and where waste waters would be discharged;
- present a 3-dimensional numerical groundwater flow model of the hydrogeological system that incorporates all major project features such as open pits, underground workings, waste rock piles, tailings management facilities, dewatering wells, and water diversion ditches:
  - the model should be based on the calibrated model used to describe baseline conditions; and
  - the use of telescopically refined groundwater flow models is recommended in the vicinity of open pits and tailings management facilities.
- using the numerical groundwater flow model, estimate key project fluxes, including open pit or mine inflow rates, pit or mine dewatering rates, pit or mine flooding rates, and tailings seepage rates during the operations and post-closure periods;
- using the numerical groundwater flow model, estimate changes to surface water and groundwater regimes during the operations and post-closure periods, including effects of mine dewatering on lake levels, effects on baseflow in rivers and streams, effects on wetlands, effects on recharge and discharge, effects on potable supplies, and effects on natural flow divides; and
- provide drawings and/or figures showing groundwater piezometric contours to illustrate projected seepage patterns for applicable project components.

With respect to potential project effects on water quality in the receiving environment, the Impact Statement must:

- present any applicable site water management plan, including water diversion and mine flooding strategy in the post-closure period;
- present estimates of surface water runoff rates for major project components, including waste rock piles, ore stockpiles, and tailings management facilities;
- present an integrated site water balance model incorporating surface and groundwater fluxes to or from all major project components, for the operations and post-closure periods;
- present an integrated chemical mass balance model incorporating surface and groundwater chemical loads to or from all major project components, for the operations and post-closure periods;
- describe any applicable water quality treatment measures and provide evidence supporting the effectiveness of these measures;
- describe the quantity and quality of all effluent streams released from the site to the receiving environment, including seepage from tailings management facilities, overflow from pits or mine workings, and surface runoff from mine components;
- describe changes to groundwater quality due to effluents from the project, including changes to physicochemical parameters (temperature, pH, salinity, dissolved oxygen), chemical constituents (major and minor ions, trace metals, radionuclides, nutrients, organic compounds);
- describe any changes to groundwater quality that could affect surface water quality;
- provide an assessment for off-site migration pathways for impacted groundwater, and an analysis of contaminant attenuation capacities within the hydrogeological units of the project study area;
- describe changes to surface water quality due to effluents from the project including changes to physicochemical parameters (temperature, pH, salinity, dissolved oxygen, turbidity), chemical constituents (major and minor ions, trace metals, radionuclides, nutrients, organic compounds); and
- describe groundwater and surface water monitoring programs during the operations and post-closure periods.

With respect to potential project effects on water quality resulting from acid rock drainage and/or metal leaching, the Impact Statement must:

- describe the types of method used to predict acid rock drainage and/or metal leaching on sample tailings, waste rock, and ore;
- provide an assessment of short-term metal leaching properties;
- provide longer term kinetic testing to evaluate rates of acid generation, if any, and metal(loid) leaching;
- describe the quality of humidity cell or column test leachate from acid rock testing;
- compare results of acid rock drainage-metal leaching tests to the authorized limits of deleterious substances listed on Schedule 4 of the Metal and Diamond Mining Effluent Regulations, as well as the pH of effluent and the requirement for effluent to be non-acutely lethal;
- provide estimates of the potential for mined materials (including waste rock, tailings and low grade ore) to be sources of acid rock drainage or metal leaching; estimates of potential time to the onset of acid rock drainage or metal leaching;
- provide estimates of surface and seepage water quality from the waste rock dumps, tailings impoundment facility, stockpiles and other infrastructure during the operations and post-closure periods;
- provide estimates of pit water chemistry during the operations and post-closure periods using geochemical modeling of pit water quality if necessary;
- provide waste rock, tailings and low grade ore volumes and tonnage, and disposal methods;
- assess the feasibility of segregating potentially-acid generating and non-potentially acid generating waste materials during operations, proposed geochemical segregation criteria and identification of operational methods that will be required to achieve geochemical characterization during operations (i.e. geochemical surrogates, on site lab, procedures needed, etc.);
- provide a sensitivity analysis to assess effects of imperfect segregation of waste rock;
- describe methods to prevent or control acid rock drainage and metal leaching during the operations and post-closure periods;
- describe acid rock drainage and metal leaching prevention/management strategies under a temporary or early closure scenario, including low grade ore; and
- describe contingency plans, operational and post-closure monitoring, and maintenance plans.

13.3 Changes to riparian, wetland and terrestrial environments

The Impact Statement must:

- provide an overall description of changes related to landscape disturbance including fragmentation of habitats and project effects on areas of ground instability;
- describe any hydrological or drainage changes that may alter moisture regimes and how that may affect vegetation;
- describe any contaminants of concern potentially associated with the designated project that may affect soil, sediment or water;
- describe effects to riparian, wetland and terrestrial biodiversity considering biodiversity metrics, effects of fragmentation, changes to regional biodiversity;
- describe the historical land use and the potential for contamination of soils and sediments and potential for loss of soil fertility. Describe any known or suspected soil contamination within the study area that could be re-suspended, released or otherwise disturbed as a result of the project;
- describe the vegetation standards and controls to be implemented while constructing and operating the project. Describe any integrated vegetation management programs, including:
  - the criteria and circumstances for applying chemical, biological or mechanical control methods;
  - the methods to be used to prevent spread of non-native, invasive species; and
  - the selection of plant species to be kept and planted to promote naturally low growing plant communities (e.g. for linear projects).
- describe any revegetation procedures to be implemented as part of the project including:
  - revegetation techniques and the locations where they would be implemented;
  - seed mixes to be used, application rates and location of application;
  - fertilizers to be used, application rates and locations, and criteria for determining these specifications; and
  - contingency planting and seeding plans that include a description of species to be replanted, the locations for replanting and criteria for determining these specifications.
- describe any positive changes (e.g. from offsets that result in re-vegetation, new wetlands etc.)

13.4 Changes to the marine environment

The Impact Statement must:

- describe the physical effects to the estuarine and marine environment, including:
  - changes to water and sediment quality and characteristics (temperature, chemical composition, nutrients, turbidity), oceanographic conditions, etc.;
  - changes to bathymetry;
  - changes to the marine ecosystem, including effects to biodiversity;
  - changes to the marine resources and habitat;
  - changes in marine animals behaviour, including migration, feeding and breeding patterns due to an increase in noise, destruction of habitat; and
  - changes caused by ship traffic.
- describe the sources, quantities and frequency project related emissions and discharges to the marine environment from vessels, including drill ships, drilling and production platforms or any other type of vessels or seafloor infrastructure. This should include, but not be limited to, discharges of ballast water, grey water, sewage, food waste, deck wash, muds and drill cuttings resulting from all phases of the project or any accidental spills of any kind;
- for marine projects that require dredging or disposal at sea, provide a description of:
  - the location of dredging activity (including a bathymetric chart of the area);
  - local conditions, including seasonal flow currents and tide cycles that inform sediment transport;
  - the sediments to be dredged and disposed (e.g. quantities, particle size) based on a sampling program representative of site conditions;
  - characterization of sediment quality where there is a risk of contamination;
  - the proposed location of disposal activity (including a bathymetric chart of area) and supporting rationale for a preferred disposal site along with alternatives considered;
  - how disposal is to be conducted along with alternatives considered;
  - the predicted dispersion and deposition of sediments over time of both dredging and disposal using scientifically acceptable techniques, including dispersion modeling where appropriate. Such predictions would include attention to suspended solids in the water column or turbidity, and to short and long-term accumulation of material on the seafloor along with contaminant concentrations; and
  - the route, duration and number of trips between dredging site and disposal site(s) along with equipment employed.
- describe the effects to the use of the marine environment, including estuarine, salt marsh and marine habitats; and
- describe how seawalls, jetties, groins, breakwaters, navigation channels, deepening, inlet formation, and sand removal by mining affect longshore currents or littoral drift that move sediment downdrift along the beach and contribute to shoreline retreat, deposition updrift and erosion downdrift.

13.5 Radiological conditions

For all phases of the project, and where appropriate and integrated into other appropriate sections within the Impact Statement, the Impact Statement must:

- describe changes to radiation and radioactivity on the biophysical environment and on human health (e.g., workers, public, Indigenous) for all relevant routes of exposure (both internal and external exposure scenarios); and
- provide information on radiation levels to which members of the public may be exposed, including consideration of consumers of country food whose exposure pathways may differ due to cultural norms; for example, any dietary characteristics of Indigenous peoples.

13.6 Electromagnetism and corona discharge

For projects that could potentially create increased electromagnetism or corona discharges within the study area (e.g. new high voltage transmission lines) the Impact Statement must:

- describe the levels of noise;
- describe ozone concentrations;
- describe electric field gradient and magnetic field strength expected at the edge of any transmission line right-of-way and maximum loading;
- describe predicted electromagnetic field levels;
- provide any relevant standards;
- identify the potential for electromagnetic interference with radio, television or other telecommunication signals and reception at maximum loading and describe the area potentially affected, the frequency and duration of occurrence and any applicable standards; and
- describe potential induction effects to other infrastructure operators, and where applicable, describe any authorizations required and consultations with potentially affected infrastructure operators.

14. Effects to Valued Components - Environment

Within the context of the predicted changes to the physical environment, the proponent must assess the effects of the project on environmental VCs. Interconnections between environmental VCs and social, health and economic VCs and interactions between effects must also be described.

14.1 Fish and fish habitat

The Impact Statement must:

- describe any direct, incidental or cumulative predicted positive and/or adverse effects to fish (all developmental stages) and fish habitat as defined in subsection 2(1) of the Fisheries Act, including the calculations of any potential habitat loss (temporary or permanent) including spawning grounds, nursery, rearing, food supply, and migration areas, or death of fish. The assessment must include a consideration of:
  - the geomorphological changes and their effects to hydrodynamic conditions and fish habitats (e.g. modification of substrates, dynamic imbalance, silting of spawning beds);
  - the modifications of hydrological, hydrometric and oceanographic conditions on fish habitat, critical habitat for aquatic species at risk, and on the fish species' life cycle activities (e.g. reproduction, fry-rearing, movements);
  - potential effects to riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat (e.g. structure, cover);
  - changes to water quality both at the discharge point and in the receiving environment;
  - describe effects to fish biodiversity considering identified biodiversity metrics;
  - any potential imbalances in the food web and trophic levels in relation to baseline conditions;
  - effects to the primary and secondary productivity of water bodies and how project-related effects may affect fish food sources;
  - potential for direct effects from contaminants on fish and also bioaccumulation of contaminants (e.g. selenium, mercury) in fish downstream of the project; and
  - potential direct and incidental effects on fish behaviour, distribution, abundance, migration patterns.
- potential losses of individuals and relationship to population density and the resiliency of a population;
- describe the effects of changes to the aquatic environment on fish and their habitat, including:
  - the anticipated changes in the composition and characteristics of the populations of various fish species and provincially or federally listed aquatic species at risk;
  - describe any modifications in migration, local movements (e.g. upstream and downstream migration, and lateral movements) or stranding of fish, following the construction, operation or closure of works (e.g. physical, chemical and hydraulic barriers);
  - identify any reduction in fish populations as a result of potential overfishing due to increased access to the project area;
  - contaminant levels in harvested species and their prey; and
  - describe any modifications and use of habitats, including the ability to access the habitat.
- include a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous/catadromous species, and any potential effects resulting from overlapping periods;
- a discussion of how vibration caused by project activities (e.g. blasting) may affect fish habitat and behaviour, such as spawning or migrations;
- describe potential effects from impingement and entrainment of fish and other aquatic biota through water withdrawal and from subsequent release of heated effluent (e.g. water cooling systems for nuclear power generation);
- describe any need for an Fisheries Act authorization and/or a Species at Risk Act permit and describe any consideration of Department of Fisheries and Oceans guidance documents;
- for linear projects, describe and justify watercourse-crossing techniques to be used and the criteria for determining the techniques proposed for each watercourse-crossing;
- include a risk assessment of the potential introduction and intrusion of aquatic invasive species due to, for example, ballast water discharge, ship wash;
- describe effects from changes in sound level and exposure (e.g. blasting, shipping);
- describe effects from changes in light level;
- describe any positive changes, such as habitat creation;
- describe the anticipated changes in the composition and characteristics of the populations of fish, following modifications to the aquatic environment, including but not limited to:
  - disruption of life stages or habitat with regard to their productivity, life cycles, migration, or local movements, including a consideration of feeding, calving, nursing, overwintering, resting;
  - disruption of feeding activities;
  - distribution and abundance;
  - contaminant levels in harvested species and their prey;
  - acoustic masking of echolocation or communication calls;
  - a consideration of a change in: behavior, displacement, access to habitat, habitat structure, species composition, ecosystem structure and function and habitat quality; and
  - marine animal health and condition.
- describe the potential effects of marine traffic and sound on marine animal individuals or populations, including, but not limited to:
  - risk of collision with vessels (ship strike);
  - disruption of activities such as resting, feeding, calving, movement, migration;
  - marine mammal behaviour, including the physiological effects of underwater sound on individuals;
  - increased turbidity; and
  - ballast discharge and potential for introduction of invasive species.
- describe any project effects to other marine organisms, including but not limited to: sea turtles, benthic organisms, shellfish coral; and
- describe any changes to marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton.

For projects requiring the use of natural water bodies frequented by fish for the disposal of mine waste and/or for the management of process water, an amendment to the *Metal and Diamond Mining Effluent Regulations* (MDMER) will be required. This regulatory process will not be initiated until the proponent has undertaken a detailed assessment of alternatives for mine waste disposal. By fulfilling the requirements of the regulatory authorization during the Impact Assessment, authorizations may be granted in an accelerated manner. For further guidance, the proponent should consult Environment and Climate Change Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* (see Appendix 1).

14.2 Birds, migratory birds and their habitat

The Impact Statement must:

- describe direct, incidental and cumulative predicted positive and/or adverse effects to migratory birds and non-migratory birds, including population level effects that could be caused by all project activities, including but not limited to:
  - site preparation/vegetation removal;
  - deposit of harmful substances in waters that are frequented by migratory birds;
  - changes to the aquatic flow regime and sediment load;
  - flaring of gas; and
  - site reclamation.
- describe short term and long term changes to habitats and food sources of migratory and non-migratory birds (types of cover, ecological unit of the area in terms of quality, quantity, distribution and functions), with a distinction made between these two birds categories, including losses, structural changes and fragmentation of riparian habitat (aquatic grass beds, intertidal marshes), terrestrial environments (e.g. grasslands, forested, old growth, post fire) and wetlands frequented by birds;
- describe the changes to the bird-habitat relationships; the change in biodiversity, abundance, and density of the avian community that utilise the various habitat types or ecosystems;
- describe the change in mortality risk, including as a result of collision of migratory birds with flaring gas, any project infrastructure, vessels and vehicles; and
- describe the incidental effects caused by increased disturbance (e.g. sound, artificial light, presence of workers), relative abundance movements, considering the critical periods for the birds, including but not limited to breeding, migration and overwintering.

14.3 Terrestrial wildlife and their habitat

The Impact Statement must:

- describe the potential direct, incidental and cumulative adverse effects to other wildlife and wildlife habitat, including population level effects that could be caused by all project activities, including but not limited to: any linear access corridors (roads, transmission lines, rights of way) particularly in the vicinity of wetland, lake and riparian habitats and on migratory corridors;
- describe effects to terrestrial wildlife biodiversity considering biodiversity metrics, effects of fragmentation, changes to regional biodiversity;
- describe the potential adverse effects of the designated project on species noted as important to Indigenous groups and local communities and their habitat 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 rights of way on wildlife mortality risk and movement patterns; and
- describe changes to key habitat for species important to current use of lands and resources for traditional purposes.

14.4 Species at risk

The Impact Statement must:

- describe the potential direct, incidental and cumulative adverse effects of the designated project on species at risk listed under Schedule 1 of the *Species at Risk Act* and, where applicable, its critical habitat (including its extent, availability and presence of biophysical attributes);
- describe the potential adverse effects of the project on species protected by provincial statutes and assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat that are not currently listed under the *Species at Risk Act*;
- identify critical timing windows (e.g. denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species;
- identify provincial, territorial or federal permits or authorizations that may be required in relation to the species at risk;
- describe all reasonable alternatives to the project that would avoid the potential effect on species and their habitat, with particular attention to critical habitat;

- describe all feasible measures that will be taken to avoid or lessen the impact of the project on the species and its critical habitat;
- 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, harassed; and
- the number of residences damaged or destroyed.
- describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted);
- describe all feasible measures that would be taken to eliminate the effect of the work or activity on species and their habitats, including critical habitat; and
- provide an account of how the project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species.

14.5 Climate Change

The Impact Statement must:

- provide a description of each of the project's main sources of GHG emissions by greenhouse gas type;
- provide the estimated annual GHG emissions from each source;
- provide an estimate of yearly net GHG emissions and emissions intensity, including an uncertainty assessment;
- provide a qualitative description of a project's positive or negative impacts on carbon sinks;
- describe how the project may contribute to Canada's efforts to reduce GHG emissions, if applicable (e.g. the Impact Statement could explain how the project would result in emission reductions in Canada by avoiding emissions from another source);
- describe how the designated project could impact global GHG emissions, including the following scenarios:
  - if there is a risk of carbon leakage if the project is not built in Canada, the Impact Statement could include an explanation of the likelihood and magnitude of carbon leakage if the project is not approved; and
  - if a project may displace emissions internationally, the Impact Statement could describe how the project is likely to result in global emission reductions. For example, a project that enables the displacement of high-emitting energy abroad with lower emitting energy produced in Canada could be considered as having a positive impact.
- provide quantitative estimate of upstream GHG emissions associated with the project based on the project's maximum throughput (new project) or additional throughput (replacement or expansion project) including information on the methodology, data, assumptions, and approach to estimating those upstream GHG emissions; and

- provide a qualitative discussion about the incrementality of the upstream GHG emissions, describing the conditions under which the upstream emissions estimated could be expected to occur regardless of whether the project proceeds.

Additional guidance related to greenhouse gas emissions and climate change is included in the draft Strategic Assessment of Climate Change developed by Environment and Climate Change Canada.

15. Effects to Valued Components – Human Health

Social, economic, health, and biophysical impacts are interconnected. Change in any one of these domains will often lead to changes in the others. Within the context of the predicted changes to the biophysical environment, social and economic conditions resulting from the designated project, the proponent must assess the adverse and positive effects of the project on human health. Interconnections between human health and other VCs and interactions between effects must be described.

The proponent must describe how community and Indigenous knowledge was used to collect baseline data and assess health effects and disaggregate the source of community knowledge by representation by sex, age and other community relevant identity factors to support identification of disproportionate effects through the application of GBA+. In assessing effects, the analysis should consider circumstances in a community where diverse subgroups, because of their particular circumstances, could experience adverse effects from the designated project more severely than others or be excluded from potential benefits.

The assessment must illustrate an understanding of linkages and effect pathways, so that when a change in one domain is predicted, there is an understanding of what other effects or consequences may be felt across the other domains. Applying a determinants of health approach in the assessment of human health effects will support the identification of these linkages as well as of disproportionate effects across subgroups.

All interconnections between human health and other VCs and interactions between effects must be described.

The Impact Assessment must:

- provide an assessment of adverse and positive effects on human health or changes to the baseline community health profile based on changes to the environment, health, social and economic conditions, focusing on effects to health outcomes, risks or social determinants of health in consideration of, but not limited to, potential changes in:
  - air quality;
  - noise exposure and effects of vibration;
  - current and future availability (including contamination/quality) of country foods (traditional foods); and
  - current and future availability (including contamination/quality) of water for drinking, recreational and cultural uses.
- employ best practices in Health Impact Assessment methods;
- conduct a problem formulation exercise/preliminary model predictions to determine whether a Human Health Risk Assessment is required. The proponent must provide a rationale/explanation if problem formulation/preliminary model predictions indicate that a Human Health Risk Assessment is not warranted;
- if a Human Health Risk Assessment is conducted, the assessment must examine all exposure pathways for contaminants of concern to adequately characterize potential biophysical risks to human health. A multimedia Human Health Risk Assessment may need to be considered and conducted for any contaminant of potential concern with an identified risk and multiple pathways;
- provide the rationale if a determination is made that an assessment of the potential for contamination of country foods (traditional foods) (or other exposure pathways, such as inhalation) is not required or if some contaminants are excluded from the assessment;
- describe and quantify potential effects to mental and social well-being (e.g. stress, depression, anxiety, sense of safety);
- describe and quantify the project-related activities, contaminants of potential concern, nuisances and environmental, social and economic changes that could potentially be sources of adverse human health effects and the potential human receptors of these effects;
- describe and quantify specific thresholds and document if different thresholds were considered for vulnerable populations including by sex and age; provide rationale and justification if specific thresholds not used;
- in situations where project related air, water or noise emissions meet local, provincial, territorial or federal guidelines, and yet public concerns were raised regarding human health effects, provide a description of the public concerns and how they were or are to be addressed;
- identify predicted effects of the project on the quality and quantity of ground or surface water used for domestic uses;
- identify predicted visual or other aesthetic effects of the project on existing land use in the study area;
- document potential effects on access to health services, including increased use of health and related health-social services in relevant communities;
- food security: describe effects to availability, use and consumption of country foods (traditional foods) and health impacts of this effect;
- describe how community and Indigenous knowledge was used in assessing human health effects;
- apply GBA+ across all health effects and document how potential effects or changes to human health conditions could be different for diverse subgroups, including Indigenous peoples or other community relevant subgroups (e.g. women, youth, elders); and
- describe any positive health effects (e.g. resulting from improved economic opportunities, increased access to services).

Guidance from Health Canada regarding human Health Impacts is identified in Appendix 1.

16. Effects to Valued Components – Social

Within the context of the predicted changes to the biophysical environment, health and economic conditions resulting from the designated project, the proponent must assess the effects of the project on social conditions. Interconnections between social VCs and other VCs and interactions between effects must be described.

VCs that require assessment are listed below, including select considerations and indicators to be included in the analysis. If, after engaging with communities and conducting further analysis, the proponent determines that the information and VCs listed below could be more meaningfully organized and presented in an alternate way, it may do so with an explanation and rationale for these changes.

The proponent must describe how community and Indigenous knowledge was used to collect baseline data and assess social effects, and disaggregate the source of community and Indigenous knowledge by representation by sex, age and other community relevant identity factors to support identification of disproportionate effects through the application of GBA+. In assessing effects to VCs listed below, the analysis should discuss circumstances in a community where diverse subgroups, because of their particular circumstances, could experience adverse effects from the designated project more severely than others, or be excluded from potential benefits.

As applicable to the assessment, the analysis should describe the goals of local or regional land use plans or local or regional development plans and the extent to which the project is aligned with such plans to avoid or enhance social effects. For the VCs listed below, the effects assessment should explore and discuss opportunities by which benefits to local communities can be enhanced.

16.1 Services and infrastructure

The Impact Statement must:

- describe the predicted effects to the local and regional infrastructure facilities and services in the study area, including adverse and positive effects to:
- accommodation/lodging (e.g. affordability, availability, appropriateness), including camping facilities;
- recreation and parks;
- waste disposal;
- road infrastructure and traffic safety;
- police and firefighting;
- educational services, facilities and day care;
- ambulance and health care services; and
- describe any need for government and/or proponent expenditures for new or expanded services, facilities or infrastructure, arising out of project-related effects.

16.2 Land and resource use and recreation

The Impact Statement must:

- describe the potential interactions of the designated project with local and regional land use and resource activities, including adverse and positive effects to:
  - transportation and utilities corridors;
  - residential land use;
  - forestry and logging operations;
  - commercial outfitters;

    - agriculture, including predicted effects to livestock health and productivity; and
    - other land uses.
- describe predicted effects to recreation (e.g. hunting, fishing, hiking, wildlife viewing, aesthetic enjoyment) by the community and Indigenous groups, including effects to:
    - access to the resources;
    - quantity and quality of the resources; and
    - overall experience when undertaking recreational activities, including noise effects.
- describe changes to viewscapes as a result of the project; and
- identify predicted effects of the project on the quality and quantity of ground or surface water and implications for recreational uses.

16.3 Navigation

The Impact Statement must:

- describe navigable waterways that could be impacted by the project;
- describe ancillary project components that will be constructed in, on, under, over, through or across navigable waterways to support the project;
- describe potentially affected waterway users and describe consultation with waterway users and Indigenous groups regarding navigational use, issues raised and how issues were addressed; and
- describe project effects to navigation and navigation safety.

16.4 Community well-being

The Impact Statement must:

- assess potential adverse and positive effects of changes to social conditions including, but not limited to:
    - food security;
    - income inequity;
    - changes at the community level that affect social conditions as result of increased population, workers camps, economic activity, cost of living, among other factors; and
    - non-commercial / trade economy.
- describe in- and out-migration effects, including changes in social and cultural make-up of affected communities and changes in populations;
- identify whether social divisions might be intensified as a result of a project;
- evaluate potential social effects associated with increased disposable income, including potential cost-of-living effects, adverse and positive lifestyle changes, distribution of benefits among affected people;
- describe any anticipated effects to language;
- describe changes to viewscapes as a result of the project and potential effects to community well-being;
- consider the potential for stresses on community, family and household cohesion, alcohol and substance abuse, or illegal or other potentially disruptive activities; and
- apply GBA+ within the information related to community well-being and document how potential effects of changes to community well-being could be different for diverse subgroups, including Indigenous peoples or other relevant subgroups (e.g. women, youth, elders).

16.5 Structure, site, things of historical, archaeological, paleontological or architectural significance

The Impact Statement must:

- assess potential effects to changes to structures, sites or things of historical, archaeological, paleontological or architectural significance and associated effects on other social and economic conditions.

17. Effects to Valued Components – Economic

Within the context of the predicted changes to the biophysical environment, and health and social conditions, the proponent must assess the effects of the project on the economic VCs. All interconnections between these economic VCs and other VCs and interactions between effects must be described.

The proponent must describe how community and Indigenous knowledge was used to collect baseline data and assess economic effects and disaggregate the source of community and Indigenous knowledge by representation by sex, age and other community-relevant identity factors to support identification of disproportionate through the application of GBA+. In assessing effects to VCs listed below, the analysis should discuss circumstances in a community where diverse subgroups, because of their particular circumstances, could experience adverse effects from the designated project more severely than others, or be excluded from potential benefits.

The assessment of economic effects should take into consideration the temporal scale for construction, operation and beyond, to assess the potential for, and avoidance of, boom-and-bust cycles potentially associated with the project.

The Impact Statement must describe potential positive and adverse effects to the local, regional and provincial economies, including whether and how local benefits can be maximized. It must include:

- an estimate of the anticipated levels of local and regional economic participation in the project in comparison to the total project requirements (e.g. number of workers and total value of local and regional contracts). The proponent should also:
    - provide the information in the context of existing employment rates and economic well-being in the community;
    - include a discussion of skilled versus non-skilled labour requirements of the project including availability and capacity of local workforce;
    - if applicable, describe plans and rationale for hiring short-term workers to address labour and skill shortages;
    - describe plans to encourage local employment, procurement and contracting opportunities and discuss the potential ability of local businesses to compete for project-related contracting; and
    - describe any training or education programs or scholarships the proponent is supporting to enhance employment opportunities for local residents.
- an estimate and description of direct, indirect and induced economic impact of the designated project;
- the sources and methodologies used for developing multipliers and estimates;
- where a generic multiplier may not accurately reflect the specific situation of the project being assessed, evidence should be provided of specific economic activity that will result from the project going ahead;
- a description of potential effects of changes to economic conditions in affected communities including, but not limited to:
    - forestry and logging operations;
    - commercial recreational and sport fishing, hunting, trapping;
    - commercial outfitters;
    - commercial recreation and tourism; and
    - agriculture, including predicted effects to livestock health and productivity.

- an estimate of potential changes in local employment and potential for worker shortages in certain sectors within the community as a result of the project;
- an estimate of direct, indirect, and induced income and/or wages, and the distribution of that income and/or wages, resulting from project expenditures during construction operation, and decommissioning;
- predicted effects of the project on the quality and quantity of ground or surface water used for commercial uses;
- an estimate of impacts on local, regional, provincial, territorial, federal government or Indigenous group revenues from tax levies, royalties, revenue sharing and other means during construction and operation, including a quantitative assessment of these impacts;
- a discussion of how the project would impact gross domestic product at the federal and provincial levels;
- an assessment of the net economic benefits to the Canadian economy as a whole, which requires a detailed forecast of annual cash flows for the life of the project, including a sensitivity analysis showing the impact of changes in the discount rate, prices, capital and operating costs, or other significant parameters;
- an estimate of potential effects of the project on the traditional economy, including the potential loss of traditional economies and jobs;
- an analysis of potential changes to property values; and
- an analysis of potential changes to the cost of living as a result of the project.

The Impact Statement must:

- apply GBA+ across all effects and document how potential effects of changes to economic conditions could be different for particular subgroups, including Indigenous people or other community relevant subgroups (e.g., women, youth, elders).

18. Effects to Indigenous Peoples

Proponents are encouraged to engage with Indigenous groups, in order to identify and understand the potential impacts of their projects on Indigenous peoples, and to incorporate Indigenous knowledge into the impact assessment. Engagement with Indigenous group is required to inform the impact assessment and identify measures to avoid or minimize potential impacts on Indigenous peoples from the project. This engagement may also identify potential positive outcomes, including measures that could improve the underlying baseline conditions that support the exercise of rights. This engagement should involve ongoing information sharing and collaboration between the proponent and the Indigenous groups to help validate the assessment findings. The results of any engagement should be presented in the Impact Statement, and, as best as possible should reflect the perspective of the Indigenous peoples involved.

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

Where Indigenous groups do not wish to participate, the proponent is to encouraged to continue sharing information and analysis with the Indigenous groups of the potential effects of the project, and to use available public sources of information to support the assessment.

18.1 Effects on Indigenous Peoples

The Impact Statement should provide information on how the Project may affect Indigenous peoples, as informed by the Indigenous group(s) involved. Information on measures proposed to address adverse effects should also be provided, including the perspectives of Indigenous groups on potential mitigation measures. The proponent is encouraged to apply Agency guidance on engaging with Indigenous groups and appropriate methodologies for assessing effects and impacts on Indigenous peoples and their rights.

The potential effects, to consider assessing include both adverse and positive effects to the current use of land and resources for traditional purposes, physical and cultural heritage, and environmental, health, social and economic conditions of Indigenous peoples affected by the designated project, including interferences of the project with the following:

- quality and quality of resources available for harvesting (e.g. species of cultural importance, traditional and medicinal plants;
- access to culturally important harvesting areas or resources of importance;
- experiences of being on the land (e.g. changes in air quality, noise exposure, effects of vibrations from blasting or other activities);
- current and future availability and quality of country foods (traditional foods);
- the use of travel ways, navigable waterways and water bodies;
- commercial and non-commercial fishing, hunting, trapping and gathering and cultural or ceremonial activities and practices;
- commercial, non-commercial and trade economies; and,
- cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance to groups, including, but not limited to:
- the loss or destruction of physical and cultural heritage;
- changes to access to physical and cultural heritage;
- changes to the cultural value, spirituality, or importance associated with physical and cultural heritage;
- changes to sacred, ceremonial or culturally important places, objects, or things, including languages, stories and traditions; and
- changes to visual aesthetics over the life of the project and post-project abandonment or decommissioning.

As a best practice, proponents are encouraged to also include the following:

- a description of plans to encourage employment, procurement and contracting opportunities for Indigenous peoples and communities, including training plans;
- an estimate of the anticipated levels of Indigenous economic participation in the project in comparison to the total project requirements (e.g. number of workers);
- a description of any plans for cultural sensitivity training for non-Indigenous employees to promote a safe work environment that supports the well-being of Indigenous employees;
- a description of any plans for cultural competence training for non-Indigenous employees to ensure a respectful professional relationship with Indigenous businesses; and,
- a description of how Indigenous knowledge was used in assessing environmental, health, social and economic effects to Indigenous peoples, groups and communities.

18.2 Impacts on rights of Indigenous peoples

The Impact Statement should describe the level of engagement with Indigenous groups regarding potential impacts of the project on the exercise of rights, and where possible, the project's potential interference with the exercise of rights. Where an Indigenous group has not provided this information to the proponent, or both parties agree that it is better to provide information related to the impact on the exercise of rights directly to the Government of Canada, the proponent should describe a rationale for the approach taken. Proponents are encouraged to discuss with Indigenous groups their views on how best to reflect the assessment of impacts on rights in their Impact Statement. This may include supporting Indigenous-led studies that are to be provided publicly and to the Government of Canada.

For more information on identifying and assessing impacts on the exercise of rights, please see: the *Guidance on Assessing Potential Impacts on the Rights of Indigenous Peoples under the Impact Assessment Act*.

The proponent and Indigenous groups may consider:

- how the project may contribute cumulatively to any existing impacts on the exercise of rights, as identified by the Indigenous group(s);
- the interference of the project on the quality and quantity of resources available for the exercise of rights;
- the interference of the project on the access to areas important to the exercise of rights;
- the interference of the project on the experience associated with the exercise of rights;
- the interference of the project on Indigenous traditions, laws and governance; and
- the severity of the impacts on the exercise of rights, as identified by the Indigenous group(s),

Proponents are encouraged to work together with Indigenous groups to find mutually agreeable solutions to concerns raised about a proposed project, especially for those concerns raised by Indigenous peoples about impacts on the exercise of their rights. The impact statement should detail:

- any measures identified in an attempt to avoid, minimize, offset or otherwise address potential adverse impacts of the project on the rights of Indigenous peoples.
- Where measures are proposed by Indigenous groups, the proponent should respond with its intent to implement them, as appropriate; and
- With respect to mitigation measures proposed by the proponent, the Impact Statement should include perspectives of the potentially impacted Indigenous groups, on the effectiveness of particular mitigation measures on such impacts.

Where no mitigation measures are proposed or mitigation is not possible, the Impact Statement should identify potential level of severity of the adverse impacts on the rights of Indigenous peoples, as identified by the Indigenous group(s).

Mitigation measure are further discussed in section 19, "Mitigation and Enhancement Measures".

19. Mitigation and Enhancement Measures

Every IA conducted under the IA 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 includes 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.

Mitigation and enhancement measures that are proposed are discussed during the review of the Impact Statement and may be modified as a result of the review. Mitigation and enhancement measures may be considered for inclusion as conditions in the IA decision statement. 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 possible mitigation and enhancement measures.

As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the adverse effects at the source. The proponent is also encouraged to work with the community to align project goals with an aim to enhance positive project effects. Such an approach may include the modification of the design of the project or relocation of project components.

The Impact Statement must:

- describe the standard mitigation practices, policies and commitments that constitute proven technically and economically feasible mitigation measures and that are to be applied as part of standard practice regardless of location as well as any new or innovative mitigation measures being proposed;
- describe the designated project's environmental protection plan and its environmental management system through which the proponent will deliver this plan. The plan must provide an overall perspective on how potentially adverse effects would be minimized and managed over time;
- discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs;
- describe passive and active mitigation measures that are specific to each environmental, health, social or economic effect identified. Mitigation measures are to be written as specific commitments that clearly describe how the proponent intends to implement them and the outcome these mitigation measure are designed to address;
- identify and describe mitigation measures, including alternative means of carrying out the project that would avoid or lessen potential adverse effects to terrestrial and aquatic species and/or critical habitat listed under Schedule 1 of the *Species at Risk Act*. These measures:
    - are to be consistent with any applicable recovery strategy, action plan or management plan and will also identify and describe mitigation measures to avoid or lessen adverse effects to COSEWIC-assessed species; and
    - must be described in terms of the effectiveness of each measure to avoid the adverse effect and include a comprehensive science-based rationale for proposing the selected mitigation measures.
- identify measures to prevent and mitigate the risk of engaging in harmful, destructive or disruptive activities in key sensitive periods and locations (e.g. spawning, migration and nesting) to fish or migratory birds, their nests and eggs, in water or areas frequented by fish and/or migratory birds;
- identify measures to avoid the deposit of substances harmful to fish or migratory birds in water or areas frequented by fish and/or migratory birds;
- provide best technically and economically feasible mitigation approaches to habitat mitigation that follow the hierarchy:
    - avoid potential impact;
    - minimize potential impact;
    - provide biodiversity offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized; and
    - provide justification for moving from one mitigation alternative to the next.
- provide offsetting or 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 IA process; the plans should:
    - describe the baseline condition 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 FAs, 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; and
    - identify the parties responsible for implementation, including monitoring and review.
- specify the actions, works, minimal disturbance footprint techniques, best available technology, best environmental practices, corrective measures or additions planned during the project's various phases to eliminate or reduce adverse effects;
- describe measures included in the design of the project to mitigate its GHG emissions. These could include design decisions such as the use of low-emitting technologies, the use of low-carbon or renewable fuel, electrification or carbon capture and storage;
- describe practices that will be taken to mitigate the project's GHG emissions, such as anti-idling practices for mobile equipment, leak detection and repair systems, continuous monitoring systems, or fleet optimization;
- describe information on any offset credits that have been or will be obtained, including the offset regime that issued the credits, project type, project start date and vintage year;
- provide an assessment of the likely effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the extent to which the effects are adverse must be made explicit;
- identify other technically and economically feasible mitigation measures that were considered but are not proposed for implementation, and explain why they were rejected. Justify any trade-offs between cost savings and effectiveness of the various forms of mitigation measures;
- assess any potentially adverse environmental effects associated with the mitigation method itself;
- identify and describe the use and application of best available technology and best environmental practice in identifying, assessing and implementing mitigation measures;
- identify the party responsible for the implementation of mitigation measures and the system of accountability;
- where appropriate, provide details regarding financial liability and compensation in place as required by regulation or company commitment in relation to decommissioning or abandonment;
- 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 and/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:
- 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; and
- describe whether and how these measures will be incorporated in the project design.
- identify opportunities for enhancing positive effects, such as creation of local employment and infrastructure improvements;
- describe supplier development initiatives, including identification of potential local suppliers, providing them with information about technical, commercial and other requirements, and debriefing unsuccessful bidders.
- describe any procurement policies (e.g. bid packaging) that facilitate the opportunities for local companies.
- describe education, training, 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, local employees, develop new capabilities related to project requirements; and
- describe how disproportionate effects that were identified in the GBA+ results were used to inform mitigation and enhancement measures.

Where mitigation measures for which there is little experience or for which there is some question as to their effectiveness are proposed to be implemented, the potential risks and effects should those measures not be effective must be clearly and concisely described. In addition, the Impact Statement must identify the extent to which technological innovations may help mitigate effects. Where possible, it will provide detailed information on the nature of these measures, their implementation, management and the requirements of the follow-up program.

20. Residual Effects

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 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 effect can be either qualitative or quantitative. It may be more appropriate for other effects to be described using 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.

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 the criteria above.
- provide the rationale for the choice of criteria used to determine the extent to which the predicted effects are adverse. The information provided must be clear and sufficient to enable the Agency, review panel, technical and regulatory agencies, Indigenous groups, and the public to review the proponent's analysis of effects;
- consider the views of the Indigenous groups and the public in assigning the criteria to be used and in characterizing the effects; and
- set out the probability or likelihood of that effect occurring and describe the degree of scientific uncertainty related to the data and methods used within the framework of this analysis.

21. 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 to 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 tailoring process for developing TIS Guidelines identifies and prioritizes 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, is informed and confirmed as part of the tailoring process 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.

The Impact Statement must:

- identify and provide a rationale for the VCs that will constitute the focus of the cumulative effects assessment. The selected VCs are those most likely to be affected by the project in combination with other projects and activities;
- include a rationale to justify the exclusion of other VCs from the cumulative effects assessment, as applicable;
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments may differ for each VC considered and must not be constrained by jurisdictional boundaries:
  - the cumulative effects spatial boundaries will generally be larger than the boundaries for the project effects alone, and may extend beyond Canada's jurisdiction; and
  - temporal boundaries must include an appropriate baseline and should look at all potential effects throughout the lifecycle of the project, including decommissioning and abandonment.
- identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects to each selected VC within the boundaries defined, including potential induced effects, and whose effects would act in combination with the residual effects of the project. This assessment must consider the results of any relevant regional study conducted;
- assess the cumulative effects to each VC selected by comparing the future scenarios with the project and without the project. Effects of past activities (activities that have been carried out) are to be used to contextualize the current state of the VC. This assessment must also assess the cumulative effects to rights of Indigenous peoples and cultures;
- describe the mitigation measures that are technically and economically feasible to eliminate or reduce adverse cumulative environmental, health, social and economic effects. The Impact Statement must:
  - describe and provide an assessment of the effectiveness of the measures applied to mitigate the cumulative effects; and
  - In cases where measures to mitigate these effects are beyond the control of the proponent, the Impact Statement must identify any parties that have the authority to act on these measures. In such cases, the Impact Statement must summarize any commitments by the other parties regarding implementation of the necessary measures and any associated communication plans;
- describe and, where appropriate, quantify the level and severity of the adverse cumulative effects; and
- develop a follow-up program to verify the accuracy of the assessment or the effectiveness of mitigation measures for cumulative effects.

22. Other Effects to Consider

22.1 Effects of potential accidents or malfunctions

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

The Impact Statement must:

- identify, taking into account the lifespan of different project components and contributing factors such as weather or external events, potential accidents and malfunctions related to the project, and the potential for vandalism or sabotage, including an explanation of how those potential events were identified, potential consequences (including the environmental, health, social and economic effects), the plausible worst case scenarios and the effects of these scenarios;
- identify and justify the spatial and temporal boundaries for the effect assessment associated with accidents and malfunctions. The spatial boundaries identified for effects from potential accidents and malfunctions will generally be larger than the boundaries for the project effects alone, and may extend beyond Canada's jurisdiction;
- describe the magnitude and duration of project-related accident and/or malfunction, based on operational level and shut down level events, including a description of the quantity, mechanism, rate, form and characteristics of the contaminants, greenhouse gases and other materials likely to be released into the environment during these scenarios and any potentially adverse environmental, health, social or economic effect;
- describe the safeguards that have been established to protect against such occurrences and the contingency and emergency response procedures that would be put in place if such events do occur;
- assess the potential for minor and major accidental release of fuel, or loss of dangerous goods;
- where appropriate, provide an analysis of the potential environmental, health, social and economic effects of these discharges on aquatic and terrestrial environments and on human health within spatial boundaries described for the study area;
- describe existing emergency preparedness and response systems and existing arrangements and/or coordination with the responsible response organizations in the spatial boundaries associated with the project, including exercise and training plans for emergency response;
- identify any local drinking water treatment plants or facilities that may treat water sources impacted by the project and the capacity of the drinking water treatment plant or facilities to treat water sources impacted by an accidental release from the designated project during all project phases;
- describe the role of the proponent in the case of spill, collision, grounding or other accidents or malfunctions associated with the project;
- describe mutual aid agreements in place in the event that the incident exceeds company resources and how these resources would be accessed;
- describe volunteer management plans;
- describe or provide for a waste management plan as it pertains to waste generated during an emergency response;
- where appropriate, provide details regarding financial liability and compensation in place as required by regulation or company commitment;
- describe communication and public notification plans, and public reporting;
- describe any mitigation measures that may prevent potential accidents or malfunctions; and
- describe possible mitigation measures to deal with adverse environmental, health, social and economic effects resulting from accidents or malfunctions.

22.2 Effects of the environment on the project

The Impact Statement must consider and describe how environmental conditions, including natural hazards such as severe and/or extreme weather conditions and external events (e.g. earthquakes, flooding, drought, ice jams, iceberg impacts, permafrost conditions, landslides/submarine landslides, tsunamis, volcanoes, avalanches, erosion, subsidence, fire, and outflow conditions), could adversely affect the designated project and how this in turn could result in effects to the environment, health, social and economic conditions. These events are to be considered in different probability patterns (e.g. 5-year flood vs. 100-year flood). The focus should be on credible external events that have a reasonable probability of occurrence and for which the resulting environmental effects could be major without careful management. The Impact Statement should also consider how effects of the environment on the project could have positive effects to the environment, health, social and economic conditions.

The Impact Statement must:

- provide details of planning, design and construction strategies intended to minimize the potential adverse effects of the environment on the project;
- identify any areas of potential wind or water erosion;
- describe any mitigation measures that can be implemented in anticipation or in preparation for effects of the environment on the project;
- describe possible mitigation measures to deal with adverse environmental, health, social and economic effects resulting from effects of the environment on the project;
- describe climate resilience of the project and how climate change impacts have been incorporated into the project design and planning over the lifetime of the project and describe the climate data and projections used; and
- describe measures to enhance positive environmental, health, social and economic effects resulting from effects of the environment on the project.

23. Canada's Ability to Meet Its Environmental Obligations and Its Climate Change Commitments

The Government of Canada, through the IAA, recognizes that IA contributes to Canada's understanding and ability to meet, first, its environmental obligations, and second, its commitments in respect of climate change.

In accordance with paragraph 22(1)(i) of the IAA, the Impact Statement should describe the effects of the project in the context of environmental obligations and commitments in respect of climate change, with a focus on Government of Canada obligations and commitments relevant to decision-making. The Agency will identify applicable environmental obligations or commitments in respect of climate change that will require consideration in the Impact Statement.

The type and extent of analysis could range from provision of a robust rationale to detailed analysis depending on the specifics of predicted effects and the environmental obligation or commitment in respect of climate change under consideration.

The Impact Statement should consider the need for mitigation and follow-up measures related to Canada's environmental obligations and its commitment in respect of climate change. Measures proposed to mitigate the adverse effects of a designated project may reduce a project's hindrance of an environmental obligation or climate change commitment. The implementation of mitigation or complementary measures may also result in a designated project contributing to the Government of Canada's ability to meet its environmental obligations or its commitments in respect of climate change.

The Impact Statement may also present the proponent's views on the extent to which project effects would hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change, taking into consideration proposed mitigation measures.

The proponent should refer to Agency guidance on this topic.

24. Description of the Project's Contributions to Sustainability

Sustainability, as defined in the IAA, "…means 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 planning phase, the public, Indigenous groups and stakeholders will be engaged to identify key issues of importance to them. This engagement will help identify the elements that will frame the assessment of the project's contribution to sustainability. When assessing a project's contribution to sustainability, practitioners should consider those VCs that participants characterize as important. Sustainability is contextual and project dependent; as such, it may be defined differently by communities, or even groups within communities. Furthermore, practitioners should also consider VCs:

- that could experience long-term effects;
- that may interact with other VCs;
- that may interact with potential effects of the designated project; or
- that may interact with project activities.

The Impact Statement must characterize a project's contribution to sustainability. The Impact Statement should describe the context of a particular project, including the issues of importance to participants, the diversity of views expressed and the selection of VCs.

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

- *Consider the interconnectedness and interdependence of human and ecological systems;*
- *Consider the well-being of present and future generations;*
- *Maximize overall positive benefits and minimize adverse effects of the designated project; and*
- *Apply the precautionary principle by considering uncertainty and risk of irreversible harm.*

The Impact Statement must describe how sustainability principles were applied (outlined above) and identify conclusions drawn from this analysis. This summary should be qualitative in nature, but may draw on quantitative data as necessary.

In addition, the Impact Statement must:

- indicate how the planning and design of the project, in all phases, considers the sustainability principles;
- describe the process in selecting the preferred alternative means and alternatives to the project and how the sustainability principles were considered;
- indicate how monitoring, management and reporting systems consider the sustainability principles and attempt to ensure continuous progress towards sustainability;
- describe the ecological, health, social and economic benefits of the project to local communities within the study area, potentially affected Indigenous groups, regional, provincial, territorial and/or federal governments; and
- describe engagement with potentially affected Indigenous groups and describe measures and commitments to ensuring the sustainability of Indigenous livelihood, traditional use, culture and well-being.

The proponent should refer to Agency guidance on this topic.

25. Follow-up Programs

A follow-up program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. This information may be used to determine whether additional actions are necessary (adaptive management) to address unanticipated outcomes. Adaptive management is not considered as a mitigation measure; it is a best management practice in environmental management. If the follow-up program indicates that corrective action is required, the proposed approach for managing the action must be identified and implemented. The follow-up program will explain the uncertainty of the effects outcomes and whether it is related to the IA predictions or the effectiveness of mitigation measures.

Follow-up programs are an opportunity to continue engaging with impacted Indigenous groups, and if undertaken collaboratively, can support solutions-oriented approaches to adaptive management through the early identification of issues in follow-up programs and appropriate solutions with Indigenous knowledge. 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 considerations for a follow up program.

Considerations for developing a follow-up program for environmental, health, social or economic effects, as applicable, include:

- VCs identified during the IA for which residual adverse effects are predicted or uncertain;
- the nature of concerns raised by the public and Indigenous groups about the project;
- suggestions from Indigenous groups and local communities regarding the design of, and involvement in, follow-up and monitoring programs;
- incorporation of community and Indigenous knowledge, where available;
- the accuracy of predictions;
- an evaluation of the effectiveness of mitigation measures;
- the efficacy of new or unproven techniques and technology;
- disproportionate effects highlighted by GBA+;
- the nature of cumulative effects;
- the nature, scale and complexity of the program;
- the degree of uncertainty about the effectiveness of proposed mitigation measures;
- any technically and economically feasible measures to manage effects if the applied mitigation measures do not work as intended;
- whether there was limited scientific knowledge about the effects in the IA;
- which parties will participate in the conduct of the follow-up program and reviewing its results;
- the duration of the follow-up program activities, which may vary depending on the VCs assessed;
- any existing follow-up or monitoring programs relevant to the proposed project;
- how the results of the follow-up program will be shared with interested parties; and
- triggers for adaptive management of any unacceptable or unexpected results.

Monitoring is a key component of effective follow-up programs. Monitoring can identify the potential for environmental, health, social or economic degradation during all phases of project development. Monitoring, as well, can assist in developing clearly defined action plans and emergency response procedures to account for environmental, health, social economic protection and human safety.

25.1 Follow-up program framework

The duration of the follow-up program shall be as long as required to verify the accuracy of the environmental, health, social and economic impacts predicted during the IA and to evaluate the effectiveness of the mitigation measures.

The Impact Statement must present a follow-up program that includes:

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

25.2 Follow-up program monitoring

The Impact Statement must describe the environmental, health, social and economic monitoring to be established, as part of the follow-up program.

Specifically, the Impact Statement must present an outline of the preliminary environmental, health, social and economic monitoring program, including, but not limited to the:

- identification of the monitoring activities that pose risks to the environmental, health, social and economic conditions and/or VCs and the measures and means planned to protect these conditions, including
- identification of regulatory instruments that include a monitoring requirement for the VCs;
- identification of those positions accountable and responsible for monitoring and ensuring compliance;
- description of the methodology for tracking environmental, health, social and economic issues;
- description of the methodology and mechanism for monitoring the effectiveness of mitigation and reclamation;
- description of the characteristics of monitoring where foreseeable (e.g. location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required);
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the provisions of their contracts;
- guidelines for preparing monitoring reports (number, content, frequency, format, duration, geographic extent) that will be sent to the authorities involved;
- plans, including funding options, to involve Indigenous groups and local communities in monitoring, where appropriate;
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the provisions of their contracts; and
- quality assurance and quality control measures to be applied to monitoring programs.

26. Assessment Summary

The proponent must prepare a stand-alone plain language summary of the Impact Statement in both of Canada's official languages (French and English). The summary must contain sufficient details for the reader to understand the project, any potential environmental, health, social and economic effects, potential adverse impacts on Indigenous peoples, proposed mitigation measures, residual effects and any required follow-up programs.

The Assessment Summary provides an opportunity for the proponent to demonstrate correspondence between issues raised during the planning phase and issues addressed in the assessment. This Assessment Summary should be presented by VC, which allows the proponent to demonstrate the completeness of the assessment and provide the results of the analysis. The summary must include key maps or figures illustrating the project location and key project components.

Part 3 – Licensing Requirements of the Canadian Nuclear Safety Commission

The Canadian Nuclear Safety Commission (CNSC) requires the submission of a licence application with sufficient information to meet the requirements of the *Nuclear Safety and Control Act* (NSCA) and associated regulations.

The CNSC's licensing process may include the issuance of a licence for the following stages:

- Site preparation
- Construction
- Operation
- Decommissioning
- Abandonment

Applicants are required to determine which stages are to be considered (e.g. site preparation and construction) in their licence application as part of the integrated review. Subsequent licence applications and decisions related to the subsequent licence will be made through the CNSC licensing process.

The regulatory requirements that must be addressed for each stage of licensing are provided in the NSCA and its regulations. These regulations include the following:

- General Nuclear Safety and Control Regulations
- Radiation Protection Regulations

- Radiation Protection Regulations
- Class I Nuclear Facilities Regulations
- Class II Nuclear Facilities and Prescribed Equipment Regulations
- Uranium Mines and Mills Regulations
- Nuclear Substances and Radiation Devices Regulations
- Packaging and Transport of Nuclear Substances Regulations, 2015
- Nuclear Security Regulations
- Nuclear Non-proliferation Import and Export Control Regulations
- Canadian Nuclear Safety Commission Cost Recovery Fees Regulations

Regulatory requirements are also contained in CNSC regulatory documents located on the CNSC website at http://www.nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/index.cfm.

Where information requirements overlap between the NSCA and IAA (e.g., environmental protection), the applicant may provide appropriate cross-referencing in the documentation. The applicant will clearly indicate where the requirements of both the NSCA and IAA are addressed.

It is recommended that the applicant contact the CNSC as soon as the applicant has enough information from preliminary activities to determine whether it is a designated project under the IAA. Early communication can help the applicant develop a good understanding of:

- regulatory requirements;
- licensing process; and
- information that must be included in a licence application

Additional information related to the CNSC's regulatory framework is available on the CNSC website at: http://www.nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-framework/index.cfm.

Appendix 1 – Resources and Guidance

Engagement

CNSC's REGDOC-3.2.2, Indigenous Engagement. Published February 2016

Human Health

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

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

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

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

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

*Health Canada's Risk Assessment Guidance Parts I through VII a*vailable at https://www.canada.ca/en/health-canada/services/environmental-workplace-health/contaminated-sites/guidance-documents.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.

Water Quality

Guidelines for the Assessment of Alternatives for Mine Waste Disposal available at https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/guidelines-alternatives-mine-waste-disposal.html. Compiled by Environment and Climate Change Canada

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

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 and Climate Change Canada. Technical Report Series Number 508

Bird Survey Inventories in Canada. Available at (http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=B944A67D-1). Compiled by Environment and Climate Change Canada

Wetlands

Canadian Wetland Classification System. Developed by the National Wetlands Working Group. Available at http://www.wetlandpolicy.ca

Wetland Ecological Functions Assessment: An Overview of Approaches. Prepare by Alan Hanson et al. Available at http://publications.gc.ca/site/eng/343283/publication.html). Environment and Climate Change Canada. 2008.

Species at Risk

COSEWIC Status Reports. Developed by the Committee on the Status of Endangered Wildlife in Canada. Available at: https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html

Nuclear

CSA Group, CSA N288.1-14, Guidelines for calculating derived release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities, Update No.1, March 2014

CSA Group, CSA N288.4-10, Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills, Update No.2, May 2015

CSA Group, CSA N288.5-11, Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills, May 2010

CSA Group, CSA N288.6-12, Environmental risk assessment at Class I nuclear facilities and uranium mines and mills, June 2012

CSA Group, CSA N288.7-15, Groundwater protection programs at class I nuclear facilities and uranium mines and mills, June 2015

CSA Group, CSA N288.8-17, Establishing and implementing action levels to control releases to the environment from nuclear facilities, February 2017

CSA Group, CSA N294-09 (Reaffirmed 2014), *Decommissioning of Facilities Containing Nuclear Substances*, Update No.1, August 2014

Footnotes

Footnote 1

> This template uses 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*.
>
> Return to footnote 1 referrer

Footnote 2

> As set out in paragraph18(1)(b) of the Impact Assessment Act.
>
> Return to footnote 2 referrer

Footnote 3

> Gender Based Analysis Plus (GBA+) provides a framework to describe the full scope of potential adverse and positive effects under the proposed IAA. 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.
>
> Return to footnote 3 referrer

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Top of page