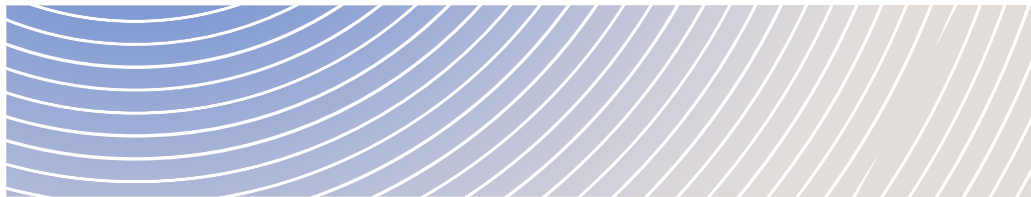


Upper Beaver Gold Project



TAILORED IMPACT STATEMENT GUIDELINES PURSUANT TO THE *IMPACT ASSESSMENT ACT*

APRIL 20, 2022

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Abbreviations and Short Forms

Term	Definition
the Act	Impact Assessment Act
the Agency	Impact Assessment Agency of Canada
BAT/BEP	Best Available Technologies / Best Environmental Practices
BCRs	Bird Conservation Regions
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
COPC	Contaminant of Potential Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
FA	Federal Authority
GBA Plus	Gender Based Analysis Plus
the Guidelines	Tailored Impact Statement Guidelines
GHG	Greenhouse gas



HHRA	Human Health Risk Assessment
LSA	Local Study Area
Minister	Minister of Environment and Climate Change
NAAQO	National Ambient Air Quality Objective
OCAP	Ownership, Control, Access and Possession
OHWM	Ordinary High Water Mark
PA	Project Area
PAH	Polycyclic aromatic hydrocarbons
Registry	Canadian Impact Assessment Registry
RSA	Regional Study Area
SARA	Species at Risk Act
SACC	Strategic Assessment of Climate Change
the Template	Tailored Impact Statement Guidelines Template
VC	Valued component
VOC	Volatile organic compound

1. Introduction

The federal impact assessment 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). The Agency uses the proponent's Impact Statement and other information received during the impact assessment process to prepare an impact assessment report. At the end of the impact assessment process, the decision made is whether the potential adverse effects within federal jurisdiction, and the adverse direct or incidental effects, are in the public interest. Under section 2 of the *Impact Assessment Act* (the Act), the effects within federal jurisdiction are defined as:

- a) a change to the following components of the environment that are within the legislative authority of Parliament:
 - (i) fish and fish habitat, as defined in subsection 2(1) of the *Fisheries Act*,
 - (ii) aquatic species, as defined in subsection 2(1) of the [*Species at Risk Act*](#),
 - (iii) migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*, and
 - (iv) any other component of the environment that is set out in Schedule 3;
- b) a change to the environment that would occur
 - (i) on federal lands,
 - (ii) in a province other than the one where the physical activity or the designated project is being carried out, or
 - (iii) outside Canada;
- c) with respect to the Indigenous peoples of Canada, an impact — occurring in Canada and resulting from any change to the environment — on
 - (i) physical and cultural heritage,
 - (ii) the current use of lands and resources for traditional purposes, or
 - (iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
- d) any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada; and
- e) any change to a health, social or economic matter that is within the legislative authority of Parliament that is set out in Schedule 3 of the Act.

And the direct or incidental effects are defined as effects that are directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of a physical activity or designated project, or to a federal authority's provision of financial assistance to a person for the purpose of enabling that activity or project to be carried out, in whole or in part.

The public interest determination must be based on the impact assessment report from the Agency or a review panel and consider the factors set out in section 63 of the Act:

- a) the extent to which the Project contributes to sustainability;
- b) the extent to which the adverse effects within federal jurisdiction and the adverse direct or incidental effects that are indicated in the impact assessment report in respect of the Project are significant;
- c) the implementation of the mitigation measures that the Minister or the Governor in Council, as the case may be, considers appropriate;
- d) the impact that the Project may have on any Indigenous peoples and any adverse impact that the designated project may have on the rights of the Indigenous peoples¹ of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*; and
- e) the extent to which the effects of the Project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change.

A key element for the impact assessment process is the preparation of Tailored Impact Statement Guidelines² (the Guidelines), which provide the proponent with directions and requirements for the preparation of an Impact Statement. The Guidelines for the Upper Beaver Gold Project (the Project) proposed by Agnico Eagle Mines Limited (the proponent), were tailored by the Impact Assessment Agency of Canada (the Agency) during the planning phase of the impact assessment. The tailoring was based on the nature, complexity and context of the Project, and was informed and guided by consultation and engagement with the proponent, the public, Indigenous communities, federal authorities (FAs), and provincial ministries.

1.1. Factors to be considered in the impact assessment

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

- a) the changes to the environment or to health, social or economic conditions and the positive and negative consequences of these changes that are likely to be caused by the

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

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

carrying out of the designated project, including:

- i. the effects of malfunctions or accidents that may occur in connection with the designated project;
 - ii. any cumulative effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out; and
 - iii. the result of any interaction between those effects.
- b) mitigation measures that are technically and economically feasible and that would mitigate any adverse effects of the designated project;
 - c) the impact that the designated project may have on any Indigenous group and any adverse impact that the designated project may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*;
 - d) the purpose of and need for the designated project;
 - e) alternative means of carrying out the designated project that are technically and economically feasible, including through the use of best available technologies, and the effects of those means;
 - f) any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;
 - g) Indigenous knowledge provided with respect to the designated project;
 - h) the extent to which the designated project contributes to sustainability;
 - i) the extent to which the effects of the designated project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change;
 - j) any change to the designated project that may be caused by the environment;
 - k) the requirements of the follow-up program in respect of the designated project;
 - l) considerations related to Indigenous cultures with respect to the designated project;
 - m) community knowledge provided with respect to the designated project;
 - n) comments received from the public;
 - o) comments from a jurisdiction that are received in the course of consultations conducted under section 21 of the Act;
 - p) any relevant assessment referred to in sections 92, 93 or 95 of the Act;
 - q) any assessment of the effects of the designated project that is conducted by or on behalf of an Indigenous governing body and that is provided with respect to the designated project;
 - r) any study or plan that is conducted or prepared by a jurisdiction—or an Indigenous governing body not referred to in paragraph (f) or (g) of the definition *jurisdiction* in section 2 of the Act—that is in respect of a region related to the designated project and that has been provided with respect to the Project;
 - s) the intersection of sex and gender with other identity factors; and
 - t) any other matter relevant to the IA that the Agency requires to be taken into account.

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

1.2. Gender-based analysis plus (GBA Plus)

For consideration of the intersection of sex and gender with other identity factors (paragraph 22(1)(s) of the Act), the Guidelines will refer to Gender-based Analysis Plus (GBA Plus). GBA Plus is an analytical process that can guide practitioners to identify who is impacted by a project and assess how they may experience impacts differently, in order to develop mitigation measures to address these differential impacts. These Guidelines refer to "diverse subgroups" in the context of GBA Plus, in reference to groups within the general population and within communities (e.g. by sex, gender, age, ethnicity, Indigeneity, socio-economic status, health status and any other community-relevant identify factors). The Agency's Guidance: Gender-Based Analysis Plus in Impact Assessment provides guiding principles and tools to apply GBA Plus in the Impact Statement.

To support GBA Plus, the information provided in the Impact Statement must:

- be sufficiently disaggregated to support the analysis of disproportionate effects as per the GBA Plus. As much as possible, the data must be disaggregated (e.g. by sex, gender, age, ethnicity, Indigeneity, ability, and any other community-relevant identify factors) and presented distinctly for each specific subgroup;
- describe how community and Indigenous knowledge from affected populations, including community developed indicators and locally collected data, was used in establishing baseline conditions and informing effects assessments;
- describe how community members differ in access to resources, opportunities and services;
- describe the circumstances in which diverse subgroups could suffer more adverse effects or receive fewer benefits related to the Project than others, and how they may respond differently to potential effects; and
- describe mitigation or enhancement measures to address these differential effects.

Quantitative information, including gender sensitive data, should be complemented by qualitative insights from studies or consultations, and other sources. The description of effects should be based on both data collected and concerns expressed through engaging with the affected Indigenous communities and community members.

1.3. Preparing the Impact Statement

In the preparation of the Impact Statement, the proponent must adhere to relevant ethical guidelines and cultural protocols governing research, data collection and confidentiality. This is

particularly important in the case of information gathered and studies conducted with diverse subgroups. The proponent must respect the obligation of protecting personal information and adopt the established standards for the management of Indigenous data (e.g. the [First Nations Principles of Ownership, Control, Access and Possession](#) (OCAP) or standards adopted by an Indigenous community) and disaggregated data from small or unique populations.

The proponent may present the information in the Impact Statement in the manner it deems most appropriate. While the Guidelines do not prescribe a preferred structure for the Impact Statement, it is recommended to follow a structure similar to the Guidelines in order to facilitate the review of the Impact Statement and participation in the process. In order to facilitate the review of the Impact Statement, the proponent must provide a table of concordance that indicates where each requirement of the Guidelines is addressed.

The Impact Statement must address all requirements outlined in the Guidelines. Where the proponent is of the opinion that particular information is not required, it should contact the Agency to confirm the rationale for not including it prior to submitting the Impact Statement. The rationale for not including the information must also be provided in the Impact Statement. The proponent should also notify the Agency of any changes made to the Project as originally proposed in the Detailed Project Description that may result in a different set of effects and may require a reconsideration of information requirements.

The Agency is available to support the proponent during the preparation of the Impact Statement and may establish technical advisory groups, consisting of FAs and others, as appropriate. In order for the Agency to support the proponent, the proponent must provide a work plan for activities within the Impact Statement phase to be validated by the Agency. The proponent is also encouraged to engage the Agency early in the process to clarify requirements and expectations as presented in the Guidelines. The proponent should also consider submitting documents for review (e.g. proposed study plans for baseline and effects assessment studies for VCs such as fish and fish habitat, surface water and ground water quality and quantity, geochemistry, air quality, noise and vibrations, human health, economic; draft sections of the Impact Statement) prior to submitting the formal Impact Statement. The proponent is encouraged to submit study plans to the Agency in advance of technical meetings to facilitate discussions with FAs and others, as appropriate. Active engagement will support early identification and resolution of issues.

The Agency will review the submitted Impact Statement, and will engage with FAs, jurisdictions, Indigenous communities and other participants to identify any deficiencies in the information provided, in comparison to the Guidelines, which the proponent must address. When the Agency is satisfied that the proponent has provided it with all of the required information or studies, it will post a notice on the Canadian Impact Assessment Registry (the Registry). The proponent must provide the Agency with the information or studies within three years after the day on which a copy of the Notice of Commencement is posted on the Registry. The time limit will include the time required for the review of the Impact Statement and for the proponent to address any deficiencies. On the proponent's request, the Agency may extend the time limit by any period that

is necessary for the proponent to provide the Agency with the information or studies. If the proponent does not provide the Agency with the information or studies within the three year time limit, or within any extension of that time limit, the impact assessment is terminated.

1.4. Format and accessibility

The impact assessment must be based on information that is publicly accessible, within the limitations of confidentiality and ethical constraints, such as in relation to Indigenous and community knowledge, business confidential information, and intellectual property. The proponent must provide a summary for the documents that served as key references in the Impact Statement that are not otherwise publicly accessible, or consider appending them to the Impact Statement. Any information provided by the proponent in the Impact Statement must be in machine-readable, accessible format.

Where information is required or is provided as a map in the Impact Statement, the proponent must also provide the Agency with the corresponding electronic geospatial data file(s). The Agency will make the geospatial data files available to the public under the terms of the [Open Government License – Canada](#). Geospatial data files must include metadata that is compliant with the ISO 19115 standard and, at a minimum, provides:

- Title;
- Abstract or summary of what is contained in the data file;
- Source of the data;
- Date of creation for the data;
- The point of contact and originator; and
- Confirmation that there are no restrictions or limitations on sharing the data.

The proponent should review the Agency's [Guidance on submitting geospatial data](#) for more information.

The proponent should curate all data collected and analyses performed in such a way that it may be made available to participants or the Agency upon request. The Agency may require specific data sets to support review of the Impact Statement or for the impact assessment.

The proponent should be prepared to provide:

- all biophysical survey data in a well-documented data file which provides information on the site, site visits and individual observations or measurements (georeferenced where possible);
- individual results of all laboratory analysis, including methods, standards or references followed, detection limits, controls, and quality assurance and control procedures;
- socioeconomic data in a well-documented data file;
- input and output data from modeling; and



- documentation and results of analysis that allow for a clear understanding of analytical methods and for replication of results.

These requirements will 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 Registry and the Government of Canada'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.

2. Proponent Information

2.1. The proponent

The Impact Statement must:

- provide contact information for proponent representatives for the Project (e.g. name, address, phone, 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, including roles and responsibilities of key personnel;
- 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.

2.2. Qualifications of individuals preparing the Impact Statement

In support of transparency, the Impact Statement must:

- provide information on the individuals who prepared the sections within the Impact Statement; and
- demonstrate that qualified individuals have prepared the information or studies. Where possible, the proponent should use experts who are members of a professional body or recognized association.

A qualified individual would include someone who may be relied on by the proponent to provide advice within their area of expertise, as demonstrated by

- formal education, training or certification;
- experience in relevant area; and
- credibility or standing as a holder of Indigenous or community knowledge.

The Agency also expects proponents to demonstrate scientific integrity in their preparation and delivery of Impact Statements by

- following existing standards and best practices for the responsible conduct of scientific research;



- declaring and managing any real or perceived conflict of interest for individuals involved in preparing the Impact Statement;
- eliminating, controlling for, or appropriately managing potential biases; and
- characterizing all potential sources of scientific uncertainty, including their magnitude and any differences in the interpretation of scientific results.

Proponents are expected to demonstrate their adherence to these methods and processes within their Impact Statement. For example, it is expected that proponents provide information on data collection methods, sources of information and knowledge, and the completeness of the data provided, including any identified gaps and the nature of these gaps. Furthermore, proponents are expected to identify how they have responded to scientific uncertainty and potential bias in their Impact Statement.

3. Project Description

3.1. Project overview

The Impact Statement must describe the Project, key project components and ancillary activities, scheduling details, the timing of each phase of the Project, the total lifespan 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.

3.2. Project location

The Impact Statement must describe the Project's location, the geographical setting and the 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 other 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 or for a linear project, provide the beginning and end points;
- project footprint, including the extent of the tenure;
- surface areas, location and spacing of project components;
- distance of the project components to any federal lands and the location of any federal lands within the regional study area;
- services and infrastructure and current land and aquatic uses in the area including:
 - roads;
 - municipalities and administrative regions;
 - resource development projects already underway in the study area (e.g. mines and forestry operations); and
 - local businesses and industries such as fisheries and outfitters, and any other relevant uses;
- primary, secondary and tertiary watersheds, as per the [Ontario Watershed Boundaries](#);
- all waterbodies, including intermittent and ephemeral streams, and their location on a map, as well as flow direction;
- navigable waterways;
- landcover in the area, including important or critical habitats;

- ecozones, ecoregions, and ecodistricts as per the province's or Canada's Ecological Land Classification³;
- environmentally sensitive areas, such as national, provincial, and regional parks, ecological reserves, ecologically and biologically sensitive or significant areas, wetlands, 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 community and Indigenous communities;
- Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, First Nations Reserve lands, Indigenous harvesting regions (with permission of Indigenous communities); and
- culturally important features of the landscape to Indigenous communities and the public.

3.3. 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;
- legislative or regulatory requirements 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 Act that has powers, duties or functions in relation to the environmental effects of a project;
- federal or provincial greenhouse gas (GHG) legislation, policies or regulations that will apply to the Project, in accordance with the [Strategic Assessment of Climate Change](#) (SACC);
- government policies, resource management plans, planning or study initiatives relevant to the Project and/or the impact assessment and their implications, including relevant regional studies, regional assessments and strategic assessments;
- any treaty, self-government, land claims or other agreements between federal or provincial governments and Indigenous communities that are pertinent to the Project and/or the impact assessment;
- any relevant land use plans, land zoning, or community plans;
- information on land lease agreement or land tenure, when applicable; and

³ [Introduction to the Ecological Land Classification \(ELC\) 2017](#) and [Ecozones Introduction by Canadian Council on Ecological Areas](#).

- municipal, regional, provincial and/or national objectives, standards or guidelines, by-laws or ordinances that have been used by the proponent to assist in the evaluation of any predicted environmental, social or economic effects or other impacts, with implications for health effects.

3.4. Project components and activities

The Impact Statement must:

- describe 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 their rights. Examples of project components that may be considered in this description are outlined in [Appendix 1 - List of Project Components](#);
- describe project activities to be carried out during each project phase, with a focus on activities with the greatest potential to have environmental, health, social and economic effects, or impacts on Indigenous people and their rights. Examples of project activities that may be considered in this description are outlined in [Appendix 1 - List of Project Activities](#);
 - describe the location, methods used, schedule (including expected sequence, start date, time of year, duration and frequency), magnitude and scale of each project activity;
 - highlight activities that involve periods of increased disturbance to environmental, health, social and economic conditions, or impacts on Indigenous peoples;
- provide a summary of any change made to the Project as originally proposed in the Detailed Project Description, including the reasons for these changes;
- provide sufficient detail to support analysis regarding the Project's impacts in the context of potential interaction between valued components (VCs);
- detail how input from diverse subgroups was used to identify potential components or activities of concern;
- describe how input from Indigenous communities and/or the public influenced project components, such as the location of the new cottage access road; and
- include maps of key project components, boundaries of the proposed site with geographic coordinates, major existing infrastructure, proponent lands, and leased properties or lands, adjacent resource lease boundaries, jurisdictional boundaries, adjacent land uses and any important environmental features.

In addition to describing the project components and activities, the Impact Statement must also describe the following:

- dewatering of York Lake;

- construction, operation and decommissioning of the Misema River diversion (e.g. diversion channels, dykes, etc.);
- construction or changes to public access roads; shipment of gold doré and copper concentration off-site;
- changes to existing infrastructure (i.e. expansion, operation, decommissioning, etc.) for the purpose of the Project; and
- progressive site reclamation considering continued use of project infrastructure.

If applicable, describe the following components and activities:

- transportation of any incoming ore to be processed at the project's mill from other mine sites, including sources, volumes and location;
- transportation of ore from the project site to be processed at other local mills, including sources, volumes and location;
- construction of infrastructure for off-site ore transported to site for processing (i.e. temporary stockpiles) including associated water management facilities;
- use of project infrastructure to process ore from off-site deposits;

3.5. Workforce requirements

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

- opportunities for employment outlining the anticipated number of full-time and part-time positions to be created, and time line for when they will be created. Positions should be presented using the National Occupational Classification system;
- anticipated workforce region of origin (i.e. local, regional, out-of-province or international employees);
- the skill and education levels required for the positions;
- anticipated hiring policies and programs;
- investment in training opportunities;
- working conditions and anticipated work scheduling for construction and operation (e.g. hours of work, rotational schedules);
- workplace policies and programs for Indigenous employment, and employment of other underrepresented groups;
- workplace policies and programs, including codes of conduct, workplace safety programs and cultural training programs; and
- employee assistance programs and benefits programs.



Workforce requirements must take GBA Plus into consideration. The information must be presented in sufficient detail to analyse how historically excluded or underrepresented groups will be taken into account, including Indigenous communities and other relevant diverse subgroups.

4. Project Purpose, Need and Alternatives Considered

The proponent must identify the purpose of and need for the Project. The proponent must also analyze alternatives to the Project and alternative means of carrying it out. The proponent should consult the Agency guidance documents [Guidance: "Need for", "Purpose of", "Alternatives to" and "Alternative Means"](#) and [Policy Context: "Need for", "Purpose of", "Alternatives" and "Alternative Means"](#)

4.1. Purpose of the Project

The Impact Statement must outline what is to be achieved by carrying out the Project. The Impact Statement should broadly classify the Project (e.g. mineral extraction and processing) and indicate the target market(s) (e.g. international, domestic, local), where applicable. The *purpose of statement* should include any objectives the proponent has in carrying out the Project. The proponent is encouraged to consider the perspectives of participants (i.e. public, Indigenous communities, governments) in establishing objectives that relate to the intended effect of the Project on society.

4.2. 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 information provided should make it possible to reasonably conclude that there is an opportunity or issue that warrants a response and that the proposed project is an appropriate approach.

The description must include:

- supporting information that demonstrates the need for a project;
 - any comments or view of Indigenous peoples, the public and other participants on the proponent's need statement; and
 - description of the recycling potential for gold and copper, and its implications on the need for the Project.
-

4.3. Alternatives to the Project

The Impact Statement must provide a description of the alternatives to the Project that are technically and economically feasible to meet the Project need and achieve the project purpose, from the perspective of the proponent. The process of identifying and considering alternatives to the Project must consider the views, information and knowledge from Indigenous communities potentially impacted by the Project and other participants, as well as existing studies and reports.

The Impact Statement must present a rationale for selecting the proposed project over other options, which includes how sustainability principles (described in section [17 - Extent to which the Project contributes to sustainability](#)) were considered. 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 Act.

4.4. Alternative means of carrying out the Project

The Impact Statement must identify and consider the potential environmental, health, social, cultural and economic effects and the impacts on the rights of Indigenous peoples of alternative means of carrying out the designated project that are technically and economically feasible.

For the selection of the alternative means of carrying out the Project, 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;
- those alternative means that are technically and economically feasible presented in sufficient and appropriate detail; and
- the particularities for each alternative means and their potential adverse and positive environmental, health, social and economic effects, and their impacts on the rights of Indigenous peoples as identified by Indigenous peoples.

The Impact Statement must then describe:

- the methodology and criteria that were used to compare the alternative means, to determine the preferred means of carrying out the Project, and to justify the exclusions of other solutions, based on the trade-offs associated with the preferred and other alternative means;
 - environmental criteria should include effects to air quality, water quality and quantity, fish and fish habitat, wildlife and associated habitat (including wetlands), risk from accidents and malfunctions;
 - potential effects to species at risk as per the [Species at Risk Act](#) (SARA), including any critical habitat, must be considered in alternative assessment, including a description of how avoidance of effects was considered and how it may be achieved through alternative means of carrying out the Project or alternatives to the Project;

- potential impacts of the alternatives on GHG emissions and how GHG emissions were considered as a criterion in the alternative's selection (refer to section 4.1.3 of the SACC);
- the preferred means of carrying out the Project and the rationale for the selection based on the consideration of environmental, health, social and economic effects, the impacts on the rights of Indigenous peoples, technical and economic feasibility, and the use of best available technologies, and consideration of the sustainability principles (described in [Section 17 - Extent to which the Project contributes to sustainability](#));
- application of GBA Plus to the analysis of alternative means of carrying out the Project to inform how effects may vary for diverse subgroups; and
- how concerns, views and information provided by Indigenous peoples, the public and other participants were taken into account in establishing criteria and conducting the analysis.

In its alternative means analysis, the Impact Statement must address key project elements, including, but not limited to, the following, where relevant to the Project:

- route or corridor and means options for transportation (e.g. transportation of ore on-site and off-site);
- route or corridor and means options for linear project components (e.g. transmission lines, access roads (including public access roads));
- energy sources to power the project site and other stationary sources to provide heat or steam to the Project;
- project site and/or component locations;
- tailings storage facility, including:
 - alternative types (e.g. dry stack facility or conventional slurry facility, co-deposition, re-use as backfill underground, in-pit disposal, etc.); and
 - location of the tailings storage facility in consideration of groundwater and groundwater flow directions, local groundwater users, as well as nearby rivers, lakes and wetlands.
- water and wastewater management including:
 - location of effluent discharge points;
 - treatment technologies and techniques to control effluent quality.
- waste rock management, including:
 - options for short to long term management of waste rock;
 - acid mine rock drainage, neutral metal mine drainage, and/or metal(loid) leaching potential of all excavated materials; and
 - selection of methods for waste rock management.
 - diversion and realignment of the Misema River including:

- conducting the Project without diversion of the Misema River or draining of York Lake (i.e. without an open pit);
- design of the diversion structures (diversion channels and dykes).
- conducting the Project without water-crossings on Victoria Creek;
- conducting the Project without affecting the boat launch access;
- waste management; and
- construction alternatives;
- location, construction and crossing methods for waterbodies, watercourses, wetlands and other obstacles;
- suspension, abandonment or decommissioning options (including storage and disposal of mine equipment)
- mining-related activities:
 - mining operations, including the following scenarios:
 - open pit and underground mining operations;
 - underground mining operations without open pit;
 - 8-hour or 12-hour operations;
 - 24-hour operations;
 - operating on lower daily volumes
 - processing facilities location and design (e.g. comminution, separation, concentration and dewatering); and
 - mine waste management facilities (tailings, waste rock, overburden, low-grade ore, effluent).

For mine waste management-facilities an assessment of alternatives 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 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 — that is in respect of a region related to the Project and that has been provided with respect to the Project;
- any relevant assessment of the effects of the designated project that is conducted by or on behalf of an Indigenous governing body and that is provided with respect to the designated project;
- Indigenous knowledge, community knowledge, comments received by the public, comments received from a jurisdiction; and
- other studies or assessments realized by the proponent or other proponents.

5. Description of Public Participation and Views

The proponent must engage with local communities and stakeholders. Engagement activities should be inclusive and ensure that interested members of the public have an opportunity to share their views. They should also consider the language needs, with regards to both official languages and Indigenous languages spoken in the region, of the people being engaged. Particular attention must be paid to the engagement of individuals, communities, and organizations that have rights and interests in the lands affected by the proposed project.

The proponent should consult Agency guidance documents on this topic, particularly: [*Framework: Public Participation Under the Impact Assessment Act*](#), and [*Guidance: Public Participation under the Impact Assessment Act*](#).

5.1. Summary of public engagement activities

The Impact Statement must describe the proponent's public engagement activities regarding the Project, including;

- a record of engagement undertaken, that describes all efforts, successful and unsuccessful, to seek the views of the public with respect to the designated project;
- efforts made to distribute project information and the information and materials that were distributed during the consultation process;
- methods used, where consultations were held, the persons, organizations and diverse subgroups consulted;
- efforts made to involve the public in the development and revision of the proponent's Impact Statement; and
- efforts to engage diverse subgroups of the community to support the collection of information needed to complete the GBA Plus.

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

The Impact Statement must:

- provide a summary of key issues related to the Project, including the potential environmental, health, social and economic effects and potential for disproportionate effects for diverse



subgroups within the population, that were raised through engagement with the public, and how they were incorporated into the Impact Statement;

- describe any questions and comments raised by the public and how they influenced the design, of the Project;
- identify the alternative means, mitigation measures or the monitoring and follow-up programs identified to deal with public uncertainties;
- identify public concerns that have not been addressed, if any, and provide the reasons why they have not been; and
- 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.

6. Description of Engagement with Indigenous Communities

The proponent must engage with Indigenous communities at the earliest reasonable opportunity, in order to identify and understand the potential impacts of the Project on Indigenous peoples and their rights, including their lands, territories and resources, and to incorporate Indigenous knowledge into the impact assessment. Engagement with Indigenous communities is required to inform the impact assessment and identify measures to avoid or minimize potential impacts on Indigenous peoples and their rights 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. The proponent will demonstrate how, the Project will be designed not only in such a way as to avoid and/or minimize its negative effects, but also to maximize its positive impact on the quality of life of Indigenous peoples.

As part of an impact assessment process under the Act, the proponent must collaborate with Indigenous communities in completing its Impact Statement. For the purposes of the Impact Statement, the proponent must:

- in accordance with any existing community protocols and/or guidance provided by the Agency, collect available Indigenous knowledge and expertise and integrate it into its Impact Statement, just as it integrates scientific knowledge;
- share project information frequently and transparently with Indigenous peoples;
- support the participation of Indigenous communities in the completion of the Impact Statement, which could include funding studies conducted by potentially affected Indigenous communities who will have demonstrated interest in this regard;
- cooperate with Indigenous communities to identify preferred mitigation measures to avoid, minimize, offset or otherwise accommodate for potential adverse impacts on Indigenous peoples or their rights, as well as to optimize the Project's benefits for their communities.

The engagement efforts should be consistent with the Government of Canada's commitment to implement the United Nations Declaration on the Rights of Indigenous Peoples (the Declaration) as a comprehensive international human rights instrument and Canada's roadmap for reconciliation. The Declaration emphasizes the importance of recognizing and upholding the rights of Indigenous peoples and ensuring that there is effective and meaningful participation of Indigenous communities in decisions that affect them, their communities, and territories. The Declaration also emphasizes the need to work together in partnership and respect, as articulated through the principle of free, prior and informed consent. This principle reflects working together in good faith on decisions that impact Indigenous peoples, with the intention to achieve consensus.

Engagement should also be consistent with jurisprudence and best practices in respect of implementing the common law duty to consult. The [*Indigenous Engagement and Partnership*](#)

Plan identifies Indigenous communities that the Crown will consult with to understand the concerns and potential impacts of the Project on their exercise of potential or established Aboriginal or Treaty rights and, where appropriate, make accommodations. The degree of engagement with each community will vary and in general, will be proportionate to the evidence provided by Indigenous communities regarding potential pathways of impact from the Project on Aboriginal or treaty rights. Engagement is also conducted for other purposes, including as an opportunity to learn about and further explore Indigenous community interests in a project, or to understand other potential project effects not directly related to the exercise of Aboriginal or treaty rights. At a minimum, the proponent must engage with the Indigenous communities identified⁴ by the Crown in the *Indigenous Engagement and Partnership Plan*. For Indigenous communities identified in Section 4.2 of the *Indigenous Engagement and Partnership Plan*, to be notified of the Project at key milestones of the impact assessment process, the proponent must provide project updates at these times and document the notifications in the Impact Statement. In order to facilitate the participation of each Indigenous community in the development of the Impact Statement, the proponent is required to work with each Indigenous community named in section 4 of the *Indigenous Engagement and Partnership Plan* to establish a mutually agreed approach to their participation, should they wish to participate.

If the proponent becomes aware of potential adverse effects on an Indigenous community that is not listed in section 4.1 of the *Indigenous Engagement and Partnership Plan*, that community must also be engaged, as outlined above and the proponent is required to notify the Agency as soon as they have the opportunity to do so.

Engagement with Indigenous communities must involve ongoing information sharing and collaboration between the proponent and Indigenous communities to contribute to the development and validation of conclusions and assessment findings related to potential impacts and pathways of effects to Indigenous peoples and impacts on the rights of Indigenous peoples. The results of any engagement with each Indigenous community must be presented in the Impact Statement, and, as best as possible, convey the perspective of the Indigenous communities being engaged. The record of engagement and inclusion of Indigenous knowledge in the Impact Statement should demonstrate that the proponent sought to build consensus and obtained the agreement from specific Indigenous communities regarding information pertaining to those Indigenous communities presented in the Impact Statement.

The Agency notes that not all Indigenous communities may be willing to collaborate with the proponent, therefore the proponent must demonstrate they have made best efforts at collaboration, and provide the Agency with an explanation regarding circumstances where collaboration was not possible. The proponent should continue sharing information and analyses

⁴ The list of Indigenous peoples, groups or communities identified during the planning phase may change as knowledge of the effects and potential impacts of the Project is gained, or if the Project or its components are modified during the impact assessment. The Agency reserves the right to modify the list in the *Indigenous Engagement and Partnership Plan* based on additional information gathered during the impact assessment and will notify the proponent.

with the Indigenous communities, to use publicly available sources of information to support the assessment, and to document their efforts in that respect.

The proponent must consult the Agency's guidance documents on Indigenous participation and engagement throughout the Impact Statement, which are available on the Agency's website and are listed in [Appendix 2 – Indigenous engagement resources](#).

6.1. Indigenous knowledge considerations

Indigenous knowledge⁵ is holistic and when integrated in impact assessment, it informs the assessment on areas including the biophysical environment, as well as social, cultural, economic, and health aspects, Indigenous governance, resource use, and mitigation. Indigenous knowledge should be brought together on equitable footing with scientific or technical aspects to inform the impact assessment including the environmental, health, social, economic and rights assessments and best practices and mitigation. It is important that Indigenous knowledge, where available to the proponent, be included for all of these aspects in the impact assessment, not only to look at potential impacts of the Project on Indigenous communities. It is also important to capture the context in which Indigenous communities provide their Indigenous knowledge and to convey it in a culturally appropriate manner.

Community-specific engagement protocols and procedures around Indigenous knowledge in assessment processes should be understood, respected, and implemented. The Impact Statement must indicate where input from Indigenous communities, including Indigenous knowledge, has been incorporated and how it was considered. Information should be specific to the individual Indigenous community(ies) involved in the assessment, and describe contextual information about the members within an Indigenous community (e.g. women, men, elders and youth).

The proponent must indicate where Indigenous knowledge that was provided was not included in the assessment and provide a rationale.

Indigenous knowledge, whether publicly available or directly shared with the proponent, should not be included without written consent and validation from the Indigenous community, regardless of the source of the Indigenous knowledge. The guidance document [Protecting Confidential Indigenous Knowledge under the Impact Assessment Act](#), to which the proponent must refer, describes the approaches to be favoured. Appropriate, culturally-based Indigenous methodology for integrating Indigenous knowledge and community input into the impact

⁵ The Government of Canada recognizes that Indigenous Peoples refer to their knowledge in different ways, characteristic of their unique languages. Within the context of these Guidelines, the term Indigenous knowledge is used to refer to all Indigenous ways of knowing. The proponent is encouraged to respect the terminology preferences of the Indigenous communities involved in the assessment.

assessment is necessary to appropriately and ethically assess potential effects and significance of those effects from an Indigenous perspective.

6.2. 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 community 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.

The purpose of this engagement is to gain an understanding of the issues and concerns of potentially affected Indigenous communities, and to inform an assessment of the potential adverse impacts of the Project on Indigenous peoples and their rights.

The record of engagement in the Impact Statement must include:

- the proponent's Indigenous engagement policy, as well as established policies and stated principles related to the collection of traditional knowledge and traditional land use information;
- the list of Indigenous communities engaged by the proponent, including those that the proponent was unsuccessful in engaging;
- the list of Indigenous communities wishing to be engaged but omitted by the proponent from engagement and the reasons for their omission;
- where applicable, a copy of each community-specific engagement plan developed collaboratively by the Indigenous community and the proponent for the Project. If only one engagement plan was developed solely by the proponent for engagement with all Indigenous communities, provide a rationale for this approach;
- the engagement activities undertaken with each Indigenous community, including the date, means and results of engagement;
- a description of the outcomes of conversations with each Indigenous community about how they wish to be engaged by the proponent;
- the results of any engagement and the perspectives of the Indigenous peoples involved;
- the list of the consultation or engagement protocols adopted by each Indigenous community, if applicable. A copy of the protocols must be included when available in writing;
- an explanation for cases where engagement efforts have proven unsuccessful;
- a description of how project information is frequently and transparently shared with Indigenous peoples;
- a description of the preferred methods for sharing information, including alternative solutions implemented for people and locations where technological resources are limited or language

barriers exist (i.e. translation of written documents or provision of summaries in plain language, or Indigenous languages);

- a description of how Indigenous communities were provided with an reasonable opportunity to review draft sections of the Impact Statement prior to them being filed, where disagreements occurred, and how disagreements were considered;
- a description of how Indigenous expertise will be sought to assist with the carrying out of the Project, should it be approved;
- a description of efforts to engage diverse segments of each Indigenous community in culturally appropriate ways, including groups identified by gender, a age or other community relevant factors (e.g. hunters, trappers, and other harvesters) to support the collection of information needed to complete the GBA Plus;
- a description of how engagement activities by the proponent were intended to ensure Indigenous communities were provided an opportunity to evaluate the Project's potential positive and negative effects and impacts on their members, communities, activities, and rights, as identified by the Indigenous community(ies); and
- any agreements pertaining to engagement that are finalized or in progress, with anticipated timelines to complete.

The record of engagement must demonstrate that the capacity needs of Indigenous communities were taken into account, and that timelines were adequately communicated and flexible enough to ensure Indigenous communities had the ability to review and gain understanding of information in the Impact Statement, including, where applicable, specific procedures for contributing information for sections of the Impact Statement. It is expected that the engagement activities for the preparation of the Impact Statement will be carried out with integrity and transparency, without conflicts of interest, in good faith, and conducted in a manner that is attentive to the concerns of Indigenous communities and committed to producing mutually beneficial outcomes.

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

The Impact Statement must provide an analysis of any potential effects and impacts to Indigenous peoples and of all the input received from Indigenous communities with respect to the Project, including its contribution to cumulative effects. This analysis is to include all Indigenous knowledge and input received by Indigenous communities prior to, and since commencing, the impact assessment process. This analysis should serve to inform the identification of potential effects and impacts on any applicable VCs, impacts on Indigenous peoples and their rights, and proposed measures to mitigate or accommodate for adverse impacts, enhance or optimize positive effects.

The analysis may be summarized in the relevant section on effects to a VC. The location and level of detail of the information in the Impact Statement will depend on its importance to the selected VCs.

It is recommended that the proponent organize and analyze information relevant to Indigenous communities in separate sections for each one potentially affected by the Project, either by nation, community, or other grouping based on the preference expressed by those people. Where applicable, the information and analysis must also be sufficiently disaggregated to support the GBA Plus analysis of disproportionate effects. In all cases, ethical guidelines and culturally appropriate protocols governing research, data collection and confidentiality must be followed.

The Impact Statement must:

- consider and incorporate Indigenous knowledge, spiritual practices, cultural beliefs, laws and norms in the assessment, including whether the Project would be inconsistent with Indigenous laws and norms;
- describe the type of information received from Indigenous communities (observations, questions, issues, comments, knowledge, expertise or other);
- describe the potential effects and impacts to environmental, health, social, cultural and economic conditions of each Indigenous community, informed by the Indigenous community(ies) involved in the assessment and must include both adverse and positive effects;
- describe the rights or interests of each Indigenous community, that the groups themselves have identified, that may be impacted by the Project;
- describe the potential effects and impacts to lands in a reserve within the meaning of subsection 2(1) of the *Indian Act*. Note that section 2 of the Act defines federal lands as including “reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and that are subject to the *Indian Act*, and all waters on and airspace above those reserves or lands”;
- provide an analysis of the extent of the potential effects on each Indigenous community, and the views of Indigenous communities regarding the extent of impact on the exercise of rights as well as how these effects or impacts may be avoided, managed, mitigated, or accommodated;
- detail the main issues, questions and comments raised by each Indigenous community during engagement activities and the proponent’s responses, including how matters have been addressed in the Impact Statement or will be addressed in the future;
- append any specific studies or assessments provided by Indigenous communities, if permission has been obtained from the Indigenous community concerned to publish them;
- identify the sources of information used in the analyses of potential impacts to rights, as well as assumptions and methodologies used for the analyses;

- integrate the perspectives of Indigenous youth, women, two-spirited people, individuals with disabilities, and Elders where provided;
- indicate where and how Indigenous communities' Indigenous knowledge, perspectives and input were integrated into or contributed to decisions regarding the Project or its impact assessment, including:
 - the construction, operation, decommissioning, closure and reclamation plans
 - the evaluation of alternatives to the Project, and alternative means of carrying out the Project;
 - developing the assessment including setting spatial and temporal boundaries, identifying and selecting VCs and collection of baseline information;
 - characterization of potential environmental, health, social and economic effects of the Project for each Indigenous community;
 - measures to mitigate effects or to enhance or optimize potential project benefits, including compensation and offset plans as listed in [Appendix 1 – Compensation and offset plans](#);
 - follow-up and monitoring activities as well as adaptive management strategies should the Project proceed; and
 - describe how the information gathered during the Planning Phase of the impact assessment of the Project was included, including the documents uploaded to the Registry by Indigenous communities during that phase of the impact assessment.

6.4. Collaboration with Indigenous peoples following the submission of the Impact Statement

The proponent must explain in the Impact Statement how it plans to continue to work with affected Indigenous peoples during subsequent phases of the impact assessment process and throughout the lifecycle of the Project, if it is allowed to proceed. For this section, the proponent may refer to information presented in other sections of the Impact Statement.

The Impact Statement must:

- describe the type of work the proponent intends to accomplish with Indigenous communities during subsequent phases of the impact assessment process;
- set out any proponent commitments for engaging affected Indigenous communities, where appropriate;
- describe how Indigenous peoples will be involved in decision making processes related to the Project throughout the lifecycle of the Project; and
- describe how Indigenous expertise and knowledge would be considered in carrying out the Project.

7. Assessment Methodology

7.1. Baseline methodology

The Impact Statement must provide a description of the baseline for the environmental, health, social, and economic conditions related to the Project. This should include the existing environmental, health, social and economic conditions, interrelations and interactions among them, and the variability in these conditions over time scales and spatial boundaries appropriate to the Project. Meaningful, two-way dialogue with communities and Indigenous communities provides input that may describe how environmental, health, social and economic conditions are interrelated.

Baseline data must be collected in a manner to allow for reliable analysis, extrapolation and predictions. The proponent will be responsible for collecting the data, establishing appropriate data governance, and performing reliable analysis, extrapolation and predictions. The baseline data should be suitable to estimate pre-project baseline conditions, to predict effects from the Project, and to evaluate post-project changes in the conditions within and across the project, local and regional study areas. Further data requirements are included in the specific baseline conditions sections for biophysical environment (section 8), for the health, social, economic conditions (Section 9) and for impacts on Indigenous peoples (section 10) in the Guidelines.

Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to. This is particularly important in the case of information gathered and studies conducted with vulnerable subgroups (e.g. analysis of gender-based violence). The proponent must respect the obligation of protecting personal information and adopt the established standards for the management of Indigenous data (e.g. the First Nations principles of Ownership, Control, Access and Possession (OCAP) or standards adopted by an Indigenous community).

For all baseline conditions, the Impact Statement must:

- describe the current baseline for the environmental, health, social, and economic conditions related to the Project and the interrelations and interactions among them;
- describe potential changes in the baseline conditions that are likely to occur in the future, if the Project was not carried out, including changes due to future climate change;
- include current baseline data, and clearly demonstrate that these data have been collected in a way that makes analyses, extrapolations and reliable predictions possible, and are suitable to estimate pre-project baseline conditions, to predict effects from the Project, and to evaluate post-project changes in the conditions within and across the project, local and regional study areas;

- provide detailed descriptions of data sources and data collection methods, including sampling, survey and research protocols, modeling methods (including details of modelling software used (program and version), and model tuning or parameterization), sources of uncertainty, error estimates, any assumptions or biases, and an explanation of why these are the most appropriate sources and methods for the Project;
- describe modelling methods and include assumptions, calculations of margins of error, and other relevant statistical information. Models should be validated using field data from the appropriate local and regional study areas;
- show that the data sources are relevant to and representative of conditions within the established spatial and temporal boundaries and account for natural variability, especially if surrogate data from representative sites are used rather than specific measurements at the project site;
- indicate if baseline data gaps exist and additional steps taken to address gaps in information;
- describe where and how community or Indigenous knowledge, Indigenous participation and input were considered in determining baseline conditions (e.g. sampling locations, collection of baseline data, and opportunity to review results) on topics such as air quality, water quality, tissue sampling, fish and fish habitat, species at risk, and moose;
- describe how GBA Plus was applied to examine differences in baseline conditions among diverse subgroups and provide disaggregated data where necessary; and
- describe how any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments, such as the Strategic Assessment of Climate Change, were considered in determining baseline conditions.

Proponents are encouraged to consult with the Agency during the development and planning of baseline studies. Relevant sources of baseline information are listed in [Appendix 1 - Sources of baseline information](#).

7.2. Selection of valued components

The Impact Statement must identify the valued components (VCs) that will serve as the focal points for the impact assessment. VCs consists of components that are of particular concern or value to participants and that may be affected by the Project. The value of a component not only relates to its role, but also to the value people place on it.

The Guidelines, in sections 8-13, provide information requirements organized in categories that may be considered as VCs, or may be considered as intermediate components to inform the assessment of VCs, depending on the Project. The VCs will help to organize the description of the effects of the Project required by the Guidelines. In some sections, the Guidelines identify specific sub-VCs (e.g. specific fish species within fish and fish habitat). The proponent may also identify additional VCs beyond those included in the Guidelines in consultation with Indigenous communities and other participants.

Indigenous communities may identify holistic VCs that encompass the effects on a number of individual environmental, health, social, or economic value components. Where identified, the proponent should structure analysis and presentation of individual VC into an assessment of the overarching Indigenous VC. Proponents are encouraged to work with Indigenous communities to identify holistic VCs, which may increase the efficiency of the assessment and clarity of presentation. In the event that a VC is suggested by an Indigenous community but is excluded from the Impact Statement, the proponent must provide a justification for its exclusion.

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

- VC presence in the project area, local study area and regional study area;
- the extent to which the effects of the Project and related activities have the potential to interact with the VC;
- the extent to which the VC may be affected by other past, existing or future projects and activities and natural processes;
- the extent to which the VC is linked to Indigenous interests or rights of Indigenous peoples and whether an Indigenous community has requested the VC;
- the extent to which the VC is linked to a federal, provincial, or municipal government priority;
- the possibility that an adverse or positive effect on the VC would be of particular concern to Indigenous communities, the public, or federal, provincial, municipal or Indigenous governments;
- information from any ongoing or completed regional or strategic assessment processes; 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 Impact Statement must:

- describe the VCs and provide a rationale for the selection of VCs in sufficient detail to allow the reviewer to understand their relevance to the assessment;
- indicate the source and reasons of the concerns or interests considered in the selection of VCs, including from the public, provincial or federal authorities, Indigenous communities, and other participants;
- describe how community and Indigenous knowledge and the perspectives were considered in selecting VCs.

Based on comments from participants during the Planning phase, the following components have been raised as important to consider in the assessment, but it is not exhaustive:

- air quality (i.e. potential for increased wind dispersal of project contaminants due to other forestry activities in the area);

- surface water quality and quantity (e.g. existing contamination in the Misema River system and its adjacent lakes; and Blanche River, Englehart River and Lake Timiskaming);
- groundwater quality and quantity;
- cultural heritage;
- current use of lands and resources for traditional purposes by Indigenous peoples;
- Indigenous peoples' health and mental well-being;
- social conditions, including use of land and resources for recreational purposes;
- fish and fish habitat;
- wetlands;
- birds, including:
 - raptors, such as hawks, eagles, falcons;
 - waterfowl, such as ducks, geese, swans;
 - waterbirds, such as loons, gulls, terns;
 - marshbirds, such as grebes, rails, herons;
 - shorebirds, such as sandpipers, plovers, snipes;
 - forest birds, such as warblers, vireos, thrushes;
 - other landbirds, such as owls, swallows, kingfishers; and
- provincial parks in the area surrounding the Project;
- species at risk listed under the federal [*Species at Risk Act*](#).

Concerns and interests pertaining to these components have been considered in the Guidelines and are reflected in the information requirements. The proponent is expected to finalize the selection of VCs in consultation with Indigenous communities and other participants. The proponent should engage with participants and refer to comments received in relation to the Project on the Registry for additional information to support the selection of VCs.

7.3. Spatial and temporal boundaries

The Impact Statement must establish appropriate spatial and temporal boundaries to describe the baseline conditions for, and to guide the assessment of, each VC. The spatial and temporal boundaries will vary depending on the VC and must be considered separately for each VC.

The proponent must engage with Indigenous communities, and is encouraged to engage with relevant non-Indigenous communities, when defining spatial and temporal boundaries for VCs that are identified by, or related directly to, Indigenous peoples. The Impact Statement must explain how the proponent considered the information received from Indigenous communities in

its definition of spatial and temporal boundaries, particularly for VCs related to effects to Indigenous peoples.

The proponent should consider additional guidance for assigning appropriate study areas or boundaries provided in [Appendix 1 - Establishing Spatial and Temporal Boundaries](#).

7.3.1. Spatial boundaries

Generally, it is recommended that the proponent establish three spatial boundaries of study areas to assess the impacts on each VC:

- Project Area (PA): defined as the project footprint including all temporary and permanent areas associated with the Project, and alternatives considered;
- Local Study Area (LSA): defined as the area beyond the project footprint where project effects may extend;
- Regional Study Area (RSA): defined as the larger area around the LSA, (delineated by ecological, social, economic or other appropriate boundaries) including the region where cumulative effects may extend.

The Impact Statement must:

- describe the spatial boundaries for each VC and provide a rationale for each boundary. Spatial boundaries must be shown on maps;
- define spatial boundaries by taking into account:
 - scale and spatial extent of potential effects and impacts of the Project;
 - the physical location of potential receptors, including, where applicable, the movement patterns of potential receptors;
 - relationships between VCs (e.g. interaction between wildlife and vegetation);
 - community knowledge and Indigenous knowledge;
 - current or traditional land and resource use by Indigenous communities;
 - rights of Indigenous peoples, including treaty lands, traditional territories and areas or sites used for cultural and spiritual practices;
 - physical, technical, ecological, social, health, economic and cultural considerations; and,
 - size, nature, location and known effects of past, present and foreseeable projects and activities, particularly for the regional study areas;
 - any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments; and
- identify where spatial boundaries may extend to areas that are (i) on federal lands, (ii) in a province other than the one where the physical activity or the Project is being carried out, or (iii) outside Canada where effects are expected.

7.3.2. Temporal boundaries

The Impact Statement must:

- describe the temporal boundaries for each VC and provide a rationale for each boundary;
- define temporal boundaries by taking into account:
 - schedule of phases of the Project;
 - past conditions and historical context;
 - community knowledge and Indigenous knowledge;
 - current or traditional land and resource use by Indigenous communities;
 - rights of Indigenous peoples, including treaty lands, traditional territories and areas or sites used for cultural and spiritual practices;
 - relevant physical, technical, ecological, social, health, economic and cultural considerations;
 - timing of past, present and foreseeable projects and activities;
 - how continued ore processing from other mine sites after the ore from the Upper Beaver deposit has been depleted could potentially extend ore processing operations on-site beyond the life of the Upper Beaver Mine; and
 - any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments.

7.4. Effects assessment methodology

The Impact Statement must describe the changes to the environment or to the health, social or economic conditions and the positive and negative consequences of these changes (the effects) that are likely to be caused by the carrying out of the Project, and the results of interactions among the effects. This includes the effects to Indigenous peoples' physical and cultural heritage, current use of lands and resources for traditional purposes, any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada.

The overall effects assessment methodology must also consider the Project's potential interference with the exercise of rights of the Indigenous peoples of Canada as further detailed in section [10](#). The description must include the information requirements detailed in specific effects sections in the Guidelines.

The assessment of effects must be based on a comparison of baseline conditions and the predicted future conditions with, and without, the Project, in order to account for changes that may result from, for example, changes to the socio-economic conditions or changes due to potential future climate change. The assessment of effects should also provide the probability or

likelihood of that effect occurring, and the degree of confidence in the analysis. The assessment of effects must use methods that are statistically and scientifically defensible and must describe the degree of uncertainty related to the data and methods used and reflect community and Indigenous knowledge if it is available.

After considering the technically and economically feasible mitigation measures (see section [7.5 - Mitigation and enhancement measures](#)), the Impact Statement must describe any residual environmental, health, social or economic effects of the Project. The assessment of residual effects must also take into account interactions between the Project and past, existing and reasonably foreseeable projects or physical activities to be carried out, as described in section [7.6 - Cumulative effects assessment](#).

Depending on the VC, the description of the effects can be either a qualitative or quantitative, taking into account any important contextual factors, as appropriate. The Impact Statement may describe the effects in terms of magnitude, geographic extent, timing, duration and frequency, and whether effects are reversible or irreversible. For some effects, it may be more appropriate to use other criteria, such as the nature of the effects, directionality, causation and probability. The ecological and socio-economic context should also be provided. The perception of the same effect may vary among different individuals, groups and communities. Consequently, the effect assessment should take into account views and concerns expressed through engagement with Indigenous peoples and community members.

The Impact Statement must:

- describe in detail the Project's potential direct and indirect, adverse and positive effects for each phase of the Project;
- identify and describe measures that are technically and economically feasible and that would mitigate the Project's adverse effects or enhancements to increase positive effects (see section [7.5 Mitigation and enhancement measures for more details](#));
- describe any residual effects of the Project;
- describe the effects falling within federal jurisdiction as defined in section 2 of the Act;
- in a stand-alone section or appendix, describe effects that are directly linked or necessarily incidental to the exercise of a federal authority's power or performance of a duty or function that would permit the Project to be carried out, in whole or in part;
- describe how baseline data was used to inform this analysis;
- describe the analytical methods selected to assess effects, including clearly stated assumptions for all predictions and how each assumption has been tested, including clear definitions of any descriptors or criteria that are used;
- describe the degree of uncertainty related to the data and methods;

- for quantitative predictions based on models, detail model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained, including an explanation of model calibration, validation and model performance metrics used;
- discuss the degree of confidence in the predictions and conclusions of the effect assessment;
- if a detailed description of effects cannot be provided, provide a rationale for the absence of details and a general description of the potential effects and related project activities (e.g. activities and effects related to closure and reclamation). The proponent should confirm the rationale with the Agency before submitting the Impact Statement;
- for predictions that may be affected by climate change, discuss how the range of potential climates informed the assessment, including predicted changes in climate extremes;
- consider and describe the interactions among the environmental, health, social and economic effects and impacts on Indigenous peoples and their rights;
- consider and describe the perspectives, concerns and tolerance levels of Indigenous communities and other participants;
- describe where and how Indigenous and community knowledge and input were considered and incorporated into effects assessment;
- describe how GBA Plus was applied to examine differences in effects among diverse subgroups and provide disaggregated data where necessary, and
- describe how any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments were considered in the effects assessment.

7.5. Mitigation and enhancement measures

The Impact Statement must identify measures that are technically and economically feasible and that would mitigate the Project's adverse environmental, health, social and economic effects. The proponent may also identify enhancement measures to increase positive effects, such as local and regional training efforts, investment in infrastructure and services, and projects to rehabilitate degraded environments.

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.

For more guidance on developing mitigation measures see [Appendix 1 - Developing Mitigation Measures and Enhancements](#).

The Impact Statement must:

- describe mitigation measures that specifically address the adverse effects to environmental, social, economic and health conditions identified in the effects assessment including:
 - mitigation practices, policies and commitments that are part of the project design and that are required to achieve the predicted effects (e.g. project design elements that were accounted for in the effects assessment);
 - 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;
 - any new or innovative mitigation measures being proposed;
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on diverse subgroups, or so 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;
- write mitigation measures as specific commitments that clearly describe how the proponent intends to implement them and the desired outcomes. Measures are to be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation;
- identify and describe the use and application of best available technology and best environmental practice in identifying, assessing and implementing mitigation measures;
- describe any environmental protection plan(s) for the Project and, if applicable, the environmental management system through which the proponent will deliver this plan. The plan(s) must provide an overall perspective on how potentially adverse effects would be minimized and managed over time;
- identify the party responsible for the implementation of mitigation measures and the system of accountability;
- discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with any commitments;
- describe the approach that would be taken if a mitigation measure is no longer feasible while the Project is carried out;
- describe how, throughout the Project's duration, the lessons learned through follow-up programs will be used to continually improve mitigation measures;
- where components are to be decommissioned and abandoned, include planned activities to do so. Project components that may be abandoned and decommissioned during the construction or operation phases may include access roads, temporary laydown areas, aggregate extraction sites and other temporary sites;
- where appropriate, describe financial liability and compensation in place as required by regulation or by the proponent's commitments, in relation to decommissioning or abandonment;

- document specific suggestions raised by Indigenous communities for avoiding, mitigating or otherwise accommodating the Project's environmental, health, social and economic effects, including potential effects and impacts on Indigenous peoples 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;
- 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; and
- where appropriate, describe any adaptive management plans that will be implemented to address uncertainties associated with the effectiveness of mitigation measures included in a follow-up program (see section 15.4) including:
 - identifying the expected outcomes and targets that the Adaptive Management Plan will address;
 - describing the uncertainties that the Adaptive Management Plan will address;
 - developing hypotheses aimed at reducing the uncertainties described above;
 - describing the relevant baseline(s) for the Adaptive Management Plan;
 - describing mitigation measures to be employed and alternatives.

For each mitigation measure identified, the Impact Statement must:

- provide an assessment of the anticipated effectiveness and resulting residual effects; to the extent possible, provide relevant information to demonstrate anticipated mitigation effectiveness, including technical information from analogous projects and projects in the region, peer-reviewed studies, and local Indigenous and community knowledge;
- describe all relevant uncertainties and assess how they could affect predicted residual effects;
- if there is little experience or some question as to the effectiveness of any measures, describe the potential risks and effects should those measures not be effective or malfunction;
- for those mitigation measures intended to address effects 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 communities regarding the residual effects;
- assess any potentially adverse environmental effects associated with the mitigation method itself; and

- describe how disproportionate effects that were identified in the GBA Plus results were used to inform mitigation and enhancement measures.

In addition to the general requirements above, additional requirements and recommended mitigation measures are shown in the specific mitigation sub-sections that follow. The proponent may propose measures that differ from the specific requirements and recommendations. In which case, the proponent must provide a rationale. For example, the proponent could propose measures viewed as better suited to the anticipated effects than those listed in the Guidelines.

7.6. Cumulative effects assessment

The proponent must assess the Project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative effects. The proponent should consult the Agency guidance [*Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act \(2012\)*](#). The best practices described in this document also apply to the assessment of cumulative effects under the Act, as applicable.

Cumulative effects are defined as changes to the environment, health, social, cultural, and economic conditions, as a result of the Project's residual effects combined with the effects of other past, existing and reasonably foreseeable projects and physical activities. Cumulative effects may result if:

- the implementation of the Project may cause residual adverse effects to the VC; and
- the same VC has been or can be affected by other past, existing or future projects or physical activities.

A cumulative effect on an environmental, health, social or economic component or an Indigenous community or the rights of Indigenous peoples may be important even if the Project's incremental effects to these components by themselves are minor. Activities from the Project itself that generate multiple emissions and discharges (e.g. simultaneous operations) may also need to be considered in the cumulative effects analysis to understand synergistic, compensatory, masking or additive effects.

The Impact Statement must:

- identify the VCs that will be subject to the cumulative effects assessment, including:
 - VCs for which the proponent anticipates residual effects from the Project (must be considered in the cumulative effects assessment);
 - VCs identified as being of particular concern in the context of cumulative effects by the public and by Indigenous communities;
 - VCs where the predicted residual effects might not indicate the need for a cumulative effects assessment, but rely heavily on uncertain mitigation measures;

- VCs for which cumulative effects were identified as a concern during the Planning phase, including:
 - air quality (i.e. potential for increased wind dispersal of project contaminants due to other forestry activities in the area);
 - surface water quality and quantity, and sediment quality (e.g. existing contamination in the Misema River system and its adjacent lakes; and Blanche River, Englehart River and Lake Timiskaming);
 - groundwater quality and quantity;
 - physical and cultural heritage, and to any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
 - current use of lands and resources for traditional purposes by Indigenous peoples;
 - Indigenous peoples' health and mental well-being;
 - social conditions, including use of land and resources for recreational purposes;
- include a rationale if VCs are excluded from the cumulative effects assessment;
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected, taking into account:
 - boundaries may differ for each VC and should not be constrained by jurisdictional boundaries;
 - spatial and temporal boundaries will generally be larger than the boundaries for the project effects alone, and may extend beyond Canada's jurisdiction;
 - temporal boundaries should account for potential effects throughout the lifecycle of the Project, including decommissioning and abandonment;
 - spatial and temporal boundaries for VCs related to effects and impacts on Indigenous peoples defined in collaboration with the Indigenous communities concerned;
- identify the sources of potential cumulative effects on environmental, health, social, or economic components. Specify which other projects or activities that have been or will be carried out that could have resulted or could result in effects on the selected VCs within the defined boundaries and whether those effects could interact with the residual effects of the Project. Clearly explain and justify the rationale for selecting other past, existing or future projects or activities to include in the cumulative effects assessment. Project activities to be considered include, but are not limited to:
 - past, existing or future mining activities or projects;
 - mineral exploration activities at the proposed project site;
 - future mining activities resulting from the merger with Kirkland Lake Gold;
 - hydroelectric developments in the Misema River;
 - forestry, infrastructure, energy projects, and other industrial activities;

- consider the results of any relevant regional studies or regional assessments;
- describe how the selection of boundaries and other past, existing or future projects or activities for cumulative effects assessment were informed by consultations with the public, Indigenous peoples, jurisdictions, federal authorities and other participants.
- assess the cumulative effects for each selected VC;
 - the analysis must include the effects of past, existing and foreseeable future projects and physical activities in combination with the residual effects of the Project, taking into account how the effects may interact (additive, synergistic, compensatory, and masking effects);
 - the analysis of the effects of future projects and physical activities must include a comparison of possible future scenarios with and without the Project, but must reflect the full range of cumulative effects and not just the Project's contribution;
 - the effects of past and existing projects and physical activities can be used to put the current state of the VC into context, but must be included in the cumulative effects analysis;
 - cumulative effects for the same VC may need to be assessed using a hierarchy, e.g. effects on local populations of certain species and on the larger populations;
- describe technically and economically feasible mitigation measures proposed for cumulative environmental, health, social and economic effects, as well as potential impacts on the rights of Indigenous peoples, including:
 - an assessment of the effectiveness of the measures applied to mitigate the cumulative effects;
 - in cases where measures to mitigate these effects are beyond the control of the proponent, 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;
- assess the regional implications of applying project-specific mitigation and enhancement measures, taking into account any reasonably foreseeable development in the area; and
- develop a follow-up program to verify the accuracy of the assessment and the effectiveness of mitigation measures for cumulative effects (see section [15-Follow-up programs](#)).

The cumulative effects assessment must include consideration of cumulative effects in relation to the ability of Indigenous peoples to exercise their rights and culture. Both the content and means of presenting this information is to be developed in consultation with each potentially impacted Indigenous community. Proponents must collaborate with Indigenous communities in assessing the cumulative effects of the Project on the rights and interests of Indigenous peoples. If Indigenous communities do not wish to participate in the cumulative effects assessment, the proponent should continue sharing information and analyses with the Indigenous communities, to use publicly available sources of information to support the assessment, and to document their efforts in that respect.

7.7. Extent to which effects are significant

For adverse effects within federal jurisdiction and the adverse direct or incidental effects, as defined in section 2 of the Act, the Impact Statement must:

- characterize the residual effects, even if deemed small or negligible, and cumulative effects, using criteria and language most appropriate for the effect;
- consider using the following criteria for residual effects, as appropriate:
 - magnitude;
 - geographic extent;
 - timing;
 - duration;
 - frequency;
 - reversibility; and
 - the environmental, health, social and economic context within which potential effects may occur.
- Context should be described and applied as part of the key criteria above, for example:
 - the sensitivity and importance of affected aquatic and terrestrial species, including species at risk and species of importance for Indigenous peoples;
 - the sensitivity and importance of affected habitats and their functions for wildlife;
 - the existence of standards, guidelines, tolerance levels and other sources of information to assess effects; and
 - the potential for disproportionate residual effects for diverse subgroups as per the GBA Plus;
- describe the extent to which the adverse effects within federal jurisdiction and the adverse direct or incidental effects are significant;
- describe the extent to which the adverse cumulative effects within federal jurisdiction, and the adverse direct or incidental effects, are significant;
- justify the approach and choice of criteria used to determine the extent to which the effects are significant;
- define and provide justification for any qualitative or quantitative categories, benchmarks, thresholds, or other descriptors used to characterize the extent to which effects are significant prior to conducting the effects assessment;
- identify and explain relevant sources of information that were used to characterize the extent to which those effects are significant, including how the perspectives, concerns and tolerance levels of Indigenous communities and other participants were considered; and



- describe how the probability or likelihood of that effect occurring and the degree of scientific uncertainty related to the data and methods used in the effect assessment, where considered in determining the extent of significance.

The information provided must be clear and sufficient to enable the Agency, Indigenous communities, and other participants to evaluate the proponent's characterization of residual effects and the analysis of the extent to which effects are significant.

The best practices described in the Agency's technical guidance document for [Determining whether a designated project is likely to cause significant adverse effects under the Canadian Environmental Assessment Act, 2012](#) may be considered for the characterization of residual effects in the context of the Act, as applicable.

8. Biophysical Environment

In describing effects to 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 within the ecosystem using scientific, community and Indigenous knowledge. 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, but are not limited to: patterns and connectivity of habitat patches, continuation of key natural disturbance regimes, structural complexity, hydrogeological patterns, nutrient cycling, abiotic-biotic and biotic interactions, population dynamics, genetic diversity, and Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.

The presence of endangered ecosystems, rare, limited and/or significant habitat (e.g., federal, provincial, or Indigenous protected areas, wildlife sensitivity maps, RAMSAR sites, identified or proposed critical habitat in recovery strategies or action plans) potentially affected by the Project should be included the description of the biophysical baseline conditions. The following must be included in relevant sections of the biophysical environment both in written description and on maps:

- primary, secondary and tertiary watersheds as per the [Ontario Watershed Boundaries](#);
- waterbodies and watercourses, including intermittent and ephemeral streams;
- wetlands;
- ecozones, ecoregions, and ecodistricts as per the province's or Canada's Ecological Landscape Classification (see [Introduction to the Ecological Land Classification \(ELC\) 2017](#)).

8.1. Meteorological environment

The Impact Statement must:

- describe the local and regional climate, in sufficient detail to highlight weather variations and characteristics of the regions affected by project activities and components, including historical records of relevant meteorological information;
- provide summary data and the reference to underlying data source, including unique weather stations identifiers for:
 - monthly mean, maximum and minimum temperatures;
 - monthly mean, maximum and minimum precipitation;

- typical wind speed and direction;
- monthly mean evapotranspiration estimates using standard meteorological measurement (e.g. using the Penman, Morton or Meyer Methods);
- provide reference to sources (and unique weather station identifiers) for hourly meteorological data (wind speed and direction, air temperature, dew point temperature or humidity, air pressure and precipitation data) from a minimum of one year to support dispersion modelling that captures the normal variability of meteorological conditions; and
- describe the influence of climate change on the local and regional climate and in the risks of extreme weather events.

8.2. Geology, geological hazards, and geochemistry

8.2.1. Baseline conditions

The Impact Statement must:

- describe the geology of the bedrock and unconsolidated sediments at an appropriate scale for the Project, including a table of geological descriptions, geological maps and cross-sections at the appropriate scale;
- identify on geological maps the location of areas of bedrock outcrops that will require blasting;
- identify the geological zones likely to contain asbestos fibres;
- describe the geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components,
- 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;
 - evidence of active faults;
 - isostatic rise or subsidence; and
 - history of landslides, slope erosion and the potential for ground and rock instability/landslides, and subsidence during and following project activities;
- provide a characterization of instabilities caused by historical mining activities;
- provide a geochemical characterization of expected mined materials, such as waste rock, ore (including off-site), low grade ore, pit wall materials, underground development ramps, tailings, overburden and potential construction material (i.e. mine rock, quarries, unconsolidated material);
- provide a detailed summary of analytical methods used to evaluate mineralogy, acid rock drainage and metal(loid) leaching. The Mine Environment Neutral Drainage (MEND) report 1.20.1 is recommended as guidance to support study design;

- describe the representativeness of samples collected for acid rock drainage and metal(loid) leaching assessment. Present cross sections or block model maps at an appropriate scale that include mine rock samples, geology, mineralized zones, the approximate location of all open pit and underground mine development, borehole traces and identification numbers, and a scale and legend;
- describe the representativeness of tailings solids and process water. Provide a schematic process flow chart including the location that each tested sample represents if various processing streams are tested. In addition to considerations listed for mine rock, consider cyanide and its degradation products in the analytical testing program.
- describe the quality assurance/quality control procedures and data. Provide laboratory certificates of analysis that include information related to analytical methodology and quality assurance/quality control;
- describe the approach and methods for the prediction of acid rock drainage and metal(loid) leaching. Provide initial leaching potential results based on short term leach tests and a description of the representativeness of laboratory and field kinetic tests based on static tests results; and
- describe baseline concentrations of contaminants of concern (these may include but are not limited to selenium, sulphate, cadmium, nitrate and calcite, and heavy metals) within the local study areas, regional study area as required, and downstream receiving environments.

8.2.2. Effects to geology, geological hazards and geochemistry

The Impact Statement must describe all effects of the Project on geology, geological hazards, and geochemistry including:

- describe potential effects of the Project in areas of geological instability caused by historical mining activities;
- assess different methods of segregating potentially-acid generating and/or metal(loid) leaching and non-potentially acid generating waste materials during the Project's life cycle, if required for construction materials or separate waste management; and
- describe potential effects to groundwater and surface water and sediment quality from acid rock drainage, neutral mine drainage, and/or metal(loid) leaching, as described in Section 8.5.2.

8.3. Topography, soil and sediment

8.3.1. Baseline conditions

The Impact Statement must:

- describe the terrain, soils and sediments within the local and regional study areas. Provide surficial geology maps and cross-sections of appropriate scale;
- describe and map landforms associated with important wildlife habitat features including elevated land forms, eskers, ridges, cliffs, rock outcrops and exposed bedrock where applicable;
- provide a description and location of any erosion-sensitive soils and areas of ground instability;
- as required, provide information on soil depth by horizon and soil order within the project area to support soil salvage and reclamation efforts, and to outline potential for soil erosion;
- describe the suitability of topsoil and overburden for use in the reclamation of disturbed areas including an assessment of the acid generating potential and metal(loid) leaching potential of overburden to be used;
- describe the historical land use and the potential for contamination of soils and sediments;
- describe any known or suspected soil or sediment contamination with the study area taking into account historical land use; and
- identify areas or ecosystems that are sensitive or vulnerable to acidification resulting from the deposition of atmospheric contaminants.

8.3.2. Effects to topography, soil and sediment

The Impact Statement must describe all effects of the Project on topography, soil and sediment including:

- potential for changes to soil quality, loss, fertility, compaction, and erosion due to vegetation clearing;
- potential and likelihood of re-suspended, releasing or otherwise disturbing known or suspected soil or sediment contamination; and
- potential for changes to soil from the deposition of dust produced from project activities.

8.3.3 Mitigation and enhancement measures

The Impact Statement must describe the mitigation measures for the possible effects to topography, soil and sediment, and provide a rationale with quantitative and qualitative evidence that explains the effectiveness of the proposed measures:

- including the consideration of the use of phytostabilization and native plants as mitigation measures to reduce the mobility of contaminants in soil.

8.4. Atmospheric, acoustic, and visual environment

8.4.1. Baseline conditions

The Impact Statement must:

- characterize the ambient air quality in the project, local and regional study areas and identify existing emissions and contaminant sources;
- provide baseline ambient air concentrations for contaminants, in particular near key receptors (e.g. communities, traditional land users, wildlife) and quantify emission sources for the following:
 - total particulate matter;
 - particulate matter less than 2.5 microns (PM_{2.5});
 - particulate matter less than 10 microns (PM₁₀);
 - carbon monoxide (CO);
 - sulphur dioxide (SO₂);
 - nitrogen dioxide (NO₂) and nitrogen oxides (NO_x);
 - ozone (O₃);
 - volatile organic compounds (VOCs)⁶, individual or an appropriate subset;
 - polycyclic aromatic compounds, including polycyclic aromatic hydrocarbons (PAHs), alkylated PAHs, PAH transformation products, including nitro and oxy-PAHs, and dibenzothiophenes (DBTs);
 - metals;
 - Diesel Particulate Matter (DPM);
 - any other relevant air pollutants from mobile, stationary or fugitive sources;
- compare ambient air quality results with applicable regional, provincial and federal standards. For air pollutants with standards, the comparison must use the same averaging period and the statistical format associated with each numerical value;
 - standards include: Canadian Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Objectives (NAAQO), or relevant provincial standards. The proponent must refer to the new CAAQS established by the Canadian Council of Ministers of the Environment (CCME) for PM_{2.5}, O₃, SO₂ and NO₂ for 2020 and 2025;
- describe deposition through either existing long term, or new monitoring data for a duration of a minimum of one year;

⁶ It is recommended to assess specific aldehydes that are associated with diesel exhaust (DE), such as acetaldehyde, formaldehyde, 1,3-butadiene, and acrolein, as well as benzene, for the evaluation of VOCs.

- describe the data source(s), including monitoring location(s) and duration, and data validation and quality control methods;
- identify and address issues related to the quality of the monitoring data and seasonal variability in the baseline survey and determine ambient contaminant concentrations using representative monitoring data, collected over an appropriate duration and geographic scope;
- if modelling is undertaken to understand baseline ambient air quality, then describe direct and indirect sources of baseline air emissions, including mobile, stationary and fugitive, and provide an inventory of all equipment sources of baseline air emissions;
- provide current ambient noise levels at key receptor points (e.g. communities, traditional land users, sensitive human receptors, and wildlife), including the results of a baseline ambient noise survey and permissible noise levels for each receptor. The information on usual noise sources (natural or anthropogenic), their geographic extent and temporal variations must be included. At the time of collecting baseline data for the study on ambient noise where there are human receptors, it is recommended that the following aspects be considered:
 - natural sounds;
 - soundscapes (see [*ISO 12913-1:2014. Acoustics — Soundscape — Part 1: Definition and conceptual framework*](#));
 - expectations regarding quiet conditions in specific places or at specific times;
 - usual sleeping hours (the default assumption is 10 p.m. to 7 a.m.); and
 - degree of baseline annoyance attributable to existing noise sources (e.g. vehicle traffic, aircraft, other industrial noise);
- justify the selection of and provide information on all noise sensitive receptors in the study area, including any foreseeable potential receptor and the distance between the receptors and the Project;
- 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;
- describe night-time illumination levels during different weather conditions and seasons; and
- describe landscapes of interest, visual screens and other components of the visual environment, and locate them on maps.

The proponent should consult the additional guidance for atmospheric environment provided in [*Appendix 1 - Guidance for Biophysical Components*](#).

8.4.2. Effects to the atmospheric, acoustic, and visual environment

The Impact Statement must describe the effects of the Project on the atmospheric, acoustic and visual environment, including:

- provide a detailed description of emission sources of air pollutants that will be generated from each project phase listed under [8.4.1. Baseline conditions](#)
- provide detailed methodology and assumptions used to estimate emissions of air pollutants released.
 - all relevant emission factors should be provided and referenced;
 - for all applicable emission sources, include the assumed tier of emission standard for each emission factor applied;
 - provide details of the achievement of emission standards for all mobile and stationary engines used in the Project;
- use atmospheric dispersion modelling to predict the fate of air pollutants resulting from project-related sources and provide appropriately scaled contour map(s) plotting the predicted pollutant levels for all phases of the Project (see [Appendix 1 - Guidance for Biophysical Components](#) for guidance on dispersion modelling);
 - determine whether the formation of secondary pollutants (pollutants which are not directly emitted but form when other primary pollutants react in the atmosphere) resulting from the Project under assessment has the potential to raise concentrations above baseline levels – if so, identify and characterize these pollutants;
- provide the rationale for the choice of air quality model, including the type and magnitude of emissions, the complexity of sources, terrain and meteorology, or for why modelling is not being used to predict fate of air emissions;
- 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;
- assess the uncertainty in the modeled air pollutant concentrations using relevant range of model inputs. All sources of uncertainty should be taken into account, including:
 - model uncertainty, including a consideration for how uncertainty in modelled predictions may vary spatially and temporally;
 - uncertainty in baseline concentration estimates, in the estimates of meteorological inputs, and in estimates of source emissions (from sources attributable to the Project, and externally);
- conduct a source contribution analysis to assess the relative contributions of project and non-project emission sources on pollutant concentrations at key receptors. The source contribution analysis should be conducted for all pollutants that exceed 10% of the relevant guidance or standard value. Emission sources should be grouped into appropriate categories;
- assess effects to receiving environment through:
 - comparison of predicted air pollutant levels to the most stringent federal or provincial air quality standards, including the Canadian Ambient Air Quality Standards (CAAQS). 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;
- comparison with critical thresholds (consider current, historical loadings, buffering capacity, including Acid Deposition Critical Loads);
 - comparison with sensitive ecological receptors (consider effects thresholds of species in question);
 - comparison to other appropriate existing guidelines, objectives or standards, where relevant. This includes regional and community-based air quality guidelines;
 - describe changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, including changes to the perception of non-anthropogenic sounds and the anticipated zone of influence from acoustic impacts from the Project;
 - where there is public and/or Indigenous community(ies) concern associated with an increase in sound levels during construction, provide a vibration and sound impact assessment, including an overview of the concerns;
 - consider the expectations of peace and quiet at receptors (e.g., for incorporating appropriate adjustments in the quantitative noise assessment) and the applicable community-based policies concerning noise (e.g., complaints resolution processes as a mitigation measures/follow-up monitoring mechanism);
 - for projects that result or may result in an increase in sound emissions during any phase of the Project:
 - quantify sound levels at appropriate distances from any project facility and/or activities and describe, for each contributing source, the timing (e.g., hours of night-time activities), the number, and duration of noise events, and their sound characteristics, including frequency spectrum;
 - provide the hourly distribution of baseline noise events at night in comparison to predicted individual noise events at night at each receptor location;
 - describe the locations and characteristics of sensitive receptors, including species at risk;
 - describe engagement with regulators, stakeholders, community groups, landowners and Indigenous communities about potential effects to the acoustic environment, including opportunities for their involvement in the assessment of these potential acoustic effects;
 - identify and justify the approach to determine the extent to which sound effects resulting from the Project are adverse;
 - provide a description of any changes in nighttime light levels resulting from the Project;
 - quantify light levels at appropriate distances from any project facilities, including the timing (e.g. night hours), frequency, duration, distribution and character of light emissions;
 - describe the locations and characteristics of the most sensitive receptors, including species at risk and areas favoured by Indigenous peoples for the practice of traditional activities;

- describe engagement activities and, where appropriate, provide a record of engagement with regulators, stakeholders, community groups, landowners and Indigenous peoples regarding potential effects on the visual environment; and
- describe any positive changes.

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

8.4.3 Mitigation and enhancement measures

The Impact Statement must identify mitigation measures for adverse changes to the atmospheric, acoustic and visual environment or any enhancements for positive effects.

In particular, the Impact Statement must:

- describe all methods and practices to be deployed to reduce and control emissions, including details on actions, triggers, and frequency of mitigation measures. If the best available technologies are not included in the project design, the proponent should provide a rationale for the technologies selected;
- document and justify how the contaminant emission reduction efficiencies were applied in the calculation of emission rates, including details of all assumptions associated with these mitigation measures and their feasibility;
- provide a description of existing and planned measures to reduce odours and dust, including a description of improvements to existing infrastructure, as applicable;
- provide a description of any ambient air quality monitoring to be implemented to verify the predictions from modelling results and to confirm the effectiveness of mitigation measures;
- provide a description of participation in national or regional air emission tracking and reporting programs (e.g. National Pollutant Release Inventory) or provide rationale why participation is not required;
- develop and implement strategies compliant with regional and national commitments, such as the CCME's commitment regarding pollution prevention;

- consider the inclusion of Indigenous peoples to participate in the development of a dust suppressant plan;
- provide a noise management plan, including identification of the noise sources, consideration of any applicable noise adjustment (e.g. community type, time-of-day, tonal and/or impulsive noise), common noise mitigation measures (including a detailed complaint resolution process), the performance efficiency of the noise control devices, the best practices programs and the continuous improvement programs, establish the need for follow-up monitoring for the purposes of validation of the model or due to any concern raised by participants, and describe opportunities for Indigenous Knowledge holders to participate in the development of the noise management plan; and
- provide a lighting management plan, including the planning and management of lighting and of the ambient light for every activity site and the consideration of measures for the reduction of excessive light during construction and operation. Consider the following options of measures for lighting management:
 - avoid or minimize the use of artificial light;
 - select low-intensity lighting;
 - use lighting fixtures that limit or concentrate the lighting to targeted areas and avoid light spilling out of the spaces to be illuminated;
 - limit the projection of light toward the sky by using fixtures that produce dark, uniform lighting that meets actual lighting needs;
 - avoid the emission of light at more than 90 degrees; and
 - avoid lights that emit blue/green/white/UV wavelengths.

8.5. Groundwater and surface water

8.5.1. Baseline conditions

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 hydrometeorological (temperature, precipitation, evapotranspiration) and hydrological information (regional flows, site specific flows, water levels) and discuss how the chosen data sets are applicable to the Project in terms of:
 - geographic proximity;

- similarity of sites (e.g., watershed sizes, elevation, wetland areas, etc.);
- length of record (e.g., more than 30 years, if possible);
- applicability to the project period (e.g., currency of data, presence of trends or cyclicity); and
- any compromises between the above;
- describe and illustrate on one or more topographic maps, at appropriate scales, the drainage basins in relation to key project components. On the map(s), identify all waterbodies and watercourses, including intermittent streams, flood risk areas, wetlands, watershed and sub-watershed boundaries, and direction of flow;
 - if applicable, indicate the intended locations of water crossing and watercourse diversions;
- provide a list of all waterbodies and watercourses (permanent, intermittent and ephemeral) that may be directly or indirectly affected by the Project. Provide a table that groups waterbodies and watercourses by sub-watershed and provides the following information about each:
 - type of watercourse impacted (e.g. lotic or lentic system, lake, river, pond, temporary or permanent stream);
 - size of the waterbodies and watercourses, as applicable (e.g. width at the ordinary high water mark, length or area);
- provide flow hydrographs and corresponding water levels for nearby streams and rivers, including any site-specific rating curves showing the full range of seasonal and inter-annual variations; as well as seasonal baseflow;
 - hydrographs may be based on data from nearby gauging stations or from gauging stations on site;
 - approach used should take into account the need to provide information for use in fish habitat characterization and effects assessment as guided by the Canadian Science Advisory Secretariat's science advisory report entitled "*Framework for assessing the ecological flow requirements to support fisheries in Canada*";
- provide stage hydrographs for lakes expected to be affected by the Project showing the full range of seasonal and inter-annual water level variations;
- for each waterbody and watercourse potentially affected by the Project, provide a description of ice cover, thickness and conditions and the timing of freeze-thaw cycles;
- provide for each waterbody potentially affected by the Project, bathymetry, maximum and mean depths, vertical profile information, information on stratification and turnover, and sediment composition (e.g. particle size analysis and sediment quality);
- using traditional field and mapping techniques, provide a delineation and characterization of groundwater–surface water interactions, including an identification of groundwater-dependent ecosystems, wetlands, discharge and recharge areas that are potentially affected by the Project;

- use this information to calibrate and verify numerical flow modelling;
 - the chosen approach should take into account the potential effect that changes to groundwater-surface water interactions have on fish and fish habitat;
- develop a quantitative surface water balance for watersheds potentially affected by the Project, detailing water intake and outflow to the environment;
- describe the surface water, ground water and sediment quality baseline characterization program, including sampling site selection and locations, monitoring duration and frequency, sampling methodology, and analytical protocol, including quality assurance and quality control measures;
 - describe the incorporation of any applicable historical data or existing information;
 - characterization program should include sampling locations within the project area, the local and regional study areas, and should include reference locations that are unlikely to be impacted by the Project;
- provide baseline data for relevant physicochemical parameters and chemical constituents for surface water, groundwater and sediment quality;
 - physicochemical parameters may include temperature, pH, electrical conductivity, dissolved oxygen, turbidity, total suspended solids, total hardness, total, particulate, and dissolved organic and inorganic carbon, total dissolved solids;
 - relevant chemical constituents may include major and minor ions, total and dissolved trace metals, radionuclides, total mercury, methylmercury, polycyclic aromatic compounds, nutrients, organic and inorganic compounds, or other compounds of potential concern;
 - water sample collection and analysis should use appropriately sensitive detection limits and the data should illustrate the seasonal and inter-annual variability in baseline surface water quality with sufficient years of baseline data to fully characterize, including possible variabilities due to groundwater–surface water interactions.
- describe baseline concentrations for relevant physicochemical parameters and chemical constituents in relation to applicable water quality and sediment guidelines;
- identify springs and any other potable surface water resources within the local study areas, and regional study areas as required, and describe their current use, potential for future use, and whether their consumption has Indigenous cultural importance;
- identify domestic, communal, or municipal water wells within the local study areas, and provide information on their depth, distance from the Project, stratigraphy, screened hydrostratigraphic unit and piezometric level and capacity, and describe their current use, potential for future use, and whether their consumption has any Indigenous cultural importance. Where available within the regional study area, domestic, communal, or municipal water wells should be identified, and details provided for the wells within the local study area;

- identify groundwater-producing strata (coarse-grained sediments and permeable bedrock) that may be affected by the Project. Where current domestic, communal, or municipal water wells access these strata, their distance from the Project must also be marked and added to the map;
- provide a summary of key groundwater monitoring wells within the local study areas, and regional study areas (if available) used to inform the conceptual model, and identify their location, groundwater quality information and monitoring frequency. Provide representative hydrographs showing the range of seasonal and inter-annual water level variations and any spatial variation in the local study areas to support the assessment of groundwater effects as they relate to fish and fish habitat. Information within the regional study area should be provided as required, to support the development of the conceptual model of groundwater flow;
- describe the hydrostratigraphic units (aquifers, aquitards, aquicludes) of the hydrogeological environment in both bedrock and overburden and provide a piezometric map showing heads and the direction of groundwater flow;
- 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, including groundwater divides and boundaries with surface water;
- 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 (including historical information related to previous mining periods; and dewatering information related to the advanced exploration program) on groundwater flow
- present a 3-dimensional numerical groundwater flow model developed for the project area based on the conceptual model of the hydrogeological environment;
 - state the purpose, limitations and assumptions in the modelling approach, including calibration methods, model validation and accuracy;
 - calibrate the numerical model to baseline hydrogeological conditions and historical hydrogeological conditions (as applicable) using groundwater level and stream flow monitoring data and provide metrics and graphs describing the quality of the calibration that was achieved and discuss how spatial variability is considered in model calibration;
 - analyse the sensitivity of key model outputs to hydraulic properties and climatic parameters such as recharge, and describe uncertainty within the model as it relates to model assumptions;

- 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;
- present a conceptual model for the hydrological environment, as appropriate to describe baseline conditions for surface waters. The model should be developed to support the assessment of potential changes to water and sediment quantity and quality, including a consideration of the surface water quality mixing zone modelling, in rivers, streams, lakes, springs and wetlands, with input from regulators and Indigenous communities; and
- explain how baseline data was gathered, and modelling developed, at a scale and resolution that allows for the application of results about groundwater and surface water to the assessment of interrelated VCs, notably for fish, birds and other wildlife, their habitat and their health, as well as human health.

8.5.2. Effects to groundwater, surface water and aquatic sediment

The Impact Statement must:

- describe the effects of the Project on surface and ground water (quality and quantity), including effects related to:
 - project use of surface water or groundwater resources;
 - changes to water flow and water levels in Ava Lake and other waterbodies or watercourse diversions, including the use of channels and dykes to divert the Misema River around York Lake;
 - discharge of water, effluent, wastewaters or other substances to the environment;
- describe how the effects of climate change are taken into account in the evaluation of the project effects;
- discuss changes to watersheds, including alignment and condition of waterbodies and watercourses (permanent, intermittent and ephemeral), including those created, removed or altered by the Project;
- discuss the effect to the watershed of overprinting of surface water features by project infrastructure (i.e., percent change in instantaneous flows);
- quantify the extent of hydrological changes that will result from disturbances to aquifers and surface water features, taking into account climate change (see also section [14 Effects of the environment on the Project](#)). This includes changes to the quantity or timing of surface flow, water levels, ice thickness or extent, sediment input, and channel regime in watercourses, and water levels in affected waterbodies;
- present an integrated site water balance model incorporating surface and groundwater fluxes to or from all major project components, for all project phases. Include estimates of surface water runoff rates for major project components;

- indicate the groundwater and surface water withdrawal requirements during all phases and specify:
 - the timing, quantity and quality of water withdrawn from the environment (flow rates and annual volumes);
 - any treatment carried out on these waters; and
 - the conditions under which this water is released into the receiving environment;
- present key flow rates for all project components and water management structures, including inflow, outflow or surface run off from storage piles, contaminated material storage, and tailings management facilities;
- present water levels and flows in waterbodies impacted by the Project, including, but not limited to, those on the Misema River system;
- present a comprehensive site water management plan for the Project's life cycle including for:
 - water inflows and outflows from project site;
 - water diversion, including the proposed design flows of the diversion channel;
 - process water management;
 - stormwater management;
 - water management within the project site;
 - water management in the open pit;
 - mine flooding strategies, including the potential for reconnection of the pit lake to the Misema River;
- 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;
 - the use of telescopically refined groundwater flow models is recommended in the vicinity of open pits and tailings management facilities;
- using the 3- dimensional 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 operations and the post-closure period;
 - estimate seasonal changes to surface water and groundwater regimes during operations and the post-closure period, including effects of depressurization of the basal aquifer and dewatering of surficial deposits, effects on baseflow in rivers and streams, effects on wetlands, effects on groundwater-surface water interactions as they relate to fish habitat, effects on potable supplies, and effects on natural flow divides;
 - describe the contaminants associated with the Project, their spatial and temporal locations and their potential flow paths (e.g. groundwater seepage pathways and how

- they relate to potential receptors). Characterize how they could affect surface and groundwater quality, including information on the source(s) of any contaminants, and their transport and fate in the hydraulic environment;
- describe the downgradient flow of groundwater affected by the Project, with the use of figures showing groundwater piezometric contours and particle tracking results;
 - describe potential effects to surface water flows or water levels due to groundwater drawdown, and
 - describe the contaminant attenuation capacity within the hydrogeological units in the project area. With this input, assess the potential for off-site groundwater and surface water contamination. Alternatively, the proponent may conservatively assume no attenuation capacity, but must still describe, in detail, potential degradation products (i.e. daughter materials) that may result from attenuation and other processes during groundwater flow;
 - describe the potential changes to surface water, groundwater and sediment quality related to the Project including;
 - potential changes to surface water quality due to surface erosion and sedimentation, from the removal of vegetation and changes to riparian, wetland, and terrestrial environments;
 - potential changes to surface water quality due to the generation and deposition of dust and particulate matter and any contaminants they contain (such as heavy metals, metal(loid)s, mercury, methylmercury);
 - potential changes to sediment quality and composition due to discharge of sewage works effluent and other Project-related discharges to surface waters.
 - potential changes to surface water as a result of acidifying emissions from the Project and acid deposition, using the information provided to meet the requirements under section [8.4.2 *Effects to Atmospheric, Acoustic and Visual environment*](#)
 - present an integrated chemical mass balance model incorporating surface and groundwater chemical loads to or from all major project components, for all phases including;
 - a clear description and rationale for all input parameters and assumptions;
 - base case (i.e. most likely, mean, median) and worst case (e.g. 75th to 90th percentile) scenarios, plus applicable sensitivity scenarios;
 - using the integrated chemical mass balance model, describe predicted worst, base, and sensitivity case changes caused by project activities to surface water, groundwater and sediment quality in the receiving environment, including but not limited to those associated with watercourse and waterbody crossings, blasting, diversions, dewatering, water withdrawal, wastewater return, seepage from piles of material and tailings, overflows from excavation, and surface runoff. Include a description of changes to physicochemical parameters and chemical constituents;

- 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 tailings management strategies, including:
 - the solid and liquid composition and volume of specific waste streams including results of geochemical testing described in Section 8.2 including cyanide and its degradation products, total organic carbon dissolved inorganic carbon, organic carbon, isotopic composition of water, and potential tracers of groundwater contamination for liquid streams;
 - disposal sites, including their location on the post-closure landscape;
 - feasibility and effectiveness of different reclamation strategies (i.e. various wetland landscapes and dry landscapes);
 - measures and strategies for recycling, preventing pollution and minimizing waste throughout the life-cycle of the Project, including information on the technologies that will be employed; and
 - identify the limits of proposed tailings treatment technologies at closure;
- provide an assessment of potential contamination to surface waters and groundwater as a result of the geochemistry of the pit walls, and the reconnection of the pit lake to the Misema River system during reclamation and decommissioning;
- describe the quantity and quality of all effluent streams released from the site to the receiving environment, including effluent from treatment facilities, dewatering activities, seepage and surface run off from the project components and site;
 - compare the quality of all effluent streams to federal and provincial release limits to determine if worst, base, and sensitivity site predictions require mitigation measures (i.e. BATEA);
- describe the worst, base, and sensitivity case changes to surface water, groundwater and sediment quality in the receiving environment resulting from acid rock drainage, neutral mine drainage, and/or metal(loid) leaching:
 - provide potentially acid-generating rock volumes and tonnage for the life cycle of the Project, and disposal methods;
 - consider the results of the geochemical characterization study that evaluated the potential for acid rock drainage, neutral mine drainage, and/or metal(loid) leaching for mined materials, tailings, and construction materials (Section 8.2);
 - provide estimates of the potential for mined materials, tailings and construction material to be sources of acid drainage, neutral mine drainage, and/or metal(loid) leaching, timing to its onset, and short- and long-term loading rates calculated from kinetic testing for both neutral and acidic conditions, with consideration for the use of a proxy (i.e. historical mine waste, analytical tests replicating acidic conditions) if kinetic tests have not produced acidic leachate, if applicable;

- predicted (worst, base, and sensitivity case scenarios) changes to surface water, groundwater and sediment quality due to all discharges and effluents from the Project entire life-cycle, including changes to physicochemical parameters (temperature, pH, salinity, dissolved oxygen), and relevant chemical constituents (major and minor ions, inorganic and organic carbon, heavy metals, metal(loid)s, radionuclides, nutrients, organic compounds); and
- compare the predicted worst, base, and sensitivity case scenario changes to groundwater, surface and sediment quality to baseline and applicable guidelines, objectives or standards.
- describe locations at which potential changes to water or sediment quality will be assessed, including:
 - all point and diffuse sources of discharges;
 - immediate receiving environment for any point of diffuse sources of discharges from the Project;
 - at outer boundary of mixing zone;
 - where the water quality from the immediate receiving environment begins to meet Water Quality Guidelines, or background levels for that contaminant
 - at project boundary;
 - at Local Study Area boundary,
 - at Regional Study Area boundary; and
- analyze and describe changes to surface and groundwater at a scale and resolution that allows for the application of results to the assessment of interrelated VCs, notably for fish and fish habitat and human health. Carry forward the assessment of potential changes in water quality, as required in the following sections of the Guidelines.

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

8.5.3. Mitigation and enhancement measures

The Impact Statement must

- describe the mitigation measures for the possible effects on the quantity and quality of surface water, groundwater and sediment, including water supply wells and provide a rationale with quantitative and qualitative evidence that explains the effectiveness of proposed measures;
- describe any applicable water quality treatment measures and provide evidence supporting the effectiveness of these measures (refer to MEND report 3.50.1), including predicted inflow and outflow concentrations for relevant water quality parameters;
- provide the details of mitigation measures comprised in water management plans proposed for waterbodies and watercourses likely to be affected during all phases of the Project, including measures applicable to water use minimization;
 - the proponent may also indicate other water sources (e.g. recycled water) for the Project and consider the possibility of reusing the water;
- describe and justify water use for the Project and the measures that will be taken to eliminate or reduce the adverse effects, including the supply and discharge of water, and potential exchanges between watersheds;
- If the final details of the hydrostatic⁷ tests have not been confirmed yet, the proponent nonetheless must specify the expected requirements, the options available and the criteria it intends to apply to assure protection of water resources:
 - the proponent may also indicate other water sources (e.g. recycled water) for the Project and consider the possibility of reusing the water;
- describe any specific monitoring program planned during construction, including assessment of effects before and after construction activities in order to optimize or adapt mitigation measures at the time of their application;
- describe groundwater and surface water monitoring programs during the operations and post-closure periods including:
 - the proposed monitoring points to assess changes to surface water quality, which should include monitoring at all point and diffuse sources of discharge and in the immediate receiving environment and at the boundaries for the outer mixing zone, the Project, the local and regional study areas;
 - the proposed monitoring points to assess changes to groundwater quality, which should include well locations and depths; and
 - the parameters that will be measured, the duration and frequency of monitoring, the sampling protocol and analysis protocol and the quality assurance and quality control measures. Include the description of the measures that will be implemented if the criteria are exceeded;

⁷ The term 'hydrostatic testing' is being used in this case in a general sense to mean any form of hydraulic testing, and could include on-site pump tests, slug tests, packer tests and others or various laboratory tests of field samples, to assess the bulk permeability of a geologic material.

- describe any specific monitoring program planned during construction, including assessment of effects before and after construction activities in order to optimize or adapt mitigation measures at the time of their application;
- describe methods for managing the seepage and runoff from mine infrastructure, including waste rock, tailings, overburden and ore stockpiles, and haul roads, and indicate how it will be collected, managed and monitored, during all phases;
- describe methods for the prevention, monitoring, management and control of acid rock drainage, neutral mine drainage, and/or and metal(loid) leaching during all project phases;
- describe the conceptual approach to the identification and management of potentially acid generating and/or metal(loid) leaching mine rock during mine construction and operations. Describe methods for operational testing to support segregation, if applicable.

8.6. Vegetation, riparian and wetland environments

8.6.1. Baseline conditions

The Impact Statement must:

- provide a description of the biodiversity, relative abundance and distribution of vegetation species and communities of ecological, economic or human importance with the local and regional study areas of the Project, including:
 - rare plant communities and communities of limited distribution;
 - species at risk, including those listed in Schedule 1 of the SARA, provincially listed or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to be 'at risk', including species of concern;
 - critical habitat as described in final or draft recovery strategies or action plans for species at risk; and
 - species or communities of importance to Indigenous peoples, including for traditional, medicinal and cultural purposes;
- describe the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline vegetation biodiversity and discuss the rationale for their selection;
- provide maps, at an appropriate scale, of the vegetation species and communities of importance within the local study area, and where available, the regional study area;
- describe the current level of both anthropogenic and natural (fire, flood, drought, etc.) disturbance associated with vegetation and forest land, including a description of level of habitat fragmentation and loss, historical and current disturbance, any proximate activities that have resulted in changes to fire regimes (e.g., fire suppression, flooding, insect infestations, etc.);
- describe any weed species, other invasive species, and introduced species of concern; and

- describe the use of local vegetation for medicinal purposes, or as a source of country foods (traditional foods) and whether its consumption has any Indigenous cultural importance
- describe the shoreline, banks, current and future flood risk areas, and wetland catchment boundaries;
- quantify, describe and map riparian areas within the local and regional study area potentially affected by the Project;
- use the [Ontario Land Cover Compilation v.2.0](#) to quantify, describe and map wetlands (shallow waters, marshes, swamps, fens, and bogs) within the local and regional study area potentially affected by the Project, in the context of:
 - wetland class, ecological community type and conservation status;
 - biodiversity;
 - wetland habitat that provides important functions for species at risk;
 - abundance at local, regional and provincial scales;
 - distribution; and
 - current level of disturbance;
- 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 map wetlands on federal lands potentially affected by the Project and within the scope of federal permits, authorizations, or other approvals. Provide information adequate to determine if the Federal Policy on Wetland Conservation applies;
- identify and describe wetland capacities to provide for wildlife and wildlife habitat, and fish and fish habitat;
- 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 - Guidance for Biophysical Components](#) for more guidance on conducting a wetland function assessment);
 - provide a rationale for the wetland functions assessment method chosen and submit complete data sets from any survey sites, including geospatial data files;
- contact the relevant provincial and local government authorities to determine if other wetland conservation policies, regulations or wetland compensation guidelines apply;
- identify a local study area that takes into account watershed area and hydrological connectivity of wetlands within, or bisected by, the project area;
- 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; and
- provide rationale for how the selected local and regional study areas meet the above criteria.

8.6.2. Effects to vegetation, riparian and wetland environments

The Impact Statement must describe the effects of the Project on vegetation and the riparian and wetland environments, including:

- describe all potential effects due to the Project, for all phases, to vegetation and to the riparian and wetland environments;
- describe the key indicators used to assess project effects and the sensitivity of vegetation communities, wetlands, and riparian and terrestrial environments to disturbance, including rationale for their selection, and their connection to the indicators used to characterize baseline conditions;
- describe changes related to landscape disturbance, including loss and fragmentation of habitats, alteration of riparian areas, including buffers or setbacks and project effects on areas of soil or ground instability;
- quantify the area of vegetation communities, riparian, wetland, and terrestrial environments, that may be cleared or otherwise disturbed within the study area during all phases of the Project, including a description of the disturbance, and take into consideration:
 - changes to interior to edge habitat ratios;
 - changes to the availability of rare habitat; and
 - changes to functions within the remaining vegetation or wetland complex;
- describe the amount, merchantability and location of any merchantable timber to be removed during project construction;
- describe effects onto the biodiversity of riparian, wetland and terrestrial environments, including effects from fragmentation, and changes to regional biodiversity;
- describe effects related to potential introduction of weed species or invasive species or due to the increase in the spread and prevalence of diseases or pests;
- describe any hydrological or water flow changes, either permanent or temporary, that could alter moisture regimes or drainage conditions, and describe the effects on vegetation and wetlands including impacts on fish and fish habitat, where applicable;
- describe any changes to or loss of wetland function, including consideration of ecological (e.g. hydrological, biogeochemical cycling, habitat and climate functions) and socio-economic functions of wetlands. Describe and justify the methodology used to assess the effects;
- describe potential effects from project emissions that may result in contamination and acidification of nearby land and waterbodies, including consideration of the sensitivity of vegetation communities, wetlands, and riparian and terrestrial environments to disturbance;
- describe potential changes to riparian, wetland and terrestrial environments due to activities that may affect topography, soil erosion, compaction, and productivity, contamination, bank

slopes and suspension of sediment or due to any contaminants of concern potentially associated with the Project that may affect vegetation, soil, sediment or water;

- 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; and
- describe any positive changes.

8.6.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation measures for the potential effects on vegetation and on riparian and wetland environments.

In particular, the Impact Statement must:

- describe and justify the construction methods used to cross wetlands and other sensitive habitats, and the criteria for determination of techniques proposed for each crossing, including the locations where trenchless crossing methods will be employed;
- describe and justify the ways of avoiding or reducing the temporary or permanent adverse effects on wetlands and riparian habitats;
- describe and justify the width of the construction right-of-way and the permanent right-of-way, including the locations where the right-of-way will be narrowed to eliminate or reduce the adverse effects of any linear components, including the 115 kV transmission line, site access road, and cottage access road;
- describe and justify the necessity of temporary construction sites, and the considerations taken for minimizing the adverse effects, namely the location choice and management measures;
- describe and justify the proposed measures to mitigate bank erosion, including measures to eliminate the potential for erosion, such as bank stabilization using vegetation;
- describe the vegetation standards and controls that will be deployed during construction and operation of the Project;
 - describe and justify the measures allowing identification of invasive species or other undesirable introduced species, avoid their propagation and control them during all phases of the Project, including the necessity of preconstruction surveys to identify any high density areas;
 - identify the criteria and circumstances of application of chemical, biological or mechanical control methods as well as the relevant regulations and determine the adverse effects associated with control methods; and
 - describe the selection of plant species to be conserved and planted in order to promote vegetation communities with low natural growth;
- concerning wetlands:

- explain how avoidance of wetlands was considered, namely by considering other locations for project components and activities;
- explain how mitigation measures consider the natural succession and the variability of the environment over time; and
- describe proposed compensation measures (see [Appendix 1 - Compensation and Offset Plans](#) for relevant guidance);
- describe any reclamation and revegetation procedures proposed as mitigation measures, including:
 - revegetation techniques, timing, and the locations where they would be implemented;
 - selection of plant species to be maintained and planted to promote return to a natural ecosystem, including consideration for Indigenous use, during operation and upon reclamation, and integration of the reclaimed landscape with the regional landscape;
 - Native and indigenous species adapted to the local conditions should be used when the purpose of revegetation is to naturalize or regenerate the area;
 - the expected timelines, from an ecological perspective, for establishment and recovery of vegetation communities and the expected differences in community composition and structure. Identify the information sources on which the predictions rely, such as evidence from peer-reviewed scientific literature;
 - any sources of uncertainty with respect to the anticipated effectiveness of reclamation. Explain how uncertainty was taken into account in the predictions; and
 - reclamation standards to be used to evaluate ecological equivalency of post-operation reclaimed landscapes, in consultation with Indigenous communities;
- describe and justify the soil treatment methods to eliminate or reduce the adverse effects on the soils and materials in the root area, including recovery techniques (e.g. soil stripping including the proposed width, stump removal and other soil treatment techniques), soil separation maintenance measures, control measures for wind and water erosion, work shutdown procedures in case of wet conditions, and soil settlement prevention measures; and
- describe and justify how to locate pre-existing soil or sediment contamination, the mitigation and monitoring measures that will be undertaken in this regard, and the applicable regulatory restoration measures.

8.7. Fish and fish habitat

The proponent should consult the additional guidance for requirements pertaining to fish and fish habitat provided in [Appendix 1 – Guidance for Biophysical Components](#).

8.7.1. Baseline conditions

The Impact Statement must:

- demonstrate that an appropriate baseline study design was selected to enable the ability to detect change to fish and fish habitat, with a clear description of assumptions and uncertainties, as guided by the Canadian Science Advisory Secretariat's science advice report entitled "A review of functional monitoring methods to assess mitigation, restoration, and offsetting activities in Canada"
- for each waterbody or watercourse (permanent and intermittent) that may be directly or indirectly affected by the Project, ensure the following information is included in addition to the groundwater and surface water requirements described in section [8.5.1 Baseline Conditions](#):
 - type of water body or watercourse;
 - size and depths of the waterbody or watercourse
 - streamflow types and characteristics;
 - substrate type, vegetation and anthropogenic barriers to fish;
 - description of any proposed water work; and
 - for crossings, describe the anticipated method of crossing (trenched or trenchless).
- for each potentially affected waterbody or watercourse frequented by fish, provide the location and area of potential and confirmed fish habitat and a detailed assessment of physical and biological habitat characteristics. Present information as maps using satellite imagery overlaid with relevant information and text description, with associated summary tables. Relevant physical and biological habitat characteristics for fish habitat include:
 - surface and ground water characteristics as requested in section 8.5.1 *Baseline Conditions*;
 - baseline extent of habitat disturbance (e.g. fragmentation);
 - habitat use or suitability for fish and aquatic species present, and habitat function (e.g. spawning, nursery, growth, prey, invertebrate population, food availability, foraging, migration, cover habitat, thermal and overwintering habitat, etc.) and sensitive times for these activities;
 - substrate type, aquatic vegetation, riparian vegetation, bank stability, light penetration, presence of woody debris, presence of beaver dams, stream segment type (riffle, run, pool), natural or anthropogenic barriers to fish passage, and geomorphological features and processes;
- for each potentially affected waterbody or watercourse, provide a detailed description of potentially affected fish⁸ species and populations (as defined in subsection 2(1) of the *Fisheries Act*);

⁸ fish includes: parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

- where data is used to generate biodiversity metrics (e.g. abundance, richness, diversity, density), provide rationale on the choice of metrics based on their applicability for use in the effects assessment and associated follow-up, if applicable;
- describe parameters and ecological processes relevant to predicted effects on fish and aquatic species listed above. For example, it may be necessary to establish a broader ecological baseline if the Project affects a spawning area for a migratory species, but does not affect the larger area they depend on for life processes. Relevant parameters and ecological process may include: migratory patterns, food webs and trophic levels, structural and functional linkages (e.g. predator-prey interactions), life history and population dynamics, sensitive habitats and periods, behaviour, benthic invertebrate community structure, or other relevant ecological processes that fish depend on to carry out their life history;
 - use either a qualitative or a quantitative approach to characterize ecological processes, as appropriate to detect anticipated changes and their likelihood, and include a rationale to support the selected approach;
 - provide a list of aquatic species⁹ at risk likely to be present, and provide the location and description of suitable or potential habitat for these species (residence and critical habitat) in or near the project study area; including:
 - provincial species at risk (specify provincial legislation or regulations); and
 - species listed as at risk by COSEWIC;
- identify and describe the data sources used, including information on data collection (e.g. gear and catch methods, location of sampling stations, date of catches, date of surveys, species surveyed, size and life cycle stage, catch per unit effort). It is recommended that the information be presented in the form of tables;
- provide baseline measurements of contaminants in fish tissue and aquatic species;
- describe the use of fish as country foods or for other traditional purposes, including a description of the particular species of importance and whether its consumption has cultural importance for Indigenous peoples, including medicinal use. All sites used in the study area or historically important sites for the collection of country foods must be identified and mapped, such as important fishing sites; and
- identify and describe sensitive habitat areas within the local and regional study areas and include maps that demonstrate proximity of these areas. Considerations include understanding the potential impacts of the Project on any species that have been recommended for listing under the [*Species at Risk Act*](#) by COSEWIC (e.g., Lake Sturgeon).

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.

⁹ aquatic species means a wildlife species that is a fish, as defined in section 2(1) of the [*Fisheries Act*](#), or a marine plant, as defined in section 47 of that Act.

migratory corridor). Similarly, beaver dams and accumulations of woody debris are not considered impassable barriers to fish.

8.7.2. Effects to fish and fish habitat

The Impact Statement must describe the potential effects of the Project on fish and fish habitat, as defined in subsection 2(1) of the *Fisheries Act*, as defined in section 47 of the *Fisheries Act*. Consider any effects whether they are adverse or positive, direct or indirect, and temporary or permanent, for all phases of the Project, including from the release of effluent or the deposit of a deleterious substance to water frequented by fish, for all developmental stages of fish, and other aquatic species. Refer to section [8.5 Groundwater and surface water](#) for related water quality and quantity requirements and ensure the assessment is conducted at the appropriate scale and resolution to detect the effects of groundwater and surface water changes on fish and fish habitat. The assessment of effects on fish and fish habitat should be guided by the references listed in [Appendix 2 – Fish and Fish Habitat](#).

The Impact Statement must:

- use a [Pathways of Effects](#) approach to determine potential effects to fish and fish habitat;
- delineate anticipated harmful alteration, disruption, or destruction of fish habitat (temporary or permanent) in terms of area, habitat type, sensitivity of habitat and impact (e.g. magnitude, intensity and persistence). Habitat losses must be clearly located and presented on a map at appropriate scales and in a table.
- delineate anticipated death of fish by means other than fishing.

For each water body and watercourse directly or indirectly affected by the Project, the following must be documented and considered in the determination of effects:

- geomorphological changes and their effects on hydrodynamic conditions and aquatic habitats (e.g. modification of substrates, dynamic imbalance, long term bank instability, silting of spawning grounds), including direct and indirect effects from habitat fragmentation;
- changes in groundwater and surface water conditions and their effects on aquatic habitat and life cycle activities (e.g. reproduction rearing, feeding, movements, migrations, winter refuge) and any changes to aquatic invertebrate communities;
- changes to water quality, including:
 - potential introduction of deleterious substances (e.g. sediment, project-related contaminants in seepage and runoff);
 - effluent at the discharge point and in the receiving environment, and seepage and runoff from the mine not discharged through a discharge point (referencing the assessment of water quality in section 8.5);
- compare predicted water quality for all project phases and at all key locations in the receiving environment to applicable water quality guidelines, site specific objectives or benchmarks,

relevant toxicity test results (either site-specific or published), and/or other applicable methods;

- potential discharges to the aquatic environment of waters used for hydrostatic testing;
- potential effects to fish tissue from contaminants, including bioaccumulation downstream of the Project. Include a comparison of predicted water quality for all project phases at all key locations in the receiving environment to applicable water quality guidelines, site-specific objectives or benchmarks, and relevant toxicity test results (either site-specific or published), or other applicable methods. Describe potential effects from contamination on fish and other aquatic species' behaviour, distribution, abundance, and migration patterns;
 - effects should be predicted or modelled using baseline measurements of contaminants in the complete food web (including water, invertebrates and prey fish), and by carbon and nitrogen stable isotope measurements in fish and the complete fish food web;
- changes to relevant parameters and ecological processes that may affect fish and fish habitat, including: migratory patterns, food webs and trophic levels, structural and functional linkages (e.g. predator-prey interactions), life history and population dynamics, sensitive habitats and periods, behaviour or other relevant ecological processes that fish depend on to carry out their life history;
- potential effects on fish populations, including provincially listed aquatic species at risk, and sources of mortality, including, but not limited to:
 - potential losses of individuals, including changes in abundance, and the relationship to population density and the resilience of populations;
 - any modifications in migration, local movements (e.g. upstream and downstream migration, and lateral movements), accessibility or use of habitat, changes in distribution, or stranding of fish, following the construction, operation or decommissioning of works (e.g. physical, chemical and hydraulic barriers);
 - noise and vibrations caused by project activities in or near the aquatic environment (e.g. blasting). Provide a summary of existing studies and research on potential effects of noise and vibrations on potentially affected aquatic species, including behavioural impacts;
 - entrapment, impingement or entrainment;
 - project-specific components including, but not limited to, the dewatering of York Lake, construction of dams and dykes, and diversion of the Misema River.
 - an examination of the correlation between construction periods and sensitive periods for fish (e.g. reproduction), key fisheries windows for freshwater species, and any potential effects due to overlapping periods;
 - effects on the ability to meet local Fish Management Objectives;
 - effects on fish biodiversity considering identified biodiversity metrics and how the Project's effects on aquatic biodiversity may contribute to changes in regional biodiversity and effects on local and regional ecosystems;

- effects on populations as a result of increased access or traffic to the area (e.g. increased access to fishing) caused by the Project;
- changes to riparian areas ([Section 8.6 Vegetation, Riparian and Wetland Environments](#)) that could affect fish and fish habitat and productivity (see [Appendix 2](#) for reference document);
- changes to relevant parameters and ecological processes that may affect fish and fish habitat, including: migratory patterns, food webs and trophic levels, structural and functional linkages (e.g. predator-prey interactions), life history and population dynamics, sensitive habitats and periods, behaviour, benthic invertebrate community structure, or other relevant ecological processes that fish depend on to carry out their life history;
- provide a summary of existing studies and research on potential effects of noise and vibrations on potentially affected aquatic species, including behavioural impacts,
- potential introduction of aquatic invasive species, including pathogens, through project activities, and discussion of the frequency of those activities;
- potential impacts on Indigenous rights and harvest opportunities for species noted as important to Indigenous communities and local communities such as lake trout, pickerel (i.e. walleye), northern pike and smallmouth bass, including:
 - changes in contaminant levels in harvested species and their prey, with a focus on traditional foods harvested by Indigenous peoples; and
 - tolerance thresholds for potential adverse effects that the Indigenous peoples have identified, and how they were considered in the assessment;
- describe and justify watercourse-crossing techniques to be used and the criteria for determining the techniques proposed for each watercourse-crossing;
- any other changes resulting from the Project, including but not limited to dams and/or dykes, water crossings, including over Victoria Creek, transfer of overburden over Victoria Creek, and blasting, that may affect fish and fish habitat or aquatic species at risk and their habitat.
- describe any need for a *Fisheries Act* authorization and describe any consideration of Fisheries and Oceans Canada guidance documents; and
- describe any positive changes, such as habitat creation and, where applicable, provide information on re-stocking (including the number of fish) or creation of new fish habitat (including the new area created).

Additional guidance that should be referenced to support the effects assessment and associated follow up include:

- [A framework for assessing fisheries productivity for the Fisheries Protection Program.](#)
- [A Science-Based Framework for Assessing the Response of Fisheries Productivity to State of Species or Habitats.](#)

For projects requiring the use of natural water bodies frequented by fish for the disposal of mine waste¹⁰ 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](#).

8.7.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation measures for the potential effects on fish and fish habitat, including:

- all standard measures, codes of practice, policies, and commitments regarding mitigation that constitute technical and economically feasible proven mitigation measures and that will be applied in common practice, regardless of the location, as well as any new or innovative mitigation measure proposed;
- measures to prevent or mitigate the risk of harmful alteration, disruption or destruction of fish, fish habitat, or death of fish caused by any project activity, including during the sensitive periods and in the sensitive locations (e.g. spawning and migration) for fish and other aquatic species;
- provide details on the relocation of fish and other aquatic species from York Lake, prior to the draining of York Lake and construction of the diversion channels;
- measures applicable to all water crossings, intakes, and outflows including how they would be maintained following construction of the Project;
- describe the conditions on which crossings of watercourses and riparian areas would be restored and maintained after construction of the Project;
- measures to mitigate sensory disturbance and functional fish habitat loss that it may cause, including in relation to blasting;
- measures recommended to avoid fish mortality, for example, during use of explosives in the aquatic environment or nearby, or by fish impingement and entrainment during pumping and water withdrawal operations (e.g. during the construction of temporary structures and of hydrostatic tests);
- measures to prevent the deposit of substances harmful to fish in the aquatic environment;
- measures for impacted riparian or aquatic environments,

¹⁰ For the purposes of this document, mine waste refers to waste rock and effluent as set out in Section 5(1) of the *Metal and Diamond Mining Effluent Regulations*.

- describe the criteria for assessment of the successful restoration of fish-bearing watercourses, as well as the mode and timing and the conditions of documentation of this assessment;
- mitigation measures to be applied during hydrostatic tests, including for water withdrawal and discharge activities;
- measures to prevent the introduction and intrusion of invasive aquatic species during work in or near the aquatic environment;
- measures and plans to offset or compensate for any loss in productivity of fish populations and fish habitat as a result of the Project (see [Appendix 1 - Compensation and offset plans](#), for relevant guidance);
- describe how environmental protection plans will address any applicable federal and provincial policies with respect to fish habitat; and
- describe how the mitigation measures are consistent with any applicable recovery strategy, action plan or management plan.

The proponent must refer to Fisheries and Oceans Canada guidance and explain how it was applied to the assessment, including the references provided in [Appendix 1 - Additional Guidance](#) under *Compensation and offset plans* and *Fish and fish habitat* and in [Appendix 2 – Resources and Guidance](#) under Fish and Fish Habitat.

8.8. Birds, migratory birds and their habitat

The proponent should consult the additional guidance for requirements pertaining to birds provided in [Appendix 1 – Guidance for Biophysical Components](#).

8.8.1. Baseline conditions

The Impact Statement must:

- provide up to date baseline studies, that are representative of current conditions;
- identify species or groups that may be affected differently by the Project and may require different mitigation measures, and where possible should not collapse data into diversity metrics or narrow focus to an indicator species;
- the following groupings should be considered as unique VCs with rationale provided where groups are not included as unique VCs:
 - Raptors, such as hawks, eagles, falcons;
 - Waterfowl, such as ducks, geese, swans;
 - Waterbirds, such as loons, gulls, and terns;
 - Marshbirds, such as grebes, rails, herons;

- Shorebirds, such as sandpipers, plovers, snipes;
- Forest birds, such as warblers, vireos, thrushes;
- Other landbirds, such as owls, swallows, kingfishers;
- identified avian species at risk under federal or provincial jurisdiction;
- important habitats associated with avian species at risk;
- identify any applicable [*Bird Conservation Regions \(BCRs\) and BCR strategies*](#);
- describe the biodiversity¹¹ of bird species and their habitats that are found or are likely to be found in the local and regional study areas;
- identify the metrics, and biotic and abiotic indicators that are used to characterize the baseline conditions and discuss the rationale for their selection;
- identify bird species, communities or groups, that use the study areas at any time of the year that are likely to be directly or indirectly affected and describe their :
 - abundance (including relative abundance in each habitat type) and population status;
 - distribution;
 - life cycle;
 - seasonal ranges, migration, movements;
 - frequency and timing of occurrence;
 - seasonal and annual variation in abundance, distribution and habitat use;
 - habitat association(s) and requirements for all relevant life cycle stages; and
 - sensitive periods (e.g. seasonal, time of day);
- 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. In each portion of the year, survey effort must account for differences in species movements including winter usage of highly habitat-reliant species and highly mobile species that will accurately characterize the use of a site ;
- identify, and show on maps, areas of concentration of migratory birds, including sites used for, breeding, feeding, wintering, resting, staging and migrating;
- describe the habitat and habitat features found in the study areas 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) (can refer to information provided in previous sections). Provide maps showing the location of identified habitat and habitat features associated with the presence of those bird species that are likely to be affected;

¹¹ A description of biodiversity can include the species or communities found, abundance, density, species richness and evenness, species distribution within the study area; their ecological role or position in food webs, their ecological or population health (e.g. breeding status, population trends, movement, habitat availability or connectivity, reproductive status or health, food availability or limitations)

- should there be anticipated displacement of nesting birds, baseline habitat data should provide evidence that there is enough equivalent habitat for birds to be displaced to and that the habitat being removed is not unique to the project study area or region ;
- describe food webs and trophic linkages to summarize biotic interactions . where applicable, that are relevant to the study areas;
- for avian species at risk, locate on an appropriately scaled map the potential habitats, survey locations, records of the species, residences and critical habitat, except where locations and records are considered sensitive information ;
 - identify any and all federal Species at risk and/or Critical Habitat in the study area;
 - identify any provincial Species at risk;
 - identify any species assessed as at risk by the [Committee on the Status of Endangered Wildlife in Canada](#);
 - identify any 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;
 - illustrate on the map the project’s footprint, identifying temporary and permanent infrastructure;
 - locate the highest concentrations or areas of use by species;
- describe the use of (magnitude, timing) birds as a source of country foods (traditional foods) and whether consumption has Indigenous cultural importance ;
- describe other birds of Indigenous cultural importance, including bald eagle, nighthawks and other osprey, whip-poor-will, Canadian warbler, and turkey vultures;
- describe the source of the data, data collection methods, and provide a rationale for any modelling approaches chosen. The baseline data must be sufficient to account for natural variability in populations (generally at least two years of field data) and have been collected by well designed studies (see [Appendix 1 - Guidance for Biophysical Components](#) for more guidance on collecting baseline data); and
- where predictive modelling is required, provide the explanatory data (e.g. covariates such as associated land cover, etc.) required to predict effects on birds (e.g. changes in abundance, density, distribution or other relevant effects) collected in such as way as to represent the following sources of variation where applicable: spatial variation in land cover composition, soil type, geomorphology, hydrological processes, and inter-annual and intra-annual climate variability.

8.8.2. Effects to birds, migratory birds and their habitat

The Impact Statement must:

- describe the interaction between the Project and birds, migratory birds, and their habitat, for all phases, including from:
 - site preparation, vegetation removal, particularly of habitats important for nesting, foraging, staging, overwintering or that act as movement corridors;
 - deposit of harmful substances in waters that are frequented by birds and changes to water quality;
 - changes to the aquatic flow regime and sediment load;
 - construction and operation of tailings disposal facilities (i.e. tailings ponds), wastewater ponds, or other ponds containing process liquids or substances harmful to birds;
 - construction and operation of structures, including power transmission and distribution lines
 - changes to the atmospheric, acoustic, and visual environment (e.g. noise, vibration, lighting, air emissions and dust);
 - site reclamation; and
 - any project activities that may occur during critical periods and/or restricted activity periods for migratory and non-migratory birds, including species at risk;
- describe the key indicators used to assess project effects and the sensitivity of avian communities to disturbance, including rationale for their selection and their connection to indicators used to characterize baseline conditions;
- describe the potential effects of the Project on migratory and non-migratory birds, their nest and eggs, including, but not limited to, from:
 - short- and long-term changes to habitats important for nesting, foraging, staging, overwintering, rearing and moulting and to movement corridors between habitat, and from habitat loss, fragmentation and structural change. Consider changes in terms of habitat type, quality, availability, distribution, and function. short- and long-term changes in food sources in terms of types, quality, quantity, availability, distribution and function;
 - changes to bird-habitat relationships; the change in biodiversity, abundance, and density of the avian community that utilise the various habitat types or ecosystems;
 - changes to mortality risk, including as a result of collision of birds (migratory and non-migratory) with project infrastructure, buildings, flaring gas, overhead lines, vessels and vehicles, as a result of light attraction and from indirect effects, such as increased movement of predators or access to hunting;
 - increased disturbance (e.g. sound, artificial light, presence of workers) considering the critical periods for the birds, including breeding, migration and overwintering;
 - if a temporary relocation hypothesis is made during the operational phases of the Project, support the hypothesis with scientific evidence or through study and monitoring within the project area as the Project proceeds;

- describe the activities most likely to result in disturbance, injury or take of birds (migratory and non-migratory), their nests and eggs, such as vegetation clearing or increased noise from industrial machinery; indicate the timing windows for those activities, the amount, duration, frequency, and timing of disturbances, and whether or not the activities would be permanent or non-permanent in the environment;
- contaminants and bioaccumulation of contaminants, including those that may be consumed by Indigenous peoples;
- analyze the predicted effects for (1) migratory birds, (2) non-migratory birds, (3) each VC, including each species at risk and (4) priority BCR species. Include separate analyses for each activity, component and project phase;
- in the event of bird displacement, any assumptions regarding temporary or permanent relocation should be justified using scientific evidence that there is available habitat within the local or regional study area to allow relocation under a variety of population scenarios, supported by monitoring within the applicable study areas as the Project proceeds. For example, it should be clear that a growing population will not be limited by habitat loss (direct or indirect due to sensory or other disturbance) in the study area.

The proponent should refer to the Government of Canada's guidance on this topic, including:

- [*Avoiding harm to migratory birds.*](#)
- [*A framework for the scientific assessment of potential project impacts on bird*](#)
- [*Migratory birds environmental assessment guideline*](#)

8.8.3. Mitigations and enhancement measures

The Impact Statement must:

- describe the measures to mitigate adverse effects to migratory and non-migratory birds and their habitat, including their eggs and nests;
- describe the measures to prevent and mitigate the risk of harmful, destructive or disruptive activities during sensitive periods and in sensitive locations (e.g. breeding bird season, migration and nesting) for birds, their nests and their eggs, or areas frequented by birds, such as avoiding lights at night during key migration peaks, avoiding excessive loud noises, vibration or blasting during breeding season.
- demonstrate how the proponent considered the timing of vegetation removal and construction to be outside the main breeding season.
- describe and justify the specific timing windows that are being considered ;
- describe measures to mitigate sensory disturbance and the functional habitat loss it may cause; and
- describe measures for preventing the deposit of substances harmful to migratory birds in areas frequented by migratory birds.

The proponent should refer to the [Guidelines to reduce risk to migratory birds](#) and to the [General nesting periods for migratory birds](#), which covers the main nesting periods of migratory birds and reduces the risk of taking their nests or eggs. This recommendation does not authorize the disruption, destruction or taking of a migratory bird, its nest or its eggs outside these periods.

8.9. Terrestrial wildlife and wildlife habitat

The proponent should consult the additional guidance for requirements pertaining to wildlife provided in [Appendix 1 - Guidance for Biophysical Components](#).

8.9.1. Baseline conditions

The Impact Statement must:

- provide up-to-date baseline studies that are representative of current conditions;
- describe and map the biodiversity¹² of terrestrial wildlife species (amphibians, reptiles, mammals) and wildlife habitats (e.g. calving sites, feeding areas, winter habitat) that are found or are likely to be found in the study area, such as, beaver, bears, otter, or moose;
- 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:
 - distribution and location;
 - abundance and population status;
 - life cycle;
 - known residences;
 - seasonal wildlife concentration areas (e.g. amphibian woodland breeding ponds, mature forest stands, mineral licks, seeps and springs, animal movement corridors etc);
 - seasonal ranges, migration and movements;
 - habitat requirements;
 - sensitive periods (e.g. seasonal, diurnal and nocturnal); and
 - provide a map showing the highest concentrations or areas of use by species or relative abundance where available, and differentiating between federal and non-federal lands;

¹² A description of biodiversity can include the species or communities found, abundance, density, species richness and evenness, species distribution within the study area; their ecological role or position in food webs, their ecological or population health (e.g. breeding status, population trends, movement, habitat availability or connectivity, reproductive status or health, food availability or limitations)

- identify the metrics and biotic and abiotic indicators that are used to characterize the baseline conditions (e.g. population size, recruitment rates, etc.) and discuss the rationale for their selection;
- describe the use of wildlife as a source of country foods (traditional foods e.g. moose) and whether its consumption has Indigenous cultural use and value, including for medicinal purposes;
- describe the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural use and value;
- describe, quantify and show on maps the habitat type for animal species, including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and; abundance as it existed before project construction;
- describe any locations within the study area that might constitute sensitive areas for terrestrial wildlife, and show on maps, such as:
 - species at risk critical habitat that has been designated or is under consideration,
 - ecological reserves; wildlife management areas, established or proposed sanctuaries and protected areas, in proximity to the project location or that could be affected by routine project operations;
 - nearby environmentally significant areas such as; National Parks, areas of natural or scientific interest, National Wildlife Areas, or World Biosphere Reserves and areas under consideration or study for such designation;
- identify and describe any invasive species, introduced species of concern; and other species that may be considered as “weed species” in the Project’s context;
- describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use;
- describe the natural disturbance regimes and their sources (e.g. fire, floods, droughts, diseases, insects and other pests, etc.); and
- describe the source of the baseline data, data collection methods, and provide a rationale for any modelling approaches chosen, and describe how community and Indigenous knowledge was incorporated (see [Appendix 1 - Guidance for Biophysical Components](#) for more guidance on collecting baseline data).

8.9.2. Effects to terrestrial wildlife and their habitat

The Impact Statement must:

- describe the potential effects from all phases of the Project on wildlife and wildlife habitat, including population level, regional or local sub-population effects, including, but not limited to:
 - site preparation, vegetation removal, particularly of habitats important for breeding, overwintering or that act as movement corridors;

- noise, light and sensory disturbances;
- water and air emissions or dust;
- dry stack tailings;
- bioaccumulation of contaminants in wildlife;
- habitat loss and fragmentation;
- introduction of invasive species;
- altered predator-prey relations, such as increased wildlife predation;
- Increased vehicle traffic, and
- increase in the spread and prevalence of diseases and other health concerns;
- describe the key indicators used to assess project effects and the sensitivity of wildlife to disturbance. Provide a rationale for their selection, including a clear connection to the indicators used to characterize baseline conditions;
- describe the potential effects from the all phases of the Project on Wildlife Management Unit 28;
- provide an evaluation of the effect of the Project, including any new road access, pipeline, transmission line or other rights of way on wildlife mortality risk and movement patterns;
- describe effects to wildlife biodiversity, considering biodiversity metrics and the biotic and abiotic indicators selected, including changes to regional biodiversity and local and regional ecosystems;
- describe and quantify, where possible, the potential effects to wildlife, including acute and chronic effects to wildlife health, of changes to air and water quality (e.g. from contaminants, effluents, atmospheric emissions, dust deposition, and bioaccumulation) ;
- describe and assess the resilience and recovery capabilities of wildlife populations and habitats to disturbance, including the anticipated potential for the project area to be returned to its existing state with respect to wildlife populations and their habitat following operations ;
- describe the potential adverse effects of the Project, such as increased hunting pressures from in-migration of workers, changes in behaviour of predator species, etc, on species noted as important to Indigenous communities and local communities, and their habitat;
- describe and take into account the tolerance thresholds for potential adverse effects that Indigenous communities have identified; and
- describe changes to important habitat for species important to current use of lands and resources for traditional purposes (e.g., moose).

The provincial government(s) should be considered a source of information on appropriate methodologies to predict impacts to wildlife.

8.9.3. Mitigation and enhancement measures

The Impact Statement must describe the measures for mitigating potential effects on terrestrial wildlife and wildlife habitat, including:

- describe all feasible measures to avoid or lessen potential adverse effects to wildlife and their habitat, including residences and critical habitat. Include a description of the measures in terms of the effectiveness of each measure in avoiding negative effects;
- provide the best technically and economically feasible approaches for mitigating effects on habitat, aligned with the hierarchy of mitigation measures, and justify moving from one mitigation option to another;
- describe and explain the condition in which the temporary construction areas and right-of-way will be restored or maintained following construction, and explain the mitigation measures considered including possible revegetation, obstruction of the sightline, restoration of wildlife corridors and habitat connectivity, reduction of fragmentation and reduction of long-term cumulative effects;
- describe and explain the measures to control the use of the right-of-way and new access roads to access areas that were previously difficult to reach, including by wildlife predators as well as by hunters, off-roading recreationalists, and other users;
- describe the deterrent systems that will be used to mitigate impacts to wildlife and species at risk due to, for instance, attraction to the project site and/or components and activities associated with the Project;
- describe wildlife friendly road-design principles and features, which may include underpasses and wildlife bridges (as well as monitoring to estimate bat and other wildlife mortality);
- describe measures to prevent the release of harmful substances into waters or areas frequented or occupied by wildlife;
- describe measures to address sensory disturbance and the resulting functional loss of wildlife habitat;
- provide details on the implementation of a log sheet to report accidents and malfunctions, including the reporting of wildlife mortality on site, and how this log will inform monitoring approaches; and provide details on how the information from this log will be shared with partnered Indigenous communities;
- provide details of any compensation or offsetting plans proposed following guidance in [Appendix 1 – Compensation and offset plans](#) and available guidance documents, if effects cannot be otherwise avoided or mitigated; and
- describe mitigation measures applicable to wildlife habitat and other biodiversity metrics that will be implemented through reclamation, including timelines and targets that will be used to assess effectiveness.

8.10. Species at risk and their habitat

The proponent should consult the additional guidance for requirements pertaining to Species at Risk provided in [Appendix 1 - Guidance for Biophysical Components](#).

8.10.1. Baseline conditions

The Impact Statement must:

- provide up-to-date baseline studies that are representative of current conditions;
- consider each species at risk as a valued component;
- provide a list of all species at risk that are likely to be in the project area and the study area, including:
 - species listed in Schedule 1 of the federal [Species at Risk Act](#);
 - species protected under provincial legislation, and
 - species assessed by COSEWIC as extirpated, endangered, threatened or of special concern. It is recommended to refer to the most recent COSEWIC annual report for the list of assessed wildlife species posted on its website;
- for each species at risk identify in the list above:
 - describe abundance (including relative abundance in each habitat type), population status, and distribution;
 - describe seasonal and annual variation in abundance, distribution, and habitat use;
 - provide a map showing survey sites, species sighting records, the areas of highest concentration or areas of use;
 - 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), differentiated by federal and non-federal lands; and
 - describe the general life history (e.g. breeding, foraging) that may occur in the project area, or be affected by the Project;
 - identify critical periods (e.g. denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species;
- provide any published studies that describe the regional importance (including economic), abundance and distribution of species at risk, including recovery strategies or plans;
- describe the source of the Species at Risk data, including survey design, sampling protocols and data handling;
 - when using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications;
 - indicate who was consulted in the development of the baseline surveys (e.g. federal/provincial wildlife experts, specialists and local Indigenous communities); and

- describe how community and Indigenous knowledge was incorporated.

See [Appendix 1 - Guidance for Biophysical Components](#) for more guidance on collecting baseline data. The proponent should contact provincial or local government authorities to determine additional data sources and survey methods. A permit under the [Species at Risk Act](#) must be obtained prior to conducting surveys on federal lands that are likely to harm, harass, capture or kill species at risk other than migratory birds.

8.10.2. Effects to species at risk and their habitat

The Impact Statement must:

- describe the potential effects of the Project on species at risk listed under Schedule 1 of the [Species at Risk Act](#), and its critical habitat (including its extent, availability and presence of biophysical attributes). The analysis of potential effects should be provided separately for each species at risk, including separate analyses for each activity, component and phase of the Project;
- describe the potential effects of the Project on species protected by provincial legislation and on species assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna), as well as on the potential habitat of these species that are not currently listed under the [Species at Risk Act](#). Each of these species should be considered separately as a VC;
- describe the key indicators used to assess project effects and the sensitivity of species at risk to disturbance. Provide a rationale for their selection, including a clear connection to the indicators used to characterize baseline conditions;
- clearly identify the locations of federal and non-federal lands within the study area and differentiate between them in the presentation of information regarding species at risk;
- identify provincial, or federal permits or authorizations that may be required in relation to the species at risk, and describe discussions with the appropriate authority regarding permits or authorizations;
- describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted), including direct and indirect effects due to vibration and artificial light in the project area on usage patterns and migratory behaviour of species at risk; and
- 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:
 - number of individuals killed, harmed, harassed;
 - number of residences damaged or destroyed; and
- describe and take into account the tolerance thresholds for potential adverse effects that Indigenous communities have identified.



The provincial government(s) should be considered a source of information on appropriate methodologies to predict impacts to wildlife species at risk. With respect to effects on bird species at risk, the information required is presented in Section [8.8 Birds, migratory birds and their habitat](#).

8.10.3. Mitigation and enhancements measures

The Impact Statement must describe the measures for mitigating potential effects on species at risk, as well as ecological communities at risk, including:

- describe the proposed mitigation measures for potential adverse effects on species at risk and critical habitat, include the justification, based on scientific data, for the proposed measures;
- provide an account of how the Project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species. Mitigation measures must be compatible with any applicable recovery strategy and action or management plan and be described in terms of the effectiveness of each measure in avoiding negative effects.
- describe mitigation measures to reduce the risk of harmful, destructive or disruptive activities, including the proposed road network, in sensitive times and places of importance to species at risk;
- describe measures to prevent the release of harmful substances into waters or areas frequented or occupied by species at risk; and
- provide mitigation measures for effects on habitat, aligned with the hierarchy of mitigation measures and justify moving from one mitigation option to another.

With respect to bats:

- describe the effectiveness of the mitigation measures, taking into account the configuration of the resources in the environment and how local bat populations use these resources;
- describe how bat behaviour (differentiated by species) has been taken into account, based on the geographical location and time period; and
- at minimum, the following mitigation measures should be implemented:
 - spatial avoidance:
 - a buffer zone of 120 m is recommended;
 - for resting areas and nurseries in trees, apply a buffer zone to the entire complex of roosts and nurseries; and
 - for hibernacula, apply the buffer zone to the entire underground cave and mine system;
 - temporal avoidance (timing of disruption, destruction of resting areas or exclusion):
 - Avoid disturbance to maternity roosts and hibernacula (or areas that have the potential to contain maternity roosts or hibernacula) during sensitive periods. Consider the following general sensitive periods in the development of plans:
 - Hibernacula: October 1 to March 31
 - Maternity roosts: June 1 to July 31

- if bats are discovered in any existing infrastructure, ensure that have egressed prior to any potential or harmful activities;
- lighting:
 - avoid or minimize the use of artificial light in bat habitats;
 - select low-intensity lighting;
 - use lighting fixtures that restrict or focus illumination to target areas;
 - avoid lights that emit blue/green/white/UV wavelengths.
- follow the [Canadian National White-nose Syndrome Decontamination Protocol for entering bat hibernacula](#) (Canadian Wildlife Health Cooperative); and
- other compensation.

8.11. Climate change

The following requirements are based on the [Strategic Assessment of Climate Change](#) (SACC), developed by Environment and Climate Change Canada (ECCC). The proponent must follow the directions and guidance contained in the SACC and the technical guides related to the SACC for each information requirement listed below, including the *Draft Guidance on quantification of net GHG emissions, impact on carbon sinks, mitigation measures, net-zero plan and upstream GHG assessment* (hereafter ‘the Technical Guide’) (included in the [Strategic Assessment of Climate Change](#)). The Agency expects the proponent to keep apprised of updated technical guides related to the SACC published by ECCC.

8.11.1. GHG emissions

As described in Section 5.1.1 of the SACC, with regards to GHG emissions, the Impact Statement must provide:

- a description of each of the Project’s main GHG emission sources and their estimated annual GHG emissions over the lifetime of the Project;
- net GHG emissions by year for each phase of the Project based on a project’s maximum capacity (additional guidance at Section 2.1 of the Technical Guide);
- each term of Equation 1 (Net GHG emissions = Direct GHG emissions + Acquired energy GHG emissions - Avoided domestic GHG emissions - Offset measures), per year for each phase of the Project (additional guidance at Section 2.1 of the Technical Guide);
- emissions intensity (Equation 4 of the technical guide) for each year of the operation phase of the Project in units of kt CO₂ eq/t or equivalent (additional guidance at Section 2.1.5 of the Technical Guide);

- the quantity and a description of the "units produced" used in Equation 4 of the Technical Guide for each year of the operation phase of the Project (additional guidance at Section 2.1.5 of the Technical Guide);
- methodology, data, emission factors and assumptions used to quantify each element of the net GHG emissions (refer to Section 3.1.1 of the SACC and Section 2 of the Technical Guide);
- a discussion on the development of emissions estimates and uncertainty assessment (refer to Section 3.3 of the SACC); and
- when applicable, a description of large sources of GHG emissions that may be the consequence of accidents or malfunctions.

8.11.2. Carbon sinks

As described in Section 5.1.2 of the SACC, the Impact Statement must provide a quantitative and qualitative description of the Project's positive or negative effects on carbon sinks. Additional guidance on the methodology to estimate losses or gains to carbon sinks is available in Section 4 of the Technical Guide.

8.11.3. Impact of the Project on federal emissions reduction efforts and on global GHG emissions

As described in Section 5.1.3 of the SACC, with regards to federal emissions reduction efforts and on global GHG emissions, the Impact Statement must provide an explanation of how the Project may impact Canada's efforts to reduce GHG emissions, if applicable, but also a discussion on how a project could impact global GHG emissions, if applicable.

8.11.4. Mitigation measures and net-zero plan

In terms of mitigation measures and net-zero plan, the proponent must complete a Best Available Technologies / Best Environmental Practices (BAT/BEP) Determination that will assess potential GHG mitigation measures throughout all phases of the Project as described in Section 5.1.4 of the SACC. Additional guidance is provided in Section 3.2 of the [draft Technical Guide](#). The proponent must also provide a credible net-zero plan that would use and build off the BAT/BEP Determination to describe the mitigation measures that will be taken to minimize GHG emissions throughout all phases of the Project and achieve net-zero emission by 2050, and thereafter for the remainder of the lifetime of the Project, if project activities are determined to continue beyond 2050, as described in Section 5.3 of the SACC. Emphasis should be placed on minimizing net GHG emissions as early as possible and throughout the Project lifespan. The net-zero plan must follow the principles and include the information in Sections 3.5.1 and 3.5.2 of the draft Technical Guide, respectively, or any final version of the Technical Guide the becomes available prior to submission of the Impact Statement.

9. Health, Social and Economic Conditions

The Impact Statement must provide information on how the Project may affect health, social and economic conditions. The assessment of potential effects must include both adverse and positive effects, and must consider the resilience of Indigenous peoples and the public to the effects of the Project.

The baseline conditions established for Indigenous communities must take into account Indigenous governance regimes and Indigenous laws associated with health and socio-economic conditions. The baseline conditions must take into account GBA Plus specific to Indigenous peoples and should provide community-specific social and economic conditions on a disaggregated basis (without identifying individuals).

The proponent should refer to the following guidance [*Analyzing Health, Social and Economic Effects under the Impact Assessment Act*](#).

In addition to the specific information requirements in sections [9.1](#), [9.2](#), or [9.3](#), if—during the course of its engagement with the public or with Indigenous communities—the proponent becomes aware of potential adverse effects to health, social, or economic conditions that are not addressed in the noted sections, the Impact Statement must consider these novel effects, or provide rationale for their exclusion.

9.1. Health conditions

9.1.1. Baseline conditions

The Impact Statement must describe the current state of physical, mental and social well-being and incorporate a determinants of health approach to move beyond biophysical health considerations. In line with the World Health Organization's (WHO) expanded definition of health, a determinants of health approach recognizes that health is more than the absence of disease but rather a state of physical, mental, and social well-being.

The Impact Statement must:

- be sufficient to provide a comprehensive understanding of the state of human health;
- provide information that is sufficiently detailed to describe the pathways by which the Project's influence on the determinants of health may affect health outcomes;

- provide a comparison of data at the provincial, regional or national level, if possible, to better interpret baseline conditions;
- identify the social area of influence of the Project;
- describe how community and Indigenous knowledge from relevant populations was used in establishing baseline conditions, including input from diverse subgroups; and
- describe baseline conditions using disaggregated data for diverse subgroups and their different access to resources, opportunities and services within the community to support GBA Plus.

To understand the community context and baseline health profile for Indigenous communities, the Impact Statement must:

- develop community health profiles that reflect the overall health of each Indigenous community, where information is available, that include:
 - health outcomes of interest, such as chronic diseases, mental illness and addictions, suicide rates, injuries, rate of gender-based violence;
 - health factors of interest, such as health-related behaviours (e.g., food consumption; physical activity; problematic substance use), and mental well-being (e.g., feelings of depression; real or perceived health risks reflecting the level of chronic biological stress);
 - use, where known, secondary information sources (e.g. Public Health Agency of Canada, Statistics Canada, Indigenous Services Canada, Indigenous health authorities, provincial health authorities);
- describe any context-specific definitions of health and well-being, including from the perspective of the relevant Indigenous cultures and local communities;
- describe relevant community and Indigenous history or context, including historical impacts on health;
- present baseline information for social determinants of health by summarizing key project-relevant information on the social (cultural) and economic factors, contributing to social/community well-being, with reference to sections [9.2. Social Conditions](#) and [9.3. Economic conditions](#), including:
 - factors supporting mental health and community well-being (including perceived emotional or social stress, feelings of isolation and of concern for future generations, and changes on community cohesion); and
 - safety of Indigenous women, girls, and gender-diverse people, including the potential for gender-based violence due to factors such as in-migration of outside workers;
- document and describe the relevant protection factors that contribute to community resilience (e.g. sense of belonging, cultural continuity, language, family supports) and other social determinants of health selected specifically for Indigenous communities, contributing to social/community well-being, including subgroups within them, with reference to [Section 10. Indigenous Peoples](#);

- Illustrate the interconnections between the abovementioned factors, contributing positively or adversely to social/community well-being, and health factors related to mental and physical well-being, to identify potential interactions of effects;
- provide the approximate location on a map and distance of likely human receptors, including foreseeable future receptors, which could be affected by changes in air, water, country food quality, and noise and light levels. Include communities' gathering, hunting, trapping and fishing areas, including for Indigenous peoples' permanent residences, temporary residences (e.g. Indigenous cottages and camps identified in collaboration with Indigenous peoples) and sensitive receptors (e.g. schools, hospitals, community centres, retirement complexes, health care centres) near the Project;
- describe the access and consumption of country foods¹³ (traditional foods), which represent the link between a social determinant (i.e., food security/sovereignty) and health-related behaviours, while including what species are used, quantities, frequency, harvesting locations and how the data were collected (e.g. site-specific consumption surveys, [First Nations Food, Nutrition and Environment Study](#));
- describe the level of food security and food sovereignty within local and Indigenous communities. Refer to the [Public Health Agency of Canada's website on food security](#) and to the First Nations Food, Nutrition & Environment Study for more information;
- provide the proximity of land and resource use activities to the proposed transmission line;
- provide baseline contaminant concentrations in ambient air, drinking water and tissues of traditional foods consumed by Indigenous communities. The proponent should work with local Indigenous communities to collect tissue samples where appropriate; and
- provide a summary of identified data and explain the selection of methods for statistical analysis of available data, including identifying uncertainties and limitations of proposed methods and available data. If surrogate data from reference sites are used rather than project site-specific measurements, demonstrate how the data are representative of site conditions.

Additionally, with respect to health conditions applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- provide an overview of community health that reflects the overall health of each nearby community, where information is available,
- describe and characterize the existing health services and programs, including health care provider capacity; and
- identify and describe drinking water sources, both surface and/or groundwater (permanent, seasonal, periodic or temporary), including approximate wellhead capture zones.

¹³ Country foods refer to all foods that do not come from commercial systems. It includes all food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes or has Indigenous cultural value. Refer to [Health Canada's Guidance for Evaluating Health Impacts in Environmental Assessment: Country Foods](#): <https://publications.gc.ca/site/eng/9.855584/publication.html>

Guidance for developing the appropriate baseline information relevant to human health is identified in [Appendix 2 – Human Health](#). The proponent should refer to the Health Canada guides to ensure that best practices are followed in collecting baseline information for assessment of the Project’s impacts on human health caused by changes in air quality, noise levels, the quality of drinking water and water used for recreational purposes, traditional foods and the multiple contaminant exposure routes. The proponent must justify any omission or deviation from the recommended baseline characterization approaches and methods, including the Health Canada guidelines.

Baseline conditions must be described using disaggregated data for diverse subgroups (e.g. Indigenous people, women, youth, and elders) to support GBA Plus.

9.1.2. Effects to health conditions

The proponent must assess the potential effects of the Project on health conditions. Interconnections between health and other VCs and their potential interactions (i.e., effects pathways) as mentioned in the baseline section provide the basis on which to carry out effects assessments. 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.

The assessment of these effects to Indigenous peoples must describe and take into account interactions with the effects on physical and cultural heritage, on structures, sites or things of significance, and on the current use of lands and resources for traditional purposes. For example, an effect on a traditional food may have consequences for the practice of traditional activities and could lead to an effect on the cost of living, food security, and mental health at the community level or on vulnerable subgroups.

A dedicated Health Impact Assessment¹⁴, supported by a Human Health Risk Assessment (HHRA)¹⁵, should show an understanding of the Project’s health, social, and economic impacts, including on Indigenous peoples and will play a role in understanding the Project’s impacts on Indigenous rights and culture.

Justification should be provided if the proponent indicates that the use of a Health Impact Assessment is not warranted. In addition, a description of what methodologies and tools will be employed to determine the positive and adverse health effects of the project should be provided.

With regard to the health conditions of Indigenous people, the Impact Statement must:

- describe the health pathways of effects that the Project may have on Indigenous peoples;

¹⁴ Health Impact Assessment may be defined as a combination of procedures, methods, and tools that systematically judges the potential, and sometimes unintended effects, of a policy, plan, program or project on the health of a population and the distribution of those effects within the population

¹⁵ HHRA: assessment of the effects on the health of persons exposed to biophysical stressors, particularly increased concentrations of chemical substances present in the environment and linked to various phases of a project.

- describe, impacts to mental well-being and anxiety tied to real or perceived contamination from project activities, including cumulative impacts to mental well-being;
- consider the inclusion of Indigenous peoples in the development of community-specific socio-economic impact assessments;
- apply a Health Impact Assessment approach, including consideration of determinants of health;
- describe any potential health effects resulting from changes to project-relevant biophysical and social determinants of health¹⁶; and
- describe how Indigenous knowledge was used in assessing human health effects.

Additionally, with respect to health conditions applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- describe accumulation of contaminants in country foods and traditional foods, and the resulting impacts this has on health;
- describe any potential health effects resulting from changes to project-relevant biophysical and social determinants of health; and
- describe how community knowledge was used in assessing human health effects.

Effects to health must be described using disaggregated data for diverse subgroups (e.g. Indigenous people, women, youth, and elders) to support GBA Plus.

9.1.3. Biophysical determinants of health

With respect to the health of Indigenous people, the Impact Statement must:

- 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;
- identify other potential routes of exposure to contaminants;
- provide a detailed justification for every contaminant of potential concern (COPC)¹⁷ or exposure route that would be excluded and/or eliminated from the assessment of the human health risks;

¹⁶ The term "social determinants of health" is all-encompassing; it represents the social, cultural, and economic factors that make up the social fabric of life, as per the following standard understanding of what affects people's health: The social determinants of health (SDH) are the non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1

¹⁷ COPC: Any chemical substance for which the concentration in an environmental medium is likely to be high due to the Project's activities may first be considered as a COPC. However, if it is established that the sum of the modelled concentrations and the background concentrations is below the guidelines, standards or criteria - based on health protection - for the affected area, the statement of the problem stage of the risk assessment may conclude that it is unnecessary to treat this chemical substance as a COPC in a quantitative risk assessment.

- conduct a problem formulation exercise and/or preliminary model predictions to determine whether a HHRA is required. The proponent must provide a rationale if the problem formulation and/or preliminary model predictions indicate that a HHRA is not warranted;
 - problem formulation consists of identifying the main factors to consider. It briefly addresses the following factors:
 - identification of the boundaries of the study;
 - identification of the current and future COPCs;
 - identification of current and future human receptors;
 - identification of current and future exposure pathways;
 - development of the conceptual site model illustrating the connections existing between the COPC, the receptors and the exposure routes.
- if a HHRA is conducted, the assessment must examine all exposure pathways for contaminants of potential concern to adequately characterize potential bio physical risks to human health. A multimedia HHRA may need to be considered and conducted for any contaminant of potential concern with an identified risk and multiple pathways. Use best practices in health risk assessment methods (see Health Canada, 2019. [*Guidance for Assessing Human Health Impacts in Environmental Assessments: Human Health Risk Assessment*](#));
- provide an assessment of the carcinogenicity of diesel exhaust gases when diesel engines are a source of air pollutant emissions for the Project. In characterizing the carcinogenic risk of project-related diesel exhaust gases, the proponent has two options:
 - carry out a quantitative risk assessment of diesel emissions (i.e., calculate the associated incremental cancer risk using the associated unit risk and inhalation slope factor available from the California Environmental Protection Agency (CalEPA) in combination with model estimates of exposure to diesel emissions. Although not being expressly recognized in Canada, this approach can provide an overview of the potential impacts that a particular project may have on the risks associated with diesel emissions; or
 - provide a qualitative risk assessment of the carcinogenic risk of diesel exhaust gases related to the Project, which includes three different elements to ensure transparency:
 - identification of the main sources of diesel emissions for the Project and acknowledgement of the relative importance of diesel emissions as a source of air pollution for the Project;
 - acknowledgement that diesel emissions have been labelled a human carcinogen by international authorities such as Health Canada, WHO's International Agency for Research on Cancer, the U.S. Environmental Protection Agency and the California Environmental Protection Agency; and
 - why a quantitative assessment of the carcinogenic risk of diesel emissions for the Project is not being done;

- assess the cancer risks of human exposure to all potentially carcinogenic PAHs in the diesel mixture rather than to a single surrogate substance. (refer to Health Canada’s *Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment* (2019)).
- describe and quantify potential effects between project activities, environmental contaminants, food security (i.e., food safety and food access/availability/use), and other related factors (e.g., cultural continuity and perceived health risks,), contributing to social/community well-being, and their linkages to mental and physical well-being (e.g. depression, anxiety, real and perceived health risks, food consumption patterns, chronic biological stress);
- with regard to potential effects on food security:
 - describe changes in terms of their implications for the physical and mental health of Indigenous peoples¹⁸; and
 - identify possibilities of avoidance of certain country food sources, or drinking or recreational water sources, by Indigenous peoples due to the perception of contamination;
- describe and quantify specific thresholds used for HHRA and document if different thresholds were considered for vulnerable populations, including by sex and age. Provide a justification if any applicable threshold was not used;
- document and take into account tolerance thresholds for potential adverse effects on health identified by Indigenous peoples;
- describe any project-related changes that could result in a positive health effect (e.g. remediation projects); and
- identify any effects to human health from current and potential future Traditional Land and Resource Use activities (e.g. hunting, harvesting plants) in the close vicinity of the proposed transmission line.

Additionally, with respect to health conditions applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- provide an assessment of the potential effects on human health for all relevant phases in consideration of, but not limited to, potential changes to the environment in Section 8, including:
 - air quality;
 - noise exposure and effects of vibration;
 - light levels;
 - current and future availability and quality of country foods (traditional foods); and

¹⁸ Refer to: Health Canada, [Eating Well with Canada's Food Guide - First Nations, Inuit and Métis](#)

- current and future availability and quality of water for drinking, recreational and cultural uses;
- determine the anticipated effects of the Project on the quality and quantity of groundwater or surface water used for domestic purposes based on the strictest guideline values for the following criteria: Guidelines for Canadian Drinking Water Quality (GCDWQ), or any relevant provincial water quality standards or guidelines;
- describe how the Project-related contaminants in the water, air or soil, can be taken up in country foods (i.e. foods that are trapped, fished, hunted, harvested or grown for subsistence, cultural or medicinal purposes);
- describe, for each receptor, impacts of noise on community annoyance and sleep disturbance for construction noise lasting longer than one year and operational noise at each receptor location;
- in situations where project related air, water or noise emissions meet local, provincial 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; and identify any effects to human health from current and future land and resource use activities in the close vicinity of the proposed transmission line.

9.1.4. Social determinants of health

With respect to the social determinants of health of Indigenous people, the Impact Statement must:

- describe the potential health effects arising from the project's-relevant effects on social conditions, economic conditions, and conditions of Indigenous peoples' VCs, and their respective indicators, reflecting the input of the affected communities;
- identify and describe anticipated changes to those social determinants of health that may be related to the Project, as selected in baseline studies, with reference to Section 9.1 Health Conditions;
- describe the effects that in-migration of outside workers and out-migration may have on social determinants of health;
- describe the ways in which the potential avoidance of land near project components by Indigenous peoples due to perceived changes in environmental quality and tranquillity was considered in assessing potential effects on the diet and health of Indigenous peoples;
- describe tolerance thresholds for potential adverse effects identified by Indigenous peoples; and
- describe any positive health effects (e.g. resulting from improved economic opportunities, increased access to services).

The proponent should refer to the following guidance:

- [*Indigenous Mental Wellness and Major Project Development: Guidance for Impact Assessment Professionals and Indigenous Communities*](#); and
- [*More-than-mental health: Indigenous identity, culture, community and relationship with land are integral to Indigenous wellbeing*](#) (training manual).

Additionally, with respect to social determinants of health applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- describe the effects that in-migration of outside workers may have on the safety of women, girls and gender-diverse people; and
- identify any emotional or social stress factor that may result from the Project, particularly:
 - concerns regarding public safety during all phases of the Project, including due to accidents and malfunctions; and
 - disturbance of normal daily activities.

9.1.5. Mitigation and enhancement measures

The Impact Statement must describe the proposed mitigation and enhancement measures for any potential effects on human health.

In particular, the Impact Statement must:

- describe the mitigation and enhancement measures for Indigenous peoples and for each Indigenous community, including:
 - mitigation measures to support the safety and security of people, including ongoing measures to prevent gender-based violence;
 - mitigation and enhancement measures that may be put in place to counteract any negative health, economic and social effects on local Indigenous communities as a result of in-migration of workers; and
 - mitigation measures to help stabilize the effects of boom-and-bust cycles for improved community adaptation;
- if the level of emissions from a particular project or effluent discharge is below or at the applicable limits, identify if additional mitigation measures will still be considered. However, if the change may be substantial (even within established limits) as a result of local or regional circumstances or the extent of the change, the proponent must provide additional mitigation measures to minimize pollution and risks to human health;
- when potential effects on human health exist due to exposure to a non-threshold contaminant (e.g. certain air pollutants such as fine particulate matter and nitrogen dioxide), describe

mitigation measures aimed at reducing residual effects to as low a level as reasonably possible; and

- identify mitigation and enhancement measures presented in other sections (i.e., sections [9.2.3.](#), [9.3.3.](#)) that are also applicable to health and well-being effects.

The proponent is encouraged to refer to the National Collaborating Centre for Healthy Public Policy's publication entitled [Tools and approaches for assessing and supporting public health action on the social determinants of health and health equity](#).

9.2. Social conditions

9.2.1. Baseline conditions

With respect to social conditions of Indigenous peoples, the Impact Statement must:

- establish the baseline conditions for Indigenous communities in doing so must consider the cultural context including Indigenous governance regimes and Indigenous laws associated with health and socio-economic conditions; and
- provide community-specific social and economic conditions on a disaggregated basis (without identifying individuals).
- describe how community and Indigenous knowledge from relevant populations was used in establishing baseline conditions, including input from diverse subgroups.

Additionally, with respect to social conditions applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- describe the existing social conditions for local communities and Indigenous communities, and contrast these conditions to the provincial, regional or national levels, if possible, to better interpret baseline conditions.

Describe baseline conditions using disaggregated data for diverse subgroups (e.g. women, youth, and elders) and their different access to resources, opportunities and services within the community to support GBA Plus.

9.2.1.1. Community profile

To understand the community context, the Impact Statement must prepare community profile(s) for Indigenous communities and describe:

- influences on community well-being (e.g. rates of alcohol and substance misuse, and of illegal activities and violence; rates of gender-based violence), including indicators proposed by Indigenous communities;
- community cohesion, including level of support and engagement in community or neighbourhood, social networks and social activities;

- the socio-cultural environment, identifying Indigenous peoples and predominant cultural communities, including description of Indigenous communities; and
- relative socio-economic conditions for local and Indigenous communities using both primary source data as well as applicable information from the Community Well-Being Index: <https://www.sac-isc.qc.ca/eng/1100100016579/1557319653695>.

Additionally, with respect to social conditions applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- access, ownership and use of resources (e.g. minerals, food, water, social infrastructure);
- relevant historical community background; and
- applicable history with previous developers.

9.2.1.2. Land and resource use

With respect to the social conditions of Indigenous Peoples, the Impact Statement must describe baseline conditions of land and resource use for Indigenous peoples as described in [Section 10.2.1](#).

Additionally, the Impact Statement must describe baseline conditions of land and resource use for Indigenous peoples and the public, including:

- describe general patterns of human occupancy and of land resource use in the study area based on selected spatial and temporal boundaries (include maps, if possible);
- identify and take into account relevant local, regional, or provincial land use or resource development plans;
- describe sites or areas that are used by local people either as a permanent residence or as a seasonal/temporary location, and the number of people using each identified site or area (include a map, if possible);
- identify remote, rural and urban residential areas (including seasonally and year-round occupied establishments);
- identify parks and recreation areas including water bodies (including local and provincial parks and recognized scenic areas);
 - describe the historical connection to recreation areas and waterbodies by local land users;
- identify monitored or administered forest areas (including forests under agreement and areas designated for timber sales);
- identify registered or recognized hunting, trapping or guiding areas, recreational (e.g. hiking, wildlife viewing areas) and commercial fishing areas, or any other areas for gathering, harvesting practices and aesthetic enjoyment;
- identify water supplies, as well as water sources and intakes for industries (such as daycares), residents and municipalities; and

- describe the natural and cultural heritage, and provide maps for buildings, sites and things of historical, archaeological, paleontological or architectural significance in the study area, including land, trails, burial sites, ceremonial sites, natural features and resources considered to be heritage.

9.2.1.3. Services and infrastructure

The Impact Statement must describe the existing local and regional infrastructure facilities in the study areas for Indigenous peoples and the public, including:

- road infrastructure and traffic safety;
- railways; and
- any other potentially affected infrastructure and transportation routes.

The Impact Statement must describe the existing local and regional services in the study areas for Indigenous peoples and the public, including:

- accommodation and lodging (e.g. availability, suitability);
- existing health services and programs, including health providers' capacity; and
- all other potentially affected services.

9.2.1.4. Navigation

The Impact Statement must describe baseline conditions for navigation for Indigenous peoples and the public, including:

- identify and describe existing navigable waterways for which navigability may be impacted by the Project, including any scheduled waterways under the *Canadian Navigable Waters Act*, as well as non-scheduled waterways, and all their uses. Provide the following details when describing navigable waters;
 - physical characteristics (e.g., size, depth);
 - use of waterway (e.g., transport or travel for commercial or recreational purposes, etc.);
 - past, current and potential future use, including by Indigenous peoples;
 - access; and
 - number of waterfront owners, including the Crown (e.g., two or more);
- provide a list of potentially affected waterway users and concerns regarding waterway use and access.

9.2.2. Effects to social conditions

The Impact Statement must assess the adverse and positive effects of the Project on social conditions of Indigenous peoples and the public. Interconnections between social VCs and other VCs and interactions between effects must be described.

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. The analysis should also describe the current social conditions of local and Indigenous peoples and the public, including access to social programming. The effects assessment should explore and discuss opportunities by which benefits to local communities can be enhanced.

The proponent should refer to the Agency guidance on [Analyzing Health, Social and Economic Effects under the Impact Assessment Act](#).

9.2.2.1. Effects to community well-being

The Impact Statement must describe effects to community well-being for Indigenous peoples, including:

- consider the inclusion of Indigenous peoples in the development of community-specific socio-economic impact assessments;
- document and take into account tolerance thresholds for potential adverse effects identified by Indigenous peoples;
- describe any positive effects on well-being (e.g. resulting from improved economic opportunities, increased access to services);

The Impact Statement must describe effects to community well-being for Indigenous peoples and the public, including:

- assess potential adverse and positive effects, at the community level, of changes to social conditions including, but not limited to:
 - income inequity;
 - price and availability of housing or land;
 - changes that result from increased population (temporary or permanent);
 - changes that result from increased cost of living due to the Project;
 - changes in criminal activity and crime rates;
 - changes or stresses on community, family and household cohesion;
 - changes to use and misuse of alcohol and substances
 - changes to illegal or other potentially disruptive activities;
 - changes to economic opportunities
 - changes to access services
 - changes to gender-based violence (e.g. harassment or human trafficking); and
 - those conditions considered for analysis of determinants of health in section 9.1.4;

Apply GBA Plus 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, or other relevant subgroups (e.g. women, youth, elders).

9.2.2.2. Effects to land and resource use

With respect to the social conditions of Indigenous Peoples, the Impact Statement must describe effects to land and resource use for Indigenous peoples as described in [Section 10.2.2](#).

Additionally, the Impact Statement must describe adverse and positive effects to land and resource use for Indigenous peoples and the public, including:

- describe the potential interactions of the Project with local and regional land use and resource activities;
- describe predicted changes to land use activities or sites/areas in the local and regional study area , including to:
 - registered or recognized hunting, trapping or guiding areas, recreational (e.g. hiking, wildlife viewing areas) and commercial fishing areas, or any other areas for gathering, harvesting practices and aesthetic enjoyment
 - loss of any resources or physical or cultural heritage due to the Project, such as loss or change to the Traditional Trail (sometimes referred to as Indian Trail) , and loss of York Lake;
 - access to the resources, including entry and exit sites for watercraft, such as the Beaverhouse Lake boat launch;
 - quantity and quality of the resources; and
- overall experience when undertaking recreational activities, including due to noise or aesthetics; describe the results of engagement activities with communities having heritage resource concerns in the project area and indicate the involvement of community members, including Indigenous communities, in related studies, if applicable.

9.2.2.3. Effects to services and infrastructure

The Impact Statement must describe adverse and positive effects to services and infrastructure for Indigenous peoples and the public, including:

- describe the predicted effects to the local and regional infrastructure facilities and services in the study area, including adverse and positive effects.

9.2.2.4. Effects to Navigation

The Impact Statement must describe adverse and positive effects to navigation for Indigenous peoples and the public, including:

- Identify navigable waterways and their uses by waterway users, including Indigenous communities, and how these might change due to the Project;

- describe each project activity that may interact with navigable waterways (i.e. project components that will be constructed, operated, decommissioned, and abandoned, in, on, around, nearby, under, over, through) during all phases of the Project, including any scheduled waterways under the *Canadian Navigable Waters Act*, and where waterways would be crossed, specify the proposed crossing method;
- describe engagement with waterway users including Indigenous communities, and summarized identified issues raised and how issues were or would be addressed; and
- describe changes to navigation by waterway users, including Indigenous communities, due to the Project, including effects to access, safety, and due to the dewatering of York Lake and diversion of the Misema River.

9.2.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation and enhancement measures that will be implemented for all potential effects on social VCs.

9.3. Economic conditions

9.3.1. Baseline conditions

With respect to the economic conditions of Indigenous peoples, the Impact Statement must describe the local and regional economic conditions and trends and their impacts on Indigenous communities, including the following:

- the main economic activities of Indigenous people in the study area;
- any relevant treaty provisions pertaining to economic activities for Indigenous peoples;
- an overview of the Indigenous businesses that may provide supplies and services required for the Project, including the affiliation of those businesses, if applicable, to Indigenous communities identified in the Indigenous Engagement and Partnership Plan; and
- any current use on lands and water bodies in the study areas by Indigenous people for traditional or non-traditional economic purposes (Refer also to [10.2. Current use of lands and resources for traditional purposes](#)).

Additionally, with respect to economic conditions applicable to both the Indigenous peoples and the public, the Impact Statement must provide the following:

- an overview of the main economic activities in the study areas, including demographic information for economically active members of the local and regional population;
- any local, provincial, or federal economic development plans or funding programs for the project area, local study area and regional study area and the level of funding received by any community as a result of these initiatives;

- existing employment rates, including principal employment and economic well-being in the study areas and impacted communities;
- workforce, including the availability of skilled and unskilled workers, existing working conditions, wages and average salary range, full-time and part-time employment and training and gender gaps such as for skilled trades and in wages and qualifications; and
- the current use of lands and water bodies for economic activities in the study areas including hunting, recreational and commercial fishing (including catch rates, visitation rates, and angling days, number of licenses, value of fisheries), trapping, outdoor recreation, use of seasonal cabins, outfitters, and forestry.

Baseline conditions must be described using disaggregated data for diverse subgroups (e.g. Indigenous people, women, youth, and elders) and their different access to resources, opportunities and services within the community to support GBA Plus.

9.3.2. Effects to economic conditions

With respect to the economic conditions of Indigenous peoples, the Impact Statement must describe potential positive and adverse economic effects of the Project on Indigenous people. In support of the overall net benefits assessment of the Project, the Impact Statement must describe the potential positive and adverse effects in the local and regional economies (for Indigenous peoples and the public). The assessment of economic effects should take into consideration the temporal scale for construction, operation and beyond, and the potential for boom-and-bust cycles associated with the Project.

9.3.2.1. Employment

With respect to the economic conditions of Indigenous peoples and the assessment of overall net benefits of the Project applicable to both Indigenous peoples and the public, the Impact Statement must:

- describe the potential changes in employment including the following aspects:
 - an estimate of the direct, indirect and induced employment at each phase of the Project (including an estimate of the full-time equivalent (FTE) employment during all phases of the Project and an estimate of full- and part-time employment);
 - an estimate of direct, indirect or induced income or wages;
 - a description of the types of employment likely to be in demand;
 - an estimate of the ability of the local and regional labour market (including Indigenous participants in the labour market) to meet demand, to the extent practicable indicate the affiliation of the participants to Indigenous communities identified in the Indigenous Engagement and Partnership Plan;
 - an analysis of the potential for labour shortages in certain sectors as a result of after the Project;

- an estimate of introduced works into the local and regional labour market to support the Project;
- any potential long-term changes to the local and regional labour markets as a result of this project, such as the creation of dependency and reliance on the mining industry;
- describe the potential changes in training including:
 - provision of training to the local and regional population to ready them for employment at the Project, including provision of funding. Please specify target populations such as youth, Indigenous people as well as the sources of funding (the Proponents versus government programs);
 - potential economic effects from training related to the Project;
- describe the GBA Plus aspects of employment, including;
 - the potential effects on employment for Indigenous people, women and other diverse subgroups, including any actions that will be taken to increase the employment of these subgroups in the Project, including training programs; and
 - the Project's diversity and inclusion workforce plans, policies and practices.

9.3.2.2. Business environment and local economy

With respect to the economic conditions of Indigenous peoples, the Impact Statement must:

- describe, if applicable, any actions to increase procurement from local or regional Indigenous businesses, and from businesses owned by Indigenous women, or other diverse subgroups;
- provide an estimate of the anticipated levels of local and regional economic participation in the Project for Indigenous communities in comparison to the total project requirements (e.g., total dollar value of contracts);
- describe the effects of the Project on the local Indigenous economy overall, including:
 - an estimate and description of direct, indirect and induced economic effects of the Project on Indigenous people during each phase of the Project as well as any that may remain beyond the life of the Project; and
 - the sources and methodologies used for developing multipliers and estimates and, where a generic multiplier may not accurately reflect the specific situation of the Project, provide evidence of specific economic activity that will result from the Project going ahead;
- describe situations when the Project may directly or indirectly create economic hardships for Indigenous people or the displacement of Indigenous businesses;
- estimate the potential effects of the Project on the traditional economy, including the potential loss of related jobs;

describe the potential effects of changes to economic conditions for specific sectors in affected Indigenous communities related to traditional use of lands and resources including tourism (refer to sections 7.6 [Cumulative effects assessment](#), and 10.2 [Current use of lands and resources for traditional purposes](#))

Additionally, the Impact Statement must support the assessment of overall net economic benefits of the Project applicable to both the Indigenous peoples and the public:

- provide details regarding investments in each phase of the project and total investment, including a forecast of capital and operating costs;
- describe economic benefits and costs to local, provincial, and national economy for each phase of the project;
 - information on revenues from tax levies, royalties, changes to GDP, development of new technologies or intellectual property, etc;
 - indicate whether a revenue/benefit sharing agreement is under consideration or under discussion (details are not necessary);
 - impacts to specific sectors, such as forestry and logging; fishing, hunting, and trapping; commercial outfitters; commercial recreation and tourism; etc;
 - describe potential effects of changes to land and resources used in local economic activity;
 - describe where the project may directly or indirectly create economic hardships or displacement of business, including Indigenous businesses;
- provide information on the economic viability of the project, in consideration of the merger with Kirkland Lake Gold, to support the net benefits assessment;
- describe the methodologies and assumptions used to estimate the economic benefits of the project including:
 - forecasts of relevant commodity prices used, where these were acquired and, if available, how they were forecasted;
 - relevant sources of uncertainty in the estimate;
 - sensitivity analysis of how changes in global competitiveness of the project, commodity prices, capital and operating costs or other relevant sources of uncertainty may affect the estimated economic benefits;
- describe any environmental, social, and governance risks to project economics, and
- describe any financial liability and compensation in place, as required by regulation or by the proponent's commitments, in relation to decommissioning or abandonment.

The assessment of economic effects should apply GBA Plus to describe the circumstances in which diverse subgroups could suffer more adverse effects or receive fewer benefits related to the Project. The economic information provided will be made publicly available and should not contain confidential business information.

9.3.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation and enhancement measures that will be implemented for all potential effects on economic conditions, including, with respect to the economic conditions of Indigenous peoples and the net benefits assessment:

- describe plans, programs and policies to encourage contracting and procurement opportunities for Indigenous peoples;
- describe supplier network development initiatives, including the identification of potential Indigenous suppliers, and plans to provide them with information on technical, commercial and other requirements, and to debrief unsuccessful bidders;
- describe any procurement policies that facilitate the opportunities for Indigenous companies;
- describe technology transfer and research and development programs that will facilitate the use of Indigenous suppliers of goods and services and Indigenous employees, and that will develop new capabilities related to project requirements;
- where appropriate, describe financial liability and compensation in place as required by regulation or by the proponent's commitments, in relation to decommissioning or abandonment; and
- describe and justify the need for compensation plans to mitigate potential effects on social and economic VCs related to Indigenous peoples.

Additionally, with respect to economic conditions applicable to both the Indigenous peoples and the public, the Impact Statement must:

- identify and describe opportunities for enhancing positive effects, such as creation of Indigenous employment and local employment and, including :
 - education, training and hiring practices that encourage employment of Indigenous people and local people;
 - actions taken to increase access to education and training opportunities for different groups (e.g. provision of transportation, flexible hours); and
 - training, education, and scholarship programs that the proponent plans to support in order to improve employment opportunities, including participation in and contribution to local training networks. Specify the types of employment targeted by these programs, as well as the targeted clientele, such as local residents, and various relevant subgroups (e.g. Indigenous people, youth and women);
- cultural competency training plans for non-Indigenous employees to ensure a respectful working relationship with Indigenous contractors and to promote a safe work environment that fosters the well-being of Indigenous employees;

The consideration of mitigation and enhancement measures should elaborate on the potential of the Project to benefit community members in relevant subgroups; including Indigenous people. Where appropriate, describe financial liability and compensation in place as required by regulation or by the proponent's commitments, in relation to decommissioning or abandonment.

10. Indigenous Peoples

The Impact Statement must provide information on how the Project may affect Indigenous peoples, as informed by Indigenous communities involved in the assessment. The proponent should apply Agency guidance on engaging with Indigenous communities and appropriate methodologies for assessing potential effects and impacts on Indigenous peoples and their rights.

The assessment of potential effects must include both adverse and positive effects to the current use of lands and resources for traditional purposes, to physical and cultural heritage, to structures, sites or things of historical, archaeological, paleontological or architectural significance, and to environmental, health, social, cultural and economic conditions of Indigenous peoples affected by the Project.

Proponents must engage with Indigenous communities, in order to identify and understand the potential impacts of their projects on Indigenous peoples and their rights, and to incorporate Indigenous knowledge into the impact assessment. Indigenous VCs may be holistic in nature and may encompass the effects on a number of individual environmental, health, social or economic value components. Where holistic VCs are identified, the proponent must combine the analysis of individual VC into an assessment of the holistic VCs identified by Indigenous communities.

Engagement with Indigenous communities is also required to identify proposed measures to avoid, minimize, offset or otherwise accommodate for potential impacts on Indigenous peoples or their rights. This engagement may also identify potential positive outcomes, including enhancement measures that could improve the underlying baseline conditions that support the exercise of rights. Ideally, the Project will be designed to minimize negative effects and to maximize positive impact on the quality of life of Indigenous peoples.

Engagement with Indigenous communities must involve ongoing information sharing and collaboration to the extent possible to help validate the information and assessment findings in the Impact Statement. In cases where a specific study addressing elements relevant to the impact assessment of the Project has been prepared by an Indigenous community, the proponent must incorporate it into the Impact Statement and explain how it was taken into account. In addition, the proponent must append the full studies, as they were presented by each Indigenous community, except in cases where the information could be confidential in nature.

The proponent must provide an opportunity for Indigenous communities to review the information prior to submission of the Impact Statement. If the information is about an Indigenous community, they must be afforded the opportunity to comment on the information in the Impact Statement and their comments should be included. The Impact Statement must indicate where input from Indigenous communities has been incorporated, including Indigenous knowledge. To the extent possible, information should be specific to the individual Indigenous community(ies) involved in

the assessment, and describe contextual information about the members within an Indigenous community (e.g. women, men, elders, and youth).

The proponent is also encouraged to work with Indigenous communities who demonstrate an interest in drafting sections of the Impact Statement that concern them, including sections describing Indigenous knowledge, on the subject of current use of lands and resources for traditional purposes, on potential impacts to the rights of Indigenous peoples, and for the identification of mitigation or enhancement measures. Where applicable, sections of the Impact Statement prepared by Indigenous communities must be clearly identified. All perspectives and the rationale for different conclusions should be documented in the assessment report.

Where Indigenous communities do not wish to participate, the proponent should continue sharing information and analysis with the Indigenous communities of the potential effects of the Project, to document its efforts in that respect, and to use available public sources of information to support the assessment.

10.1. Indigenous physical and cultural heritage, and structures, sites or things of significance

10.1.1. Baseline conditions

The Impact Statement must include a description of the baseline conditions associated with physical and cultural heritage and structure, site or thing of historical, archaeological, paleontological or architectural significance for Indigenous peoples. This description should give consideration to an understanding of the 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).

Information on heritage and structures, sites and things of significance for Indigenous peoples can include:

- burial sites;
- spiritual sites, including rivers and watercourse;
- cultural landscapes;
- oral histories;
- teaching areas used to transfer knowledge between generations;
- cultural values and experiences on the land;
- Indigenous governance systems and Indigenous laws tied to the landscape;
- toponymy, language and other components that make up a culture
- sacred, ceremonial or culturally important places, plants, animals, objects, beings or things;

- places with archaeological potential or artefacts; and
- site occupied historically.

The Impact Statement must:

- describe the interconnections and impact pathways between heritage and cultural structures, sites, places, and things and the current use of lands, health, social, and economic components, Indigenous knowledge, and Indigenous rights for each potentially -impacted Indigenous community, including intergenerational impacts over the lifetime of the Project;
- describe how historical and current cumulative effects to environmental and socio-cultural conditions, including changes to those conditions, have already impacted physical and cultural heritage;
- include components of the environment identified by Indigenous communities as having heritage value, to reflect that natural and cultural heritage is a multidimensional concept which is not limited to particular sites or objects;
- provide the location of physical and cultural heritage features on maps, if it has been shared by Indigenous peoples with the proponent and if the proponent has obtained permission from the Indigenous communities for the information to be shared publicly;
- describe how input from potentially impacted Indigenous communities was sought and considered in the identification of these locations and features, including opportunities provided to participate in or lead historic resources studies (including field studies); and
- describe the existing baseline cultural heritage conditions within the project area, local study area and regional study area by identifying all known or potential built heritage resources and cultural heritage landscapes, including a historical summary of the study area.

The proponent should consult the [Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing](#) on the Agency's Website.

10.1.2. Effects to Indigenous physical and cultural heritage

The Impact Statement must:

- assess potential effects to physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance to groups, including, but not limited to:
 - loss or destruction of physical and cultural heritage;
 - changes to access to and/or experience with 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, species, or things, including languages, stories and traditions;

- changes to the ability to maintain and transmit culture to future generations; and
- changes to visual aesthetics over the life of the Project and post-project decommissioning or abandonment.
- identify preliminary potential project-specific impacts on the known and potential built heritage resources and cultural heritage landscapes. Include a description of the anticipated impact to each known or potential built heritage resource or cultural heritage landscape;
- in the event that project activities may disturb the soil, on the surface or underground, is carried out on provincial Crown lands, conduct an archaeological potential study for the Crown territory affected, in consideration of provincial legislation. Based on the recommendations of this study, field work (visual inspection without snow cover, archaeological inventory, or other) could be necessary. Depending on the findings, this expertise could lead to mitigation measures related to the findings obtained, which can take the form, for example, of intensive digs at a given site or a proposal for modification of the anticipated route;
- take into account potential effects on physical and cultural heritage when assessing the effects on social and economic conditions;
- explain the interconnections with and potential impacts to physical and cultural heritage from changes to pre-development and current baseline environmental, health, social, and economic conditions;
- describe the outcomes of engagement and consultation activities with Indigenous communities with concerns about heritage resources in the project area and indicate the participation of the members of these communities in the related studies, if applicable;
- describe how Indigenous knowledge informed studies, including the identification of the sites to assess and include studies conducted by Indigenous peoples, if any;
- consider natural and cultural heritage as a multidimensional concept which is not limited to particular sites or objects and which can also include components of the environment identified by Indigenous peoples as having heritage value; and
- list any other effects highlighted by Indigenous communities, if applicable.

The proponent should consult the Agency's [*Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012*](#).

10.2. Current use of lands and resources for traditional purposes

10.2.1. Baseline conditions

The Impact Statement must include information on the current use¹⁹ of lands and resources for traditional purposes. The proponent should refer to the [Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012](#), on the Agency's website.

Where information is publicly available or provided by Indigenous communities, the Impact Statement must identify and describe:

- Indigenous governance systems and Indigenous laws associated with the current use of lands and resources for traditional purposes;
- the location and description of Treaty lands and/or geographic extent of Treaty rights, title area, land claims or traditional territory (including maps where available);
- the location of reserves and communities;
- resources important for traditional and cultural purposes (e.g. plants, fish, mammals, birds, medicines and other natural resources) including:
 - species at risk;
 - country foods (traditional foods) consumed by Indigenous groups; and
 - waterways, water bodies, springs, wetlands, and shallow groundwater used as drinking water sources and aesthetic properties (taste, colour, clarity, temperature, odour) of those waters;
- access to identified resources (e.g. physical access to harvest specific species, culturally important harvesting locations, timing, seasonality, distance from community);
- the traditional and cultural significance of identified resources;
- the quality and quantity of identified resources (e.g. preferred species and perception of quality);
- the current use of lands and water bodies for traditional purposes, including:
 - hunting, trapping, fishing, gathering or harvesting practices and activities for plants, fish, mammals, birds, medicines or other natural resources (e.g. such as hunting and trapping areas for fur-bearing animals, bait harvesting and fishing areas and berry and tea harvesting areas);
 - rotational harvesting practices and how they vary in time;

¹⁹ uses that may have ceased due to external factors should also be considered if they can reasonably be expected to resume once conditions change.

- uses of riverbanks, shorelines, waterways and water bodies navigable by Indigenous peoples, such as for travel and recreation (e.g. canoe route and portage trails), including entry and exit/landing sites for watercraft;
- for social and ceremonial purposes as well as gathering or teaching grounds;
- for traditional economic purposes (refer also to [9.3. Economic conditions](#)); and
- other current uses for traditional purposes identified by Indigenous communities.
- context for traditional practices including:
 - the frequency, duration or timing of traditional practices;
 - access and travel routes for conducting traditional practices (e.g. physical access to harvest specific species, timing, seasonality, distance from community);
 - important features for 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
 - efforts by Indigenous communities to restore traditional practices.
- locations of resources and traditional practices (include a map, if possible):
 - places where resources important for traditional and cultural purposes (e.g. plants, fish, mammals, birds, medicines and other natural resources) are located including species at risk, traditional foods, drinking water sources and navigable waterbodies;
 - places where resources are harvested including culturally important harvesting locations;
 - camps, cabins and staging areas, including those used for hunting, trapping and fishing;
 - gathering and teaching grounds for social or ceremonial purposes; and
 - for locations identified for traditional practices, identify whether it is used either as a permanent residence or as a seasonal/temporary location, and the number of people using each identified site or area.
- the location of any Indigenous-led research or monitoring activities;
- any traditional activities for economic purposes (refer also to Section [9.3. Economic conditions](#)); and
- other current uses identified by Indigenous communities.

The information should be provided in sufficient detail to allow analysis of the effects to Indigenous peoples that result from changes to the environment and on health, social and economic conditions.

10.2.2. Effects to current use of lands and resources for traditional purposes

The Impact Statement must:

assess the potential effects on current use of lands and resources for traditional purposes, within the context of historical and current cumulative effects for all phases of the Project, including:

- current and future availability and quality of country foods (traditional foods);
- quality, quantity and distribution of resources available for harvesting (e.g. species of cultural importance, traditional and medicinal plants);
- access to culturally important harvesting areas or resources, to the distribution and availability of harvested wildlife (e.g. wildlife avoidance), access to traditional territory and to/from the community and reserves;
- the use of travel ways, navigable waterways and water bodies, including entry and exit/landing sites for watercraft, such as the Beaverhouse Lake boat launch;
- experiences of being on the land (e.g. changes in air quality, noise exposure, effects of vibrations from blasting or other activities, increase in artificial light at permanent and temporary sites, fragmentation of traditional territory, visual aesthetics, odor, and any corollary wellness impacts as a result of these sensory changes);
- sites of interest to communities including for commercial and non-commercial fishing, hunting, trapping and gathering and cultural or ceremonial activities and practices;
- economic burdens of, and increased time for, travelling further to hunting, fishing, trapping, and gathering opportunities;
- describe how information about effects to current land and resource use is integrated into section 10.1.2. including how:
 - changes to the access, cabins, travelways and harvesting and traditional land and resource use areas affects cultural values, mental health, spirituality or importance attached to physical and cultural heritage sites;
 - changes to traditional use of cultural landscapes including important travelways, waterways and harvesting areas associated with sacred, ceremonial or culturally important places, objects or things, use of place names, languages, stories and traditions;
 - changes to visual, auditory or olfactory aesthetics over the life of the Project and after decommissioning or abandonment of the Project affects traditional use; and
 - impacts to harvesting and traditional use affects teaching and knowledge transfer between generations;
- describe how traditional land and resource use and cultural values informed the biophysical assessment and impact rating criteria;
- describe potential effects from increased population from in-migration of workers on traditional hunting, fishing, trapping, harvesting and gathering activities;
- describe potential effects on the transmission of traditional knowledge, language, community tradition of sharing and community cohesion linked to activities potentially affected by the Project;

- take into account expectations pertaining to the preservation of landscapes, including nighttime landscapes and, if applicable, regulatory requirements and best practices in place concerning light pollution (the proponent needs to work with communities to ensure that any standards that are applied are protective of traditional uses and purposes and human health);
- describe the methods used to collect information on traditional use of lands and resources by Indigenous communities;
- describe how the traditions, perspectives, values and knowledge of Indigenous communities have been considered in determining the severity of the Project's contribution to current cumulative effects to environmental and socio-cultural conditions affecting Indigenous land and resource use (refer to Section 7.6 [Cumulative effects assessment](#));
- describe how the results of the biophysical assessment were integrated in the traditional land and resource use assessment and considered in the determining residual effects and the severity of impacts;
- provide a detailed explanation of how comments from Indigenous communities and Indigenous knowledge informed the assessment of potential effects to current use of lands and resources for traditional purposes;
- describe all reasonable alternatives considered that would avoid impacts on current use of lands and resources for traditional purposes considered during project development;
- describe and assess the interconnections and impact pathways between the current use of lands and resources and health, social, and economic components, Indigenous knowledge, and Indigenous rights for each Indigenous community, including potential intergenerational impacts over the lifetime of the Project;
- describe potential effects on current use on lands and water bodies in the study areas by Indigenous people for traditional economic purposes (refer also to 9.3. Economic conditions); and
- other current uses and effects identified by Indigenous communities or other participants, if applicable.

10.3. Rights of Indigenous Peoples

10.3.1. Baseline conditions

The Impact Statement must:

- identify and describe the Treaty and/or Aboriginal rights of Indigenous peoples potentially affected by the Project, including historic, regional, and community context, the geographic extent of traditional territory, the purpose and importance of the rights to the rights-bearing communities (e.g. the practices, customs, beliefs, worldviews and livelihoods), and information on how rights have already been affected. The description should include maps,

when available and permitted by the respective Indigenous communities, to illustrate the location of treaties, traditional territories and Métis harvesting zones;

- document the nature and extent of the exercise of rights of Indigenous peoples, potentially impacted by the Project, as identified by the Indigenous community(ies);
- consider how the information requirements related to physical and cultural heritage, current use, Indigenous health, social, and economic conditions are applicable to the nature and extent of the exercise of rights; and
- consider how the information requirements related to cumulative effects are applicable to the baseline conditions supporting the exercise of rights.

Indigenous communities may also provide their perspective through consultations with the Agency and through the establishment of information requirements included in the Tailored Impact Statement Guidelines. Indigenous communities must be involved in the baseline characterisation of conditions supporting the exercise of rights, as well as the scoping and assessment of the nature and extent of the exercise of rights of Indigenous peoples.

The information related to the rights of Indigenous peoples may include, but is not limited to:

- a general description of the rights of Indigenous peoples potentially affected by the Project, including the historic, regional and community context. The description should include maps, when available, to illustrate the location of areas with titles, land claims and traditional territories;
- 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, social and cultural conditions that support the Indigenous community's exercise of rights (e.g. large, intact and diverse landscapes, areas of solitude; connection to landscape, sense of place; language; Indigenous knowledge; clean water, biodiversity, abundance, distribution and quality of wildlife and vegetation);
- Indigenous governance systems and Indigenous laws associated with the exercise of rights;
- where possible, information about members within an Indigenous community, and their role in the exercise of rights (e.g. women, men, elders, youth, people with disabilities);
- how the Indigenous community's cultural traditions, laws and governance systems, social values, access and patterns of occupation and preferences 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).

The proponent should consult Agency guidance on engaging Indigenous communities, and the [*Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples*](#).

10.3.2. Impacts on rights of Indigenous peoples

The Impact Statement must describe the level of engagement with Indigenous communities regarding potential impacts of the Project on the exercise of rights, and where possible, the Project's potential interference with the exercise of rights. In some instances, the proponent may adopt Indigenous-led assessment of impacts on rights, and include them directly in the Impact Statement.

It is preferable that Indigenous communities have all the information about the Project and its potential effects on hand to be able to assess the potential impacts of the Project on their rights. The proponent is therefore encouraged to share studies with Indigenous communities prior to assessing the impact of the Project on their rights. The proponent must document the approach taken to support Indigenous communities in identifying the potential impacts of the Project on their rights, including the hypotheses put forward on the potential effects. Specific Indigenous communities should be provided the opportunity to review assessments of impacts on rights pertaining to those same Indigenous communities. Indigenous communities should also be provided the opportunity to approve use of Indigenous knowledge pertaining to those same Indigenous communities, prior to submission of the Impact Statement to the Agency.

Where an Indigenous community has not provided its views on the impact of the Project on their rights 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 Agency or the review panel, the proponent should describe a rationale for the approach taken to assessing impact on rights. Proponents should discuss with Indigenous communities their views on how best to reflect the assessment of impacts on rights in their Impact Statement. Impacts on rights may be assessed using a methodology identified by Indigenous communities, including community-led assessments, and agreed upon between the Indigenous community and the Agency. This may include supporting Indigenous-led studies and assessments to inform the assessment of effects to Indigenous peoples including on their ability to practice their rights and the resources necessary to support those rights (e.g. for VCs, spatial and temporal boundaries, community health, social conditions and community well-being) that are to be provided publicly and to the Government of Canada.

The proponent must work together with Indigenous communities 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 must:

- document the Project's potential impacts on the exercise or practice of the rights of Indigenous peoples or the rights arising from treaties in the project area, as expressed by potentially impacted Indigenous peoples;
- describe the impact on the rights of Indigenous peoples, taking into account the concept of the link between resources, access and experience;
- document the views of potentially affected Indigenous peoples regarding the severity of impact that the Project could have on their rights and interests; and
- describe how the results of the traditional land and resource use assessment, the cultural heritage assessment, health and socio-economic assessment of Indigenous peoples were integrated in the assessment of impacts on the exercise of rights of Indigenous peoples and considered in the determining residual effects and the severity of impacts.

The proponent should consult the following Agency guidance on this topic: the [Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples](#) and the [Guidance on Assessing Potential Impacts on the Rights of Indigenous Peoples](#).

The proponent, in collaboration with Indigenous communities, should consider the following factors, as relevant:

- how the Project may contribute cumulatively to any existing impacts on the exercise of rights, as identified by the Indigenous community(ies);
- the interference of the Project on the quality and quantity of resources available for the exercise of rights;
- how the Project affects the ability to travel freely in the territory;
- the effects of the Project on the access to areas important to the exercise of rights;
- the effects of the Project on the experience associated with the exercise of rights, including the ability of Indigenous communities to exercise their rights in a peaceful manner(e.g. without changes in connection to land, well-being, knowledge of the landscape, air quality, noise exposure, effects of vibrations, artificial light, fragmentation, visual aesthetics, safety);
- the effects of the Project on Indigenous traditions, laws and governance;
- how the Project will affect the planning, management or stewardship of traditional lands and resources by Indigenous peoples;
- how the Project will affect the ability of Indigenous peoples to derive future economic benefits from the land or water or to maintain an ongoing relationship with the land or water;
- the way that the Project is aligned with the values, political direction and/or objectives of Indigenous peoples' actions to mitigate or to adapt to a changing climate;
- the manner in which the Project and its impacts weaken or strengthen the authority of Indigenous peoples on their territory;

- how the Project affects all other components of significance identified by Indigenous communities; and
- the severity of the impacts on the exercise of rights, as identified by the Indigenous communities.

10.4. Mitigation and enhancement measures

The Impact Statement must:

- describe measures to avoid or mitigate potential negative impacts to known or potential built heritage resources and cultural heritage landscapes. The proposed mitigation measures are to inform the next steps of project planning and design;
- describe the proposed mitigation and enhancement measures for all potential effects to Indigenous peoples, as well as for potential impacts on the rights of Indigenous peoples, and identify if these are measures for which the proponent or other parties would be responsible;
- describe all mitigation and enhancement measures proposed for potential effects to Indigenous peoples and impacts on the rights of Indigenous peoples, and elaborate on how these measures may vary for each Indigenous community or peoples;
- describe if and how these measures will be integrated into the project design, if applicable;
- include perspectives of the potentially impacted Indigenous communities, on the effectiveness of particular mitigation measures on such impacts;
- describe collaboration with Indigenous peoples to identify preferred mitigation measures for potential adverse impacts on Indigenous communities or their rights, as well as to optimize the Project's benefits for their communities;
- demonstrate how the timing of Indigenous activities on the land was considered when establishing the schedule for project activities;
- provide any intervention and communication plans, as applicable, pertaining to heritage resources and structures, sites, and things of cultural, historical, archaeological, paleontological, or architectural significance, if there is a possibility of discovery during construction or development activities. This plan must include, at a minimum, the person to be contacted, intervention measures and the conditions that would lead to a shutdown and resumption of work;
- describe the measures that will be implemented by the proponent for the potential impacts of the Project on the exercise of rights, including how the measures directly address the possible impacts of the Project on the exercise of rights and the scope of the measures;
- describe the measures that would enhance or support the exercise or practice of rights in the project area (e.g. employment, procurement and monitoring measures);

- describe how the proponent has addressed the suggestions and recommendations made by potentially affected Indigenous peoples including where Indigenous knowledge was provided and considered in respect of the design of mitigation measures;
- propose differentiated mitigation measures, if applicable, so that adverse effects including racism, discrimination and sexual harassment do not fall disproportionately on Indigenous communities and vulnerable subgroups, and they are not disadvantaged in sharing any positive effect resulting from the Project. These mitigation measures should be developed in collaboration with the potentially affected communities and subgroups;
- describe how the GBA Plus results on disproportionate effects have been used to inform mitigation and enhancement measures;
- describe predicted climate change considerations for VCs and incorporate climate change adaptation into reclamation planning;
- describe the measures that would return the site to a state that is safe and productive for traditional use activities, such as hunting, fishing, and gathering of traditional medicines during the decommissioning and abandonment phases;
- describe accommodation, mitigation and complementary measures for impacts to previously known heritage and structures, sites, and things of significance, or those identified in the course of impact assessment and other field studies; and
- provide available evidence of the effectiveness for all mitigation measures related to potential effects to Indigenous communities. Where no evidence exists, describe plans to monitor the effectiveness of mitigation measures. The proponent is encouraged to share results with Indigenous communities and to monitor the effectiveness of mitigation measures in cooperation with Indigenous communities.

Where no mitigation measures are proposed or mitigation is not possible, the Impact Statement must describe the potential adverse impacts on the rights of Indigenous peoples, as identified by the Indigenous community(ies). In addition, the Impact Statement must include perspectives of the potentially impacted Indigenous communities on the effectiveness of particular mitigation measures on such impacts.

11. Effects of Potential Accidents or Malfunctions

The failure of certain works caused by technological malfunctions, human error or exceptional natural events (e.g. flooding, earthquake, forest fire) could cause major effects. If certain events are expected to occur (e.g. minor spills, road accidents), they should be included as expected effects in the previous sections.

11.1. Risk assessment

The Impact Statement must:

- identify hazards for each project phase that could lead to events of accidents and malfunctions related to the Project (e.g. structural failure of the open pit, crown pillar, tailings storage facility, or water diversion infrastructure) and provide an explanation of how these events were identified (e.g. information sources, recognized risk assessment methodology, professional expertise, similar project, participants' input);
 - take into account the lifespan of different project components, design of different project components, complicating factors such as weather or external events, and the potential for vandalism or sabotage;
- conduct an analysis of the risk of each hazard and adverse event (including likelihood and consequences) and describe the potential consequences (including the environmental, health, social and economic effects and effects to Indigenous peoples);
- describe the plausible worst-case scenarios and the more-likely but lower-consequence alternative scenarios, including;
 - the magnitude, duration and extent of effects;
 - the quantity, mechanism, rate, form and characteristic of contaminants, greenhouse gases and other materials released or discharged into the environment;
 - influence of local and regional terrain, topography and weather conditions (e.g. difficult access for interventions);
 - modelling for any contaminants spilled or released indirectly into water or air;
 - potential environmental, health, social and economic effects, including effects to Indigenous peoples. With respect to human health specifically, consideration should be given to potential pathways of effects associated with surface water, air, country foods, and other relevant media, including short-term and long-term risks to human health;
 - relative locations of sensitive receptors (e.g. humans, fish and/or wildlife and their habitat, waterways, private drinking water wells);

- timing related to sensitive receptors (e.g. migration and nesting periods of migratory birds, spawning periods for fish, hunting season, tourist season);
- critical infrastructure, such as local drinking water treatment plants or facilities that can treat water sources affected by the Project, as well as the ability and capacity of the drinking water treatment plants or facilities to treat water sources affected by accidental releases from the Project during all project phases;
- 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; and
- provide environmental sensitivity mapping that identifies site-specific conditions and sensitive receptors adjacent to project activities, including shores, streams and wetlands frequented by fish and / or migratory birds, and likely routes to them. Shoreline classification surveys and mapping must be conducted along major waterways where large spills are possible.

11.2. Mitigation measures

The Impact Statement must:

- describe the mitigation measures and safeguards that would be in place to avoid and prevent accidents and malfunctions, including project design choices and operational considerations, including engineering, safety and risk reduction standards, criteria and approaches to be used (e.g. spacing, fire protection, prevention of leaks of toxic chemicals, active fire suppression, explosion/overpressure minimization, and a spill prevention plan);
- describe the proposed security measures to reduce the potential for vandalism or other malicious acts that could lead to accidents or malfunctions;
- describe the mitigation measures for the potential adverse environmental, social and economic effects, along with implications for health effects, including effects to Indigenous peoples, in the event of an accident or malfunction, such as emergency response and repair procedures that would be put in place;
- describe long-term monitoring and recovery measures, including adaptive management plans, that would be implemented to manage effects to the environment and health, social and economic conditions, including effects to Indigenous peoples, that take into account site-specific conditions and sensitivities, from accidents and malfunctions, including those to remediate affected lands and waters;
- describe financial liability and compensation measures in place pursuant to regulations or the proponent's commitments, in case of potential accidents or malfunctions associated with the Project;
- describe mutual aid arrangements in the event that the incident exceeds proponent resources and how to access these resources; and

- describe the expected effectiveness of the mitigation measures, safeguards and response measures and systems

11.3. Emergency management

- The Impact Statement must describe an emergency response plan and as part of this plan must:
 - identify emergency planning and emergency response zones;
 - present preliminary emergency measures to respond to such events, including identifying associated response systems and capabilities;
 - take into account evacuation areas in the planning of emergency measures as well as the particularities linked to these areas (e.g. number of residents varying with the seasons, possible high number of individuals unfamiliar with the region, limited communication means in remote areas and with temporary residents);
- 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. The spatial boundaries identified for effects from potential accidents and malfunctions will generally be larger than the boundaries for the project effects alone;
- describe how the proponent will integrate its response operations into an incident management system (for example, the Response Command System, ICS) when deploying a significant incident response effort;
- describe the role of the proponent in the case of spill, collision, fire, explosion or other accidents or malfunctions associated with the Project;
- describe emergency response training and exercise programs, including a description of the participation and training agreements with Indigenous communities or communities that could be impacted by accidents or malfunctions;
- document spill response strategies for each type of spill scenario, including strategic locations of spill response equipment relative to likely accident and malfunction sites and/or likely pathways to sensitive environmental receptors;
- describe emergency communication and public notification plans, community awareness plans and public reporting, including plans for translations into French or Indigenous languages;
- describe emergency communication plans that would provide emergency instructions to surrounding communities, including Indigenous communities, and how these will be informed by the public and Indigenous communities. The proponent should consider including:
 - immediate urgent actions, such as notifying the public of security and safety concerns, instructions for on-site shelter or shelter-in-place, procedures and evacuation routes; and



- longer-term actions, such as a general website and telephone helplines, updates on the status of incidents, injured animal reports, etc.;
- describe liaison and continuous education plans linked to emergency preparedness for surrounding communities that may be affected by the consequences of a significant incident, including for Indigenous communities;
- explain how the proponent has made and will continue to make an outreach effort to ensure public and Indigenous communities understanding the risks associated with this type of project (e.g. providing non-technical information, providing information in local languages if requested); and
- describe any waste management plan as it pertains to waste generated during an emergency response.

12. 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 could adversely affect the 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) taking into account how these could change under a range of potential future climate scenarios. 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 must:

- describe how environmental conditions, including natural hazards such as severe and/or extreme weather conditions and external events, could adversely affect the Project and how this in turn could result in effects to the environment, health, social and economic conditions;
- describe whether cumulative effects were considered;
- provide details of planning, design and construction strategies intended to minimize the potential adverse effects of the environment on the Project;
- provide water management plans and design flood of the Project infrastructure;
- describe mitigation measures that can be implemented in anticipation or in preparation for effects of the environment on the Project;
- indicate any commitment to design infrastructure to the 1 in 100 year, 24-hour storm event;
- indicate what monitoring will be undertaken for ponds on site in consideration of storm events;
- describe possible mitigation measures to address adverse environmental, health, social and economic effects resulting from effects of the environment on the Project;
- describe measures to enhance positive environmental, health, social and economic effects, resulting from effects of the environment on the Project.
- describe the Project's climate resilience and how the impacts of climate change have been integrated into the project design and planning throughout the life of the Project, including water management planning; and describe the climate data, projections and related information used to assess risks over the life of the Project;
- identify the Project's sensitivities and vulnerabilities to changes in climate (both in mean conditions and extremes such as short-duration heavy precipitation events);
- describe all known and relevant trends in meteorological events, weather patterns or physical changes in the environment that are expected to result from climate change, and incorporate this information into a risk assessment as contributing or complicating factors for accidents



and malfunctions (e.g. increased risk of forest fires). Provide mitigation measures (both passive and active) that the proponent is prepared to take to minimize the frequency, severity and consequences of these projected effects;

- identify any areas of potential wind or water erosion; and
- assess the potential effects of seismic events on facilities and specify the soil movement parameters that will be used with the probability of occurrence (e.g. 2% in 50 years) and the best practice codes and guides that are or will be used in the seismic effects analysis (e.g. National Building Code of Canada 2015, CAN/CSA-Z662 standard).

Additional guidance related to conducting climate change resilience assessments is included in the [Strategic Assessment of Climate Change](#).

13. Canada's Ability to Meet its Environmental Obligations and its Climate Change Commitments

The Government of Canada, through the Act, recognizes that the impact assessment 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 Act, the Impact Statement should describe the effects of the Project in the context of environmental obligations, with a focus on Government of Canada obligations and commitments relevant to decision-making.

Federal environmental obligations relevant to this Project include:

- The Convention on Biological Diversity and Canada's supporting national framework (e.g., the Canadian Biodiversity Strategy, Canada's Biodiversity Outcomes Framework and the current biodiversity goals and objectives in Canada), and legislation that supports the implementation of Canada's biodiversity commitments, including SARA and the Canada Wildlife Act (1985), as well as supporting policies and guidance documents;
- Recovery strategies and action plans developed under SARA for all species at risk potentially affected by the Project;
- The Convention for the Protection of Migratory Birds in the United States and Canada, as implemented in part under the Migratory Birds Convention Act (1994), and supporting guidance documents on conservation objectives and strategies specific to bird conservation regions.

The Impact Statement must:

- describe where the Project may enable Canada to meet its environmental obligations, the proponent's plans and commitments to ensure that positive contributions are respected; and
- describe where the Project may adversely affect Canada's ability to meet its environmental obligations, the mitigation measures and follow-up programs related to those effects.

With respect to climate change commitments, section 8.11 [Climate change](#) of these Guidelines outline the information required as part of the Impact Statement. The Agency, with the support of federal authorities will provide a supplementary analysis on the Project's GHG emissions in the context of Canada's emissions targets and forecasts (see section 6 of the SACC). Although it is not required, the proponent may provide its views in the Impact Statement on the extent to which the effects of the Project would hinder or contribute to the Government of Canada's ability to meet its commitments in respect of climate change in order to inform the impact assessment.



The proponent should refer to the Agency's guidance documents on this topic, including the document [*Policy Context: Considering Environmental Obligations and Commitments in Respect of Climate Change under the Impact Assessment Act.*](#)

14. Extent to Which the Project Contributes to Sustainability

Under the Act, one of the factors that must be considered in impact assessments is the extent to which a project contributes to sustainability. Sustainability is 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. Sustainability is a lens to be applied throughout the impact assessment, beginning in Planning phase. Information and data requirements to inform the sustainability analysis should be considered from the outset of the impact assessment.

The sustainability analysis will consider the potential effects of a project through the application of the following principles:

- consider the interconnectedness and interdependence of human-ecological systems;
- consider the well-being of present and future generations;
- consider positive effects and reduce adverse effects of the Project; and
- apply the precautionary principle and consider uncertainty and risk of irreversible harm.

The application of the principles will result in better information on the effects of the Project, including long-term effects on future generations and the interaction of effects, and may help to identify additional mitigation measures and enhancements. The proponent should refer to the Agency's guidance on this topic: [Guidance: Considering the Extent to which a Project Contributes to Sustainability](#) and [Framework: Implementation of the Sustainability Guidance](#).

The Impact Statement must provide an analysis of the extent to which the Project contributes to sustainability. The analysis should be qualitative but may draw on quantitative data to provide context, and should follow the methodology outlined in the [Framework: Implementation of the Sustainability Guidance](#) document and must:

- describe engagement with potentially affected Indigenous communities and outline measures and commitments that contribute to the sustainability of Indigenous livelihood, traditional use, culture and well-being:
 - include any description of sustainability as defined by Indigenous communities;
- describe the project-specific context, including key issues of importance to Indigenous communities and the public that will inform the sustainability assessment;
- describe how the sustainability principles were considered in:
 - the assessment of the potential effects of the Project, including setting spatial and temporal boundaries, and identifying mitigation measures and enhancements;



- the planning and design of the Project and the selection of the preferred alternative means and alternatives to the Project;
- describe and document all uncertainties and assumptions underpinning the analysis;
- describe how the precautionary principle was applied in cases where there may be risk of irreversible harm;
- provide a summary of the positive and adverse environmental, social and economic effects of the Project, along with any implications for health effects, with emphasis on potentially affected Indigenous communities, local communities and disadvantaged populations; and
- indicate how monitoring, management and reporting systems consider the sustainability principles and attempt to ensure continuous progress towards sustainability.

15. Follow-Up Programs

Follow-up programs are put in place by the proponent to verify the accuracy of the impact assessment and evaluate the effectiveness of mitigation measures. Through the conditions in the decision statement, the proponent is required to develop a follow-up program in consultation with relevant authorities and Indigenous communities and to submit to the Agency the results of monitoring efforts. Monitoring is a key component of follow-up programs and can identify the potential for environmental, health, social or economic degradation during all phases of project development. Monitoring can also assist in developing clearly defined action plans and emergency response procedures to account for environmental, health, social and economic protection.

The proponent should develop expected outcomes for their follow-up programs, in consultation with relevant authorities and Indigenous communities. An expected outcome is defined as an objective that the proponent can reasonably anticipate achieving through a project as a result of the implementation of effective mitigation measures. Expected outcomes may be qualitative or quantitative in nature but must be measurable in order to support a determination of whether mitigation measures are working effectively to eliminate, reduce, control, or offset adverse effects on VCs. Proponents will be expected to provide information on the extent to which they are achieving their expected outcomes in their annual follow-up program reports.

If the follow-up program indicates that mitigation measures are not working effectively, additional measures may be required and implemented. If, through a follow-up program, it is identified that the predictions of the impact assessment were not accurate, corrective action or additional measures may be required to be put in place by the proponent.

Follow-up programs are an opportunity to continue engaging with impacted Indigenous communities. If undertaken collaboratively, they can support solution-oriented approaches to managing adaptively through the early identification of issues in follow-up programs and appropriate solutions incorporating Indigenous knowledge.

- In developing the follow-up program framework for environmental, health, social or economic valued components, as applicable, the Impact Statement should take into account the considerations outlined in the Agency guidance on [Follow-up Programs under the Canadian Environmental Assessment Act](#).

15.1. Follow-up program framework

The duration of the follow-up program must be as long as required to verify the accuracy of the environmental, cultural, social and economic effects, with implications for health effects, and the impacts on the rights of Indigenous peoples predicted during the impact assessment and/or to evaluate the effectiveness of the mitigation measures.

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

- identification of VCs that warrant a follow-up program and rationale taking into account the guidance on follow-up programs cited above;
- the expected outcome(s) and targets of the follow-up program and information describing how the proponent expects to achieve the expected outcome(s);
- preliminary description 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 the effects to the environment or impacts on rights of Indigenous peoples and cultures attributed to the Project are not as predicted;
- mechanism to disseminate follow-up results among the concerned interested parties;
- consideration of accessibility and sharing of data for the general population; and
- opportunities for the involvement of Indigenous communities, stakeholders, local and regional Indigenous organizations in the follow-up program design and implementation and the development of a communication mechanism between these organizations and the proponent.

15.2. Follow-up program monitoring

For the proposed follow-up framework, the Impact Statement must present the preliminary environmental, health, social and economic monitoring program, including, but not limited to the:

- identification of regulatory instruments that include a monitoring requirement for the VCs;
- 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, data management, human and financial resources required);
- a description of the indicators to be used to assess progress towards established objectives and a rationale for their selection
- an explanation of how any differences in predicted effects vs actual measured effects will be attributed to either uncertainty related to predictions or to effectiveness of the mitigation measures
- identification of the monitoring activities that could pose a risk to the environmental, health, social and economic conditions, and/or VCs and the measures and means planned to protect these conditions;

- guidelines for preparing monitoring reports (number, content, timing, frequency, format, duration, geographic extent) that will be sent to the authorities involved; and
- plans, including funding options, to involve Indigenous communities and local communities in monitoring, where appropriate.

15.3. Compliance monitoring

Proponents are responsible for verifying whether the required mitigation measures were implemented. The Impact Statement must present a framework by which it will undertake compliance monitoring for follow-up programs. This should include, but not be limited to:

- identification of those positions accountable and responsible for monitoring and ensuring compliance;
- 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;
- a description of how the monitoring results will be used to trigger the proponent's intervention mechanisms for effects that do not have compliance-based thresholds (e.g., CAAQs for common air pollutants); and
- quality assurance and quality control measures to be applied to monitoring programs.

15.4. Adaptive Management Framework

Proponents should consider adaptive management as a means to address high uncertainties associated with the effectiveness of mitigation measures or predicted effects and to help ensure expected outcomes are achieved. Adaptive Management Plans establish a systematic process following six iterative steps: assess, design, implement, monitor, evaluate, and adjust. An Adaptive Management Plan may be warranted in addition to a follow-up program if it meets each of the following criteria:

1. There is high uncertainty around the effectiveness of mitigation measures or predicted effects.
2. There is a need for, or benefit to reducing uncertainties through an Adaptive Management Plan.
3. Adaptive management is technically feasible.

Adaptive management does not eliminate the need to provide sufficient information on the baseline conditions or effects attributed to the designated project. Nor does it eliminate the need



to characterize effects and identify appropriate mitigation measures to eliminate, reduce or control those effects.

For more information on adaptive management, please refer to the Agency's guidance on [Adaptive Management Measures under the Canadian Environmental Assessment Act 1992](#) (guidance to be updated).

16. 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. The 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.

The Impact Statement must also include a series of tables summarizing the following information :

- potential environmental, health, social and economic effects and the potential impacts on Indigenous peoples;
- potential mitigation and enhancement measures in relation to potential effects and impacts;
- description of the residual effects of the Project;
- cumulative effects and proposed mitigation measures to address them;
- any other commitments made by the proponent or recommendations made by the proponent to other parties; and
- identifies the effects falling within federal jurisdiction, as well as, direct or incidental effects and describes the extent to which the effects are significant (based on the characterization of residual effects). The effects within federal jurisdiction, and direct and incidental effects, are defined in section 2 of the Act.

17. Appendix 1 – Additional Guidance

This appendix contains guidance on how to address the requirements outlined in the main body of the Guidelines. Guidance has been placed in appendix for ease of reading. The proponent is expected to demonstrate how relevant guidance or technical recommendations were used. Alternatively, a rationale must be provided as to why it is not applicable, feasible, or why different approaches were found more adequate

List of Project Components & Activities

The list of project components and activities, as required in section [3.4 Project components and activities](#), should focus on those with the greatest potential to have environmental, health, social and economic effects, or impacts on Indigenous peoples and their rights, as determined by Indigenous communities. Sufficient information must be included to adequately predict adverse and positive effects, the interaction between those effects and any disproportionate effects for diverse subgroups within communities.

Project components and activities should include the following elements, as relevant:

Project Components

- water management infrastructure to divert, control, collect and discharge surface drainage and groundwater discharges to the receiving environment, including collector ditches, groundwater interception wells, sedimentation ponds, sumps, and pump and pipeline systems;
- treatment facilities for potable water, sewage, wastewater and effluent (including proposed treatment technologies, footprint, location, discharge locations);
- material stockpiles including hazardous waste, fuel storage tanks, and explosives warehouses;
- waterbody diversions or realignments;
- crossings of waterbodies and watercourses, including bridges and culverts;
- construction workspace and laydown areas;
- temporary or permanent infrastructure, including administration buildings, warehouse, garages, maintenance offices);
- sources of drinking and industrial water;
- energy supply source;

- waste disposal (types of waste, methods of disposal, quantity, disposal sites or facilities);
- site access roads or routes;
- borrow pits and quarries;
- fences and barriers;
- any other infrastructure relevant to the Project;
- mine waste management facility (footprint, location and preliminary design) and related pipelines (including those for tailings and return water);
- storage of waste rock, overburden, topsoil, low grade ore storage, lake sediment, and stockpiles (footprint, locations, volumes, development and management plans and design criteria);
- open pit and underground mine (footprint, location, development plans including pit phases);
- crusher and processing facilities (footprint, process, technology, location);
- storage and load out facilities for concentrate and or finished product;
- fueling stations for trucks / vehicles or energy supply source (e.g. generators);
- explosives manufacturing and storage (method, location, licensing, management);
- aggregate deposits and aggregate plant (footprint, location, volumes) , if needed;
- permanent and temporary linear infrastructures (access roads, rail line, conveyor, haul roads, transmission line, and pipelines), identifying the route of each of these linear infrastructures, the location and types of structure used for stream crossings;
- provide the conceptual design features of all collector and diversion ditches, culverts, bridges, spillways and water storage facilities (including sediment ponds and seepage collection ponds); and
- construction of dams.

Project Activities

Site preparation and construction

- construction staging;
- surveying and staking;
- site grubbing, clearing and excavation, including tree and vegetation removal;
- excavation and salvage of topsoil, soil and bedrock, and rocky substrates including potentially acid-generating and metal-leaching materials;
- management of excavated materials, including potentially acidogenic or leachable materials;
- blasting (frequency, duration, time of year, time of day and methods);
- explosives manufacture, transportation, storage and management;

- construction of access roads;
- clearing of transmission corridor and construction of powerline to site;
- construction of site fencing;
- changes to existing infrastructure (e.g. relocation of pipelines);
- transportation and management of borrow materials requirement (source and quantity);
- storage areas for material stockpiles;
- water management, including water diversions, dewatering or deposition activities, storm water management, site drainage, runoff management and sediment or erosion control;
- water management to divert, control, collect and discharge surface drainage and groundwater seepage to the receiving environment, including collector ditches, groundwater interception wells, sedimentation ponds, sumps, and pump and pipeline systems;
- construction of water management facilities to manage water that comes into contact with plant processes, including collector ditches, sumps, pump and pipeline systems, and groundwater interception wells;
- water requirements for project construction, operation, decommissioning and closure, including estimate of quantities needed;
- management and treatment of wastewater and discharge points;
- construction of mine waste management facility;
- water for pressure testing;
- operation of light duty, heavy-duty and mobile off-road equipment (type, quantity);
- construction of temporary or permanent infrastructure;
- transportation of employees;
- storage, gestation, disposal and management of hazardous materials, fuels and waste (indicate types, methods and amounts);

Operation

- product production and stockpiling, product extraction, processing and treatment;
- drilling and blasting, explosives manufacture, storage and use;
- management and disposal of wastes onshore and offshore;
- storage, handling and transport of materials;
- use and maintenance of access roads;
- water management, including water diversions, site drainage and runoff management, sediment and erosion controls, site dewatering, potable water, water use requirements, storm water, process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release point(s) and receiving waterbodies); storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials;

- mine waste management, including tailings, waste rock, ore, overburden and topsoil;
- waste management and recycling (other than mine waste such as tailings and waste rock);
- workforce management, including transportation and work schedules.

Suspension, abandonment or decommissioning

- 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;
- site restoration;
- removal of surface contamination from facilities and equipment;
 - well decommissioning;
- dismantling and removal of equipment and systems,;
- demolition or disposition of buildings and ancillary structures;
- decommissioning
- long term care, monitoring and maintaining the integrity of the site, including site drainage and water management, and any remaining structures;
- transfer of fuel and associated wastes to interim and long-term licenced storage facilities (including nuclear facilities); and
- suspension, abandonment or decommissioning for temporary or permanent facilities.

Sources of Baseline Information

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

- field studies, including site-specific survey methods;
- database searches, including federal, provincial, municipal and local data banks, including for example:
 - [Ontario Natural Heritage Information Centre](#)
 - [eBird Canada](#);
 - [Breeding Bird Survey](#) (BBS);
 - [Christmas bird count](#);
 - [Birds Canada's Canadian Migration Monitoring Network](#)
 - [Nature Counts](#);
 - [iNaturalist](#);

- [Neighbourhood Bat Watch](#)::;
- [Bird Conservation Regions and strategies](#);
- land cover data, such as forest cover maps, or remote sensing data for important habitats features and important characteristics;
- research programs of regional industry, resource or species-specific committees;
- protected areas, watershed or coastal management plans;
- natural resource management plans;
- species recovery and restoration plans;
- [Species at Risk Public Registry](#) for information on federally-listed species at risk and available recovery documents;
- [Species at Risk in Ontario](#) for information on the provincial list of species at risk and available recovery documents
- [Ontario Species at Risk Guides and Resources](#) (includes many best management practices);
- field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape);
- published literature;
- environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area;
- regional studies or assessments, 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;
- human health impact assessments or risk assessments;
- information available from Canadian Institute for Health Information under [Community and Health System Characteristics](#);
- community and regional economic profiles; and
- statistical surveys, as applicable.

The proponent should consult with federal, provincial or local government authorities to determine whether additional data sources and survey methods may be appropriate.

Establishing Spatial and Temporal Boundaries

The following guidance is supplement to the requirements in section 7.3 *Spatial and temporal boundaries*.

The study area boundaries must encompass the spatial boundaries of the Project, including any associated project components or activities, and the anticipated boundaries of the project effects. The proponent should consider the following areas in assigning appropriate spatial boundaries:

- 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;
- air zone(s) and airsheds under the Air Quality Management System;
- local major emission sources;
- areas of importance to people, including recreational areas;
- International and provincial borders (i.e. Ontario-Quebec borders) which require transboundary assessment;
- modelling domain size based on isopleths resulting from the Project-only case that represents 10% of the appropriate jurisdictional ambient air quality criteria (within the limits of validity of the model);
- areas within the range of vision, light and sound;
- the locations and characteristics of the most sensitive receptors or areas;
- 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 communities;
- areas of known Indigenous land²⁰, cultural, spiritual and resource use; and
- existing affected infrastructure.

For biophysical VC, spatial boundaries should be defined using an ecosystem-centered approach. See document [Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 \(2014\)](#) for more information on establishing spatial boundaries).

For habitat-related VCs potentially affected by the Project, a land cover analysis, including freshwater and marine environments, should be conducted to determine appropriate ecological boundaries and buffer distances around the project area. The spatial extent of habitat and habitat functions should influence the determination of an appropriate local study area and regional

²⁰ Indigenous lands may encompass reserve lands, traditional territories and/or treaty lands

study area. Spatial boundaries of the RSA should be changed if one or more land cover types are concentrated in a sub-area and are uncommon in other parts of the region.

Where a VC is a species, the local study area should correspond to the project study area plus a buffer defined in consideration of direct and indirect project effects to species including habitat effects, changes to connectivity, alteration of predator/prey dynamics, mortality, sensory disturbance, and pollution. Use simulation modelling to help define buffers that address the species or species group being assessed. The proponent should contact federal, provincial and/or local government authorities to verify appropriate boundaries for wildlife species.

Spatial boundaries should consider the location of sensitive receptors, which may include:

- vulnerable individuals or subgroups, (e.g. individuals with compromised health, children, pregnant women, seniors);
- residences, health and social services institutions (e.g. hospitals, long-term care facilities, seniors' residences);
- educational institutions (e.g. schools, daycare centres, early childhood centres);
- tourism establishments (e.g. tourism information offices, museums, ski areas, summer camps, outdoor recreation areas, camp sites);
- recreational areas (e.g. recreational land, urban parks, parks and conservation areas);
- areas for the exercise of the rights of Indigenous peoples; and
- sensitive wildlife species or habitats (e.g. soil types or areas with historical loading or poor buffering, important areas of wildlife use, harvesting activities).

The temporal boundaries of the impact assessment should span all phases of the Project. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries. Define temporal boundaries in a manner that enables detection of all species that use the Project Area, Local Study Area, and Regional Study Area throughout the year and from one year to another, and to estimate their temporal pattern of use (e.g. breeding, migrants stopping on northward and/or southward migration). Temporal boundaries spanning more than one year will enable accounting for variation due to irregular events (e.g. masting events, storms on migration, late snowfalls).

Developing Mitigation Measures and Enhancements

Mitigation measures are technically and economically feasible measures to eliminate, reduce, control or offset the adverse effects of a designated project, and include restitution for any damage caused by those effects through replacement, restoration or compensation. The "hierarchy of mitigation measures" presents three options for types of mitigation measures, in descending order of preference:

- **Eliminate:** refers to the elimination of effects, such as by changing the location or design of the Project. It can also be referred to as "avoidance" of effects.
- **Reduce and control:** aims to reduce effects to the extent possible, for example, by modifying the most adversely impactful project activities or components or by taking measures specific to the potential effects. There may still be residual effects where measures are not sufficient to eliminate the effects, or where their absolute effectiveness is uncertain. Effects may also be "minimized" when it is not possible to "avoid" them.
- **Offset:** aimed at offsetting residual effects following consideration of elimination and reduction measures, through measures referred to as "compensation" or "restitution". For example, where an effect on fish habitat persists, it may be possible to offset through the creation of new habitat (replacement) or to propose measures to restore degraded habitat conditions. These include measures referred to as replacement, restoration or (financial) compensation.

As a first step, the proponent should use an approach based on the avoidance and reduction of the adverse effects at the source, namely consider modifying the design or changing the location of certain project components.

Enhancement measures for positive effects are not necessarily required to mitigate negative effects, but are measures that may be developed to make use of opportunities presented by the Project to contribute to, for example, local and regional training efforts, investment in infrastructure and services, projects to rehabilitate degraded environments, etc. Measures are to be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation.

The proponent is 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.

Compensation and Offset Plans

Where compensatory or offset measures are proposed to mitigate effects (e.g. on species at risk and their critical habitats, fish and fish habitat, or wetland functions), the Impact Statement must include the compensation or offset plans for consideration during the impact assessment process.

In general, these plans should address the following elements, or refer to locations in the Impact Statement where this information is presented:

- describe the baseline conditions of the species at risk, critical habitat, fish and fish habitat and wetland functions potentially impacted by the Project;
- explain and justify the hierarchy of mitigation measures considered;
- identify and describe residual effects that are the subject of the compensatory measures;

- identify a compensation ratio with rationale, including how any policies or guidance provided by federal and provincial authorities and Indigenous peoples have been considered;
- where feasible, identify the location and timing of implementation of compensation projects;
- identify and describe the success criteria;
- identify and describe in detail non-habitat related compensation measures (e.g. predator control);
- describe how the proposed measures align with published provincial and federal recovery management or action plans and strategies for species at risk, or for fish and fish habitat;
- describe how the proposed measures align with published provincial and federal recovery management or action plans and strategies for wetlands;
- identify, if possible, the parties responsible for implementation of the compensatory measures, including monitoring and review;
- identify indicator species for setting compensation objectives. The choice of indicator species should be based on baseline data. Species at risk should not be used as indicator species, since compensation efforts must be specifically directed to these species;
- describe the habitat functions gained at the compensation site(s);
- provide evidence that habitat functions can be replaced by the proposed offset activities;
- describe the selection process for proposed compensation sites and associated baseline conditions;
- provide a description of the monitoring schedule and activities to be completed to verify the success of compensation activities; and
- if offsets are required to address residual effects, refer to the [Operational Framework for Use of Conservation Allowances](#).

The proponent must explain how Indigenous peoples were involved in the development of the compensation plans. The proponent must demonstrate how the information received from Indigenous peoples has been taken into account, including the choice of compensation ratios, if applicable. The proponent must also elaborate on how Indigenous peoples will be involved in the implementation of the compensation measures and the evaluation of the success of these measures.

For compensation plans targeting **species at risk**, the proponent can refer to Template 2 in the [Species at Risk Act Permitting Policy](#).

With respect to **wetlands**, compensation plans should:

- clearly indicate the location and total area of each type of wetland, as well as their respective locations, for which the residual effects should be mitigated by compensation measures;
- favour the restoration of drained or altered natural wetlands of the same type and function as those affected by the Project. Wetland restoration is preferable to wetland enhancement, both of which are preferable to the creation of new wetlands;

- demonstrate that wetland functions can be replaced by the proposed compensation activities;
- indicate where it is not possible to compensate for the loss of functions in cases where wetlands are unique, perform habitat functions that ensure the survival of a large proportion of migratory birds, or provide habitat for species at risk; and take this information into consideration when developing compensation measures;
- use a minimum ratio of 2:1 for the area of wetlands to be restored or created, versus the original area of wetlands affected. A higher compensation ratio is recommended for wetland types where compensation is more difficult or where there is uncertainty about the success of the compensation measures. The choice of ratio for wetland compensation needs to be justified;
- compensate lost wetland functions on-site if site conditions are suitable for wetland functions. If this is not possible, the preference is to compensate within the same watershed, and then within the same ecosystem as the one where functions are affected;
- minimize the delay between the time the adverse effects occur and the time habitat and functions are restored; and
- explain how vegetation removals, as well as soil and peat excavation activities will be managed for reclamation of disturbed wetlands (e.g. methods, conditions and timing of stockpiling).

For **fish and fish habitat**, each offsetting plans should include:

- an exact location for the proposed measures of the Project (latitude and longitude, lot number, municipality, regional municipality county, etc.) and property rights;
- baseline information including a description of the environment (biological, hydrological, physical, chemical, etc.), an estimation of the quality of the environment in question and a description of the issue to address. Ideally, the description of the environment should be accompanied by georeferenced and dated photographs;
- a description of the proposed measures (nature, extent, method, timetable, etc.);
- the fish species affected by the proposed measures, including the resulting fish habitat functions (feeding, reproduction, rearing, shelter, growth, migration);
- an assessment of the benefits to fish and fish habitat resulting from the offsetting measures in terms of the significance, magnitude and adequacy of the gains to be achieved with respect to the current situation; and
- a follow-up program to measure the success of offsetting objectives, including the details of its implementation. Offsetting objectives as well as the methods and criteria used to evaluate success (parameters, frequency, duration, etc.) must be clearly identified and described. Deliverables must be identified (e.g. baseline information, follow-up protocol, plans and specifications, work report, follow-up report, etc.), along with contingency measures in case success criteria are not met. The offsetting objectives and the timelines of the follow-up program (including deliverables) should be compiled in one or more tables.

Offsetting plans and monitoring programs for fish and fish habitat should be developed using standard Fisheries and Oceans Canada (DFO) guidance:

- [A review of functional monitoring methods to assess mitigation, restoration, and offsetting activities in Canada](#);
- [Assessing the Effectiveness of Habitat Offset Activities in Canada: Monitoring Design and Metrics](#);
- [Equivalency metrics for the determination of offset requirements for the Fisheries Protection Program](#); and
- [Policy for applying measures to offset adverse effects on fish and fish habitat under the Fisheries Act](#).

Guidance for Biophysical Components

Atmospheric, Acoustic and Visual Environment

The following guidance should be consulted in conjunction with section [8.4. Atmospheric, acoustic and visual environment](#):

- project sources of air pollutant emissions should include the following types of sources:
 - point sources: including but not limited to power generation equipment (i.e. gensets), turbines, compressor engines, incinerators, exhaust vents and stacks from processing facilities, ventilation vents, boilers and other heating equipment, flares, docked marine vessels, idling train engines and other transport vehicles, fugitive emissions from storage tanks and leaks for gas pipes and other equipment. This should also include start-up and shut-down emissions, as appropriate;
 - area sources: including drilling and blasting activities, material handling and transport, wind erosion of material piles, fugitive emissions from exposed mine faces, fugitive emissions from process areas and tailings management areas;
 - mobile / road sources: including tailpipe emissions and fugitive dust emissions. Fugitive dust emission factors and assumed mitigation (control efficiency) should be described and should be justifiable based on what is practicable. Tailpipe emission factors should be estimated using established methods. Include all off-road and on-road fleet vehicles used in the Project;
 - emissions from project-related vessels and their tugs in transport along the entire marine shipping area, and rail transport;
- baseline data should be taken from existing or new long term monitoring with representative monitoring data, collected over an appropriate duration (multi-year) and geographic scope;

- if a long-term monitoring data is not available, then other techniques may be acceptable on a case-by-case basis – with a rationale provided – including:
 - limited or short term monitoring;
 - data from a surrogate site that has similar meteorological and air quality to represent the site in question;
 - results of existing large scale modelling;
 - dispersion modelling to indicate spatial distribution of contaminants;
- for requirements pertaining to the use of atmospheric dispersion modelling, the proponent should:
 - conduct modelling for an appropriate time period to account for variability in meteorology and baseline conditions, and use the most recent meteorological and emissions data available;
 - conduct dispersion modelling for all relevant temporal scenarios including; pre-development scenario, the base case (accounting for all existing emission sources plus projects approved and under construction, but excluding the Project), project alone scenario (representing emissions from the Project only), application case (base case plus the Project), and future development case (application case plus projects that are currently proposed but not yet approved);
 - use appropriate domain boundaries and identify transboundary considerations. At a minimum, the modelling domain should enclose concentrations that are 10% of relevant air quality criteria; and
 - use an air quality model that is appropriate for the complexity of the terrain, sources and meteorology.

The proponent should engage with experts at ECCC to inform the choice of program to conduct regional air quality modeling of acidifying deposition rates.

Wetlands

The following guidance should be consulted in conjunction with section [8.6 Vegetation, riparian and wetland environments](#).

With regards to the wetlands functions assessment, the proponent should:

- complete a Level 1 assessment across the RSA using the [Ontario Land Cover Compliance v2.0](#), and a Level 2 assessment for wetlands that the Project would directly impact and of wetland(s) that are hydrologically connected. A Level 3 assessment is not required. In conducting this assessment, the proponent should ensure that wetlands are considered in the context of:
 - the larger watersheds of which they are a part;
 - adjacent land use with a focus on hydrological and other functions;

- landscape and/or watershed considering topography, soil types and hydrological linkages;
- be as specific as possible to the biological characteristics of the wetland and to the ecological services and functions it provides. The assessment must consider hydrological, biogeochemical, habitat, and climate functions. Climate functions may best be nested within the hydrological and biogeochemical functions or considered separately, depending on the methodology selected;
- collect data from representative wetlands in a manner that enables reliable extrapolations in space (i.e. at minimum to the project area, LSA and RSA) and in time (i.e. across years), including:
 - design surveys in support of the assessment so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of mitigation effectiveness. Survey designs should be sensitive enough to detect and quantify the effects at the appropriate spatial and temporal scales, any departures from predictions, and the effectiveness of mitigations. Justify the selection of modeling techniques based on current and recent scientific literature;
 - Survey protocol planning should include the development of statistical models, modeling and use of simulations to estimate sampling requirements, and analyses to evaluate resulting design options. Sample size must be planned to support evaluation of the project study area within the context of the LSA and RSA. Appropriate design of surveys will need to consider multiple survey locations in order to represent the wetland heterogeneity of the RSA, and to yield multiple survey locations per wetland type, without requiring aggregation of habitat classes post-hoc;
- incorporate the value of wetlands from an Indigenous perspective and existing disturbance when making proposals for wetland offsets;
- provide this assessment in a quantitative form and include the collection of site-specific baseline information on wetland functions, including:
 - surveys to assess for the presence, abundance, density, and distribution of migratory birds and federally listed species at risk, provincially listed species at risk, and species assessed by COSEWIC as at-risk in relation to potentially affected wetlands and associated riparian areas. Surveys should meet appropriate standards, be species or bird group specific as appropriate, and be conducted during the appropriate times of the year;
 - surveys for species at risk should assess species individually where possible (typically an indicator approach is not appropriate for species at risk). Surveys should not be limited to species or groups of species that are wetland-obligate, but rather should include any species known to use wetland habitats as part of its lifecycle. Data should be sufficiently robust to identify which wetland classes are important to which species (and for how many);

- a supporting rationale and detailed description of the methods used in completing the wetland functions assessment, including sampling design;
- It is recommended that the proponent be prepared to:
- Submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form; and
- Provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation).

Fish and Fish Habitat

- The following guidance should be consulted in conjunction with section [8.7 Fish and fish habitat](#), as relevant to the establishment of baseline conditions.
- for watercourses, it is recommended that the description be provided on the basis of homogenous section. Parameters to be measured may include: length of the section, wetted width at the ordinary high water mark (OHWM), depth, streamflow types and characteristics (depth, velocity, turbidity, peak and low flows), substrate type (shoreline and bottom), aquatic (e.g. grass flat) and riparian vegetation, natural (significant vertical drop, waterfalls, subsurface flow over large distances, etc.), and anthropogenic barriers (stream crossing structures, etc.) that impede or obstruct free passage of fish. The obstacles must be documented (size, condition, etc.) and their passability by fish must be assessed.
 - Ordinary High Water Mark is the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (e.g., rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water-body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (i.e. full supply level).
- for waterbodies, the parameters to be measured include, but are not limited to, size, bathymetry, littoral, sublittoral, bathyal, epipelagic, mesopelagic, bathypelagic zones, maximum and average depths, seasonal water level fluctuations, substrate type (sediment), aquatic (submerged, floating and emergent) and riparian vegetation, and water quality (temperature and dissolved oxygen profile, turbidity, transparency, pH, salinity);
- baseline measurements of contaminants should be provided for the complete fish food web (including water, invertebrates, prey fish), and include carbon and nitrogen stable isotope measurements in fish and the complete fish food web. These measurements should then be

used to inform the assessment of effects from contaminants, including bioaccumulation of contaminants, in fish downstream of the Project

- For potentially affected fish, the proponent should:
 - First, use existing information (e.g. accessible regional reports, primary literature, fisheries management objectives, information from consultation and engagement activities, traditional knowledge of Indigenous peoples affected by the Project, etc.). Existing information should be supplemented using field data collection as necessary to support the assessment, and as relevant to validate predictions and mitigation success in the future;
 - Perform field data collection programs in a representative number of locations (including reference locations where applicable), using sampling methods appropriate to the aquatic system, and should be performed in multiple seasons;

With respect to the assessment of effects on fish and fish habitat, the proponent should:

- present potential habitat alteration, disruption and destruction on maps at appropriate scales, as well as in the form of tables;
- include changes to surface water conditions resulting from changes to groundwater quantity and discharge location. [The Framework for Assessing Ecological Flow Requirements to Support Fisheries in Canada](#) should be used to guide this aspect of the effects assessment;
- refer to standard metrics for changes in habitat quality and quantity to choose an analysis that is appropriate to the type and scale of effects (see [A framework for assessing fisheries productivity for the Fisheries Protection Program](#)). For example, broader, ecosystem-wide effects may require a modelling approach. It is recommended that the information be collected in the form of a map at appropriate scales, as well as in the form of a table; and
- consider that the effects of chronic and acute disturbances to fish populations are often dependent on the state of the fish population. If the fish population is already quite depleted, the effect of an acute disturbance may have a disproportionate effect on the population.

Birds and Bird Habitat

The following guidance should be consulted in conjunction with section [8.8. Birds, migratory birds and their habitat](#):

- Data collection should come from surveys that are designed to meet the defined outcomes and goals for the Impact Statement. Designed data collection (as opposed to haphazard, opportunity or convenience based sampling) ensures that goals are met, and the potential for biases in the data collected are minimized. 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;
- it is recommended to collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two

years of sampling is suggested as a minimum. As the number of sampling years increases, so does the understanding of natural variability. Repeated sampling of locations or spatial overlap of sampling between years is required to separate spatial variability from temporal variability;

- if recent existing data is available for the study area, it can be used to complement the data collected in the field. If data from prior surveys is used to replace further sampling (e.g. only one year of sampling is planned to be conducted), a demonstration must be presented that these data and survey designs meet the requirements outlined below;
- in order to establish adequate baseline conditions for birds, the proponent should take into account the following technical recommendations:
 - collect data to account for natural variability among years, within and among seasons, and within the 24-hour daily cycle;
 - collect data in a manner to allow for reliable extrapolations in space (i.e. at a minimum in the project area, local and regional study areas) and in time (i.e. over the years);
 - design surveys so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of the effectiveness of mitigation measures. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e. project area, LSA, RSA), any departures from predictions, and the effectiveness of mitigation measures. Justify the selection of modeling techniques based on current and recent scientific literature;
 - survey protocol planning should include development of statistical models, use of simulations to estimate sampling requirements and analyses to evaluate sampling design options;
 - use spatially balanced and randomly chosen sampling sites, preferably using stratified random sampling that covers all habitat types. When major habitat edges are identified, sampling should be designed such that it is possible to sufficiently describe the importance not only of the types of habitat, but also of the edges between the types of habitat;
 - provide the criteria and document any simulations used to select sample sites and sample sizes;
 - plan the sample size to ensure the assessment of the project area in the context of the local and regional study areas will consider a large enough number of sites to represent the heterogeneity of regional study area habitat and to plan the number of sites by land cover or by habitat class so that aggregation of post hoc habitat classes is not necessary;
 - design sampling effort per unit area – field survey effort to be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area, but should be scaled to the likelihood that project effects will affect birds within that zone. Efforts outside the project study area

- should be designed to ensure that estimates comparing within and across the project study area, local study area and regional study area are unbiased and are as precise as possible.
- have sufficient sampling effort and sampling locations to reflect variability among habitat type in the project, local and regional study areas, with more intensive sampling effort:
 - in the project area;
 - in areas or habitats more likely to be affected by the Project;
 - for rare species that may be harder to detect;
 - if necessary to constrain or adjust site selection based on access limitations, simulation modelling should provide evidence that this sampling strategy has not resulted in the introduction of bias. Minimize, quantify, and understand bias(es) in estimates of abundance that impair extrapolation and statistical inference;
 - take into account detection and measurement errors in statistical models where appropriate;
 - provide estimates of confidence or error for all estimates of abundance and distribution. Estimates should be defined (e.g., mean across years, mean across sites, modeled prediction) and, if appropriate, confidence or other intervals should be defined (e.g., 95% confidence intervals, credible intervals).
 - Describe the methodologies used for conducting point counts, ARUs, and aerial transects and provide rationales for why the methodologies are best suited for the Project;
 - metrics for individual species should include the following: distribution in space, frequency of occurrence, occurrence and abundance trends in time, abundance and density, as well as the types of associated habitats and the strength of the associations;
 - analyses and descriptions of baseline conditions for bird species should not be limited to the indicator species. The identification of species, distribution, abundance and, when possible, estimates of species' breeding status should be the main quantification objectives. Collapsing assessments into proxy (equivalent to focal or indicator) species is likely to lead to inaccurate estimates of project impacts when a project is expected to impact many bird species. The use of proxy species is likely to lead to unreliable conclusions since the assumption of equal impacts to all species within groups may be unfounded;
 - when identifying areas of concentration of migratory birds, the following must be considered:
 - migratory bird concentrations can vary within a year and between years. It is therefore important to survey across the project study area, local study area, and regional study area both temporally and spatially;
 - counts of migrating birds are dependent on length of stay as well as total numbers of birds using a site. Attempt to estimate abundances across a migratory period should incorporate an estimate of inter and intra-annual trends and estimates of lengths of stay. Irruptive species may act in ways similar to migrants in terms of abundance. They may be

absent from an area until conditions change (such as a mast event), during which time the habitat becomes vital to these species;

- to quantify trophic linkages in the project area and the local study area, the proponent should consider using Structural Equation Models or other methods that make use of casual inference;
- baseline description of bird habitats should include, at a minimum, characterization of biophysical conditions with regard to ecoregion and Bird Conservation Region (BCR), taking into account the specific conditions found near the borders of these regions;
 - habitat surveys need to be detailed enough within the local and regional study areas to provide context for local and regional habitat availability and quality;
 - mixed wood and old-growth forest land cover and other upland vegetation types are important for many forest associated birds, supporting birds during migration, breeding and through the winter. Wetlands are ecologically important elements of the landscape. Waterway riparian corridors with adjacent mixed wood forest are another relatively uncommon feature that should be clearly identified;
- the analysis of predicted effects on birds should:
 - include separate analyses for each activity, component and project phase;
 - distinguish between birds listed under the *Migratory Birds Convention Act, 1994* and birds that are not under that Act;
 - consider sources of error for all analyses to ensure that the final effects predictions indicate the best estimate of precision;
 - explore, wherever possible, non-linear, indirect and synergistic responses to the Project; and
 - produce defensible forecasts of effects on bird species or groupings and of the effectiveness of mitigation measures.

The proponent should consult:

- *Framework for the Scientific Assessment of Potential Project Impacts on Birds* for examples of project types and recommended techniques for assessing effects on migratory birds;
- Government of Canada's guidance on the website [Avoiding harm to migratory birds](#) to characterize effects on birds in terms of amount, duration, frequency, and timing of disturbances;
- [Guidelines to reduce risk to migratory birds](#) and ECCC's website on [General nesting periods for migratory birds](#) to inform the development and application of mitigation measures;
 - Note that although the nesting period dates on ECCC's website cover the main nesting periods of migratory birds, in order to reduce the risk of taking nests or eggs, it does not authorize the disruption, destruction or taking of a migratory bird, its nest or its eggs outside these periods.

It is recommended that the proponent be prepared to:

- Submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form; and
- Provide documentation and digital files for all results of analyses that allow for clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation).

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.

Wildlife and Species at Risk

The following guidance should be consulted in conjunction with section [8.9. Terrestrial wildlife and wildlife habitat](#) and for section [8.10 Species at Risk and their habitat](#).

In order to establish adequate baseline conditions for wildlife, take into account the following technical recommendations:

- data collection should come from surveys that are designed to meet the defined outcomes and goals for the Impact Statement. Designed data collection (as opposed to haphazard, opportunity or convenience based sampling) ensures that goals are met, assumptions for analysis and statistical modelling are met, and the potential for biases in the data collected are minimized. Wildlife surveys should be designed based on a thorough review of the available scientific literature pertinent to the specific region, wildlife, and anticipated effects
- It is recommended to collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability. Repeated sampling of locations or spatial overlap of sampling between years is required to separate spatial variability from temporal variability;
- if recent existing data is available for the study area, it can be used to complement the data collected in the field. If data from prior surveys is used to replace further sampling (e.g., only one year of sampling is planned to be conducted), a demonstration must be presented that these data and survey designs meet the requirements outlined below.
- survey protocol planning should include the development of statistical models, use of simulations to estimate sampling requirements and analyses to evaluate survey design options. In order to establish adequate baseline conditions, the proponent should take into account the following technical recommendations:

- collect data to represent sources of temporal variation between years, during and between seasons (e.g. spring migration, breeding, fall migration, wintering), and in the daily 24-hour cycle;
- consider that rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys;
- collect data in a manner to allow for reliable extrapolations in space (i.e. at a minimum in the project area, local and regional study areas) and in time (i.e. over the years);
- design surveys so that they represent the spatial and temporal targets of modelling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of the effectiveness of mitigation measures. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e. project area, LSA, RSA), any departures from predictions, and the effectiveness of mitigation measures. Justify the selection of modeling techniques based on current and recent scientific literature;
- use spatially balanced and randomly chosen sampling sites, preferably using stratified random sampling that covers all habitat types. When major habitat edges are identified, sampling should be designed such that it is possible to sufficiently describe the importance not only of the types of habitat, but also of the edges between the types of habitat;
- provide the criteria and document any simulations used to select sample sites and sample sizes;
- plan the sample size to ensure sufficient assessment of the project area in the context of the local and regional study areas. Survey design will need to consider a large enough number of sites to represent the heterogeneity of regional study area a habitat and to plan the number of sites by land cover or by habitat class so that aggregation of post hoc habitat classes is not necessary;
- design sampling effort per unit area - field survey effort to be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area, but should be scaled to the likelihood that project effects will affect wildlife and species at risk within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing within and across the project study area, local study area and regional study area are unbiased and as precise as possible.
- have sufficient sampling effort and sampling locations to reflect variability among habitat type in the project, local and regional study areas, with more intensive sampling effort:
 - in the project area;
 - in areas or habitats more likely to be affected by the Project;
 - for rare species that may be harder to detect;

- if necessary to constrain or adjust site selection based on access limitations, simulation modelling should provide evidence that this sampling strategy has not resulted in the introduction of bias. Minimize, quantify, and understand bias(es) in estimates of abundance that impair extrapolation and statistical inference;
 - provide estimates of confidence or error for all estimates of abundance and distribution. Estimates should be defined (e.g., mean across years, mean across sites, modeled prediction) and, if appropriate, confidence or other intervals should be defined (e.g., 95% confidence intervals, credible intervals).
- preferably use stratified random sampling of habitat. Sample sites must be selected using a random procedure such as a GIS grid overlay;
 - plan to include several sampling stations and several visits to each station to support all required assessment analyses. Inventories and analyses should be conducted by qualified experts; and
 - consult recovery plans for which a survey schedule would have been created to identify information gaps for these species, including for the designation of critical habitat.

Requirement specific to bats:

- Include the following types of surveys:
 - Acoustic surveys, ensure study design is statistically valid;
 - Continuous acoustic monitoring throughout the night (as least sunset to sunrise; 30 minutes before sunset to 30 minutes after sunrise recommended) active season (spring dispersal/ migration, breeding summer/ fall migration and swarming), as well as appropriate hibernaculum surveys;
 - Locate and assess potential hibernacula and roosts for use by bats, accounting for inter-annual and within-season variability in use, including existing mine infrastructure;
- Data or reports must include information on acoustic detection methods used, including the following:
 - Detector make and model;
 - Microphone model used;
 - Location of Detectors;
 - Height of microphones;
 - Orientation of microphones;
 - Special housing that may affect microphone sensitivity (e.g. wind screen, cones, weatherproofing, etc.);
 - Mounting method (e.g. meteorological tower, pole, etc.);
 - Device specific settings (e.g. gain/ sensitivity, TBC, etc.);

- Recording mode (i.e. full spectrum or zero-crossing);
- A summary of any issues with equipment failure, and a description of procedures used to ensure equipment was operational during deployment (including ensuring microphone sensitivity remains within an acceptable range);
- Clearly describe methods used to define a bat “pass” and be consistent with the definition used for any comparison group. Provide a rationale for the chosen method;
- Clearly describe methods used for acoustic identification, including any validation procedures used, criteria used for deciding on species classifications, and software used (including versions and settings); and
- Where results are compared across years, timing of surveys compared, equipment and setup protocols must remain consistent across years.

It is recommended that the proponent be prepared to:

- submit complete data sets from all survey sites. These should be in the form of complete and quality-assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form; and
- provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation).

The proponent should contact provincial or local government authorities to determine additional data sources and survey methods.

A permit under the [*Species at Risk Act*](#) must be previously obtained for surveys on federal lands that are likely to harm, harass, capture or kill species at risk, other than migratory birds.

18. Appendix 2 – Resources and Guidance

Atmospheric, Acoustic and Visual Environment

Air Quality Management System (AQMS) and the Canadian Ambient Air Quality Standards (CAAQS). Canadian Council of Ministers of the Environment (CCME). Available at <https://ccme.ca/en/current-activities/air>

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Environmental Code of Practice for the Measurement and Control of Fugitive VOC Emissions from Equipment Leaks. Canadian Council of Ministers of the Environment (CCME). 1993. Available upon request to CCME.

ISO 12913-1:2014 Acoustics—Soundscape—Part 1: Definition and conceptual framework. International Organization for Standardization. 2014. Available at <https://www.iso.org/cms/render/live/en/sites/isoorg/contents/data/standard/05/21/52161.html>

Birds, Migratory Birds and their Habitat

Audubon Christmas Bird Count. Audubon. Available at <http://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx>

Avoiding harm to migratory birds. Environment and Climate Change Canada. Available at <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html>

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General nesting periods of migratory birds. Environment and Climate Change Canada. Available at <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html>

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

Hanson, A., Goudie, I., Lang, A., Gjerdrum, C., Cotter, R., Donaldson, G. 2009. *A Framework for the Scientific Assessment of Potential Project Impacts on Birds*. Technical report series No. 508. Environnement Canada – Canadian Wildlife Service. Available at http://publications.gc.ca/collections/collection_2010/ec/CW69-5-508-eng.pdf

Mahon, C. Lisa and Shawna Pelech. Guidance for analytical methods to cumulative effects assessment for terrestrial species. *Environmental Reviews*. 29(2): 201-224. Available at <https://doi.org/10.1139/er-2020-0037> Milko, R. 1998. *Migratory birds environmental assessment guideline*. Environment Canada – Canadian Wildlife Service. Available at <http://publications.gc.ca/site/fra/9.647049/publication.html>

North American Breeding Bird Survey Website - Results. Available at <https://wildlife-species.canada.ca/breeding-bird-survey-results/P001/A001/?lang=e>

NatureCounts. Birds Canada, Avian Knowledge Network. Available at <https://www.birdscanada.org/birdmon/default/searchquery.jsp>

Nesting Calendar Query Tool. Birds Canada. Available at <https://www.birdscanada.org/apps/rnest/index.jsp>

North American Waterfowl Management Plan. NAWMP Canada. 2013. Available at <http://nawmp.wetlandnetwork.ca/what-is-nawmp/>

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Fish and Fish Habitat

A science-based framework for assessing the response of fisheries productivity to state of species or habitats. Fisheries and Oceans Canada. 2013. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/360944.pdf>.

Bradford, M.J., R.G. Randall, K.S. Smokorowski, B.E. Keatley and K.D. Clarke. 2014. *A framework for assessing fisheries productivity for the Fisheries Protection Program*. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/359758.pdf>

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Framework for Assessing Ecological Flow Requirements to Support Fisheries in Canada. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat. 2013. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/348881.pdf>

Guidance on the Identification of Critical Habitat in the Riparian Zone for Freshwater Species At Risk. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat. 2020. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/40940469.pdf>

Measures to Protect Fish and Fish Habitat. Fisheries and Oceans Canada. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>

Pathways of Effects. Fisheries and Oceans Canada. 2019. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html>

Policy for applying measures to offset adverse effects on fish and fish habitat under the Fisheries Act. Fisheries and Oceans Canada. 2019. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/policies-politiques-eng.html>

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Standards and Codes of Practice. Fisheries and Oceans Canada. 2021. Available online at <https://www.dfo-mpo.gc.ca/pnw-ppe/practice-pratique-eng.html>

Gender-based Analysis Plus

By the Numbers: Gender Diversity in Canada's Natural Resource Industries and Science, Technology, Engineering and Math (STEM), Submitted Brief. Natural Resources Canada. Available at <https://www.ourcommons.ca/Content/Committee/421/FEWO/Brief/BR8745320/br-external/NRC-e.pdf>

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Gender-Based Analysis Plus in Impact Assessment Fact Sheet. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/gender-based-analysis-plus-impact-assessment-fact-sheet.html>

Gender Diversity and Inclusion: A Guide for Explorers. Prospectors and Developers Association of Canada. 2020. Available at <https://www.pdac.ca/priorities/responsible-exploration/gender/gender-diversity-and-inclusion-guidance-document>

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Greenhouse Gases and Climate Change

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Eating Well with Canada's Food Guide—First Nations, Inuit and Métis. Health Canada. 2007. Available at <https://www.canada.ca/en/health-canada/services/food-nutrition/reports-publications/eating-well-canada-food-guide-first-nations-inuit-metis.html>

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Guidance for Evaluating Human Health Impacts in Environmental Assessments: Country Foods. Health Canada. 2017. Available at <https://publications.gc.ca/site/eng/9.855584/publication.html>.

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What are the social determinants of health? National Collaborating Centre for Determinants of Health. Available at <https://nccdh.ca/resources/entry/SDH-factsheet>

Indigenous Participation and Engagement

The Agency expects proponents to keep apprised of updated or new practitioner guidance or policies published on the Agency's website as may be the case over the course of a multi-year IA process. Best practices and current published guidance should be relied upon to the extent possible by proponents in developing their Impact Statement, and the following list of resources may be updated from time to time.

Indigenous Knowledge under the Impact Assessment Act: Procedures for Working with Indigenous Communities. Impact Assessment Agency of Canada. 2020. Available at

<https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/indigenous-knowledge-under-the-impact-assessment-act.html>

Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-assessment-potential-impacts-rights-indigenous-peoples.html>

Guidance: Collaboration with Indigenous Peoples in Impact Assessments. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/collaboration-indigenous-peoples-ia.html>

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Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/assessment-potential-impacts-rights-indigenous-peoples.html>

Protecting Confidential Indigenous Knowledge under the Impact Assessment Act – Supplementary Guidance to Indigenous Knowledge in Impact Assessment: Procedures for Working with Indigenous Communities. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/protecting-confidential-indigenous-knowledge-under-the-impact-assessment-act.html>

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The First Nations Principles of OCAP, First Nations Information Governance Centre, <https://fnigc.ca/ocap-training/>

United Nations Declaration on the Rights of Indigenous Peoples. United Nations. 2007. Available at <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

Public Participation

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

Guidance: Public Participation for Impact Assessment under the Impact Assessment Act. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-public-participation-impact.html>

Purpose and Need

Guidance: “Need for”, “Purpose of”, “Alternatives to” and “Alternative means”. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-need-for-purpose-of-alternatives-to-and-alternative-means.html>

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Social and Economic Conditions

Analyzing Health, Social and Economic Effects under the Impact Assessment Act. Impact Assessment Agency of Canada. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/analyzing-health-social-economic-effects-impact-assessment-act.html>

Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing. Impact Assessment Agency of Canada. 2015. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html>

Species at Risk

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Agency guidance documents are available from the [Practitioner's Guide to Federal Impact Assessments under the Impact Assessment Act](#)