



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

DRAFT GUIDELINES

**for the preparation
of an Environmental Impact Statement
pursuant to the
*Canadian Environmental Assessment Act, 2012***

Shelburne Basin Venture Exploration Drilling Project

Shell Canada Limited

January 17, 2014

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DISCLAIMER

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

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Part 1 - Background

1 INTRODUCTION

The purpose of this document is to identify for the proponent the information requirements for the preparation of an Environmental Impact Statement (EIS) for a designated project¹ to be assessed pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA, 2012). This document specifies the nature, scope and extent of the information required.

It is the responsibility of the proponent to provide sufficient data and analysis on any potential changes to the environment to permit a thorough evaluation of the environmental effects of the project by the Canadian Environmental Assessment Agency (the Agency). The EIS Guidelines set out minimum information requirements. It is the proponent's responsibility to provide any additional information required to assess the environmental effects of the project. Except where specified by the Agency, the proponent has the discretion to select the most appropriate methods to compile and present data, information and analysis in the EIS.

2 GUIDING PRINCIPLES

2.1 Environmental assessment as a planning tool

Environmental Assessment (EA) is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate the possible adverse effects of projects on the environment and to encourage decision makers to take actions that promote sustainable development.

2.2 Public participation

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

The overall objective of meaningful public participation is best achieved when all parties have a clear understanding of the proposed project as early as possible in the review process. The proponent is required to provide current information about the project to the public and especially to the communities likely to be most affected by the project.

2.3 Aboriginal consultation

One of the purposes of CEAA, 2012 is to promote communication and cooperation with Aboriginal peoples, including First Nations, Inuit and Métis. To work toward this goal, the proponent will ensure that it engages with Aboriginal people and groups that may be affected by the project or that have potential or established Aboriginal and Treaty rights and related interests in the project area, as early as possible in the project planning process. The proponent is strongly encouraged to work with Aboriginal groups in establishing an engagement approach. In addition,

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

the Aboriginal persons involved will have access to relevant information that allows them to understand the proposed project and to determine its impacts on their rights and interests. The proponent will make reasonable efforts to integrate “traditional Aboriginal knowledge” that will contribute to the assessment of environmental impacts.

All information gathered through the EA process and associated engagement by the proponent and consultation by government with Aboriginal peoples will be used to inform decisions under CEAA, 2012. This information will also inform the Crown’s understanding of the potential adverse impacts of the project on potential or established Aboriginal or Treaty rights and related interests, and the effectiveness of measures proposed to avoid or minimise those impacts.

3 PREPARATION AND PRESENTATION OF THE EIS

3.1 Agency guidance

The proponent is encouraged to consult relevant Agency Policy and Guidance² on topics to be addressed in the EIS. The proponent is further encouraged to consult with the Agency and federal authorities (see section 3.4.1) during the planning and development of the EIS materials.

3.2 Study strategy and methodology

The proponent is expected to respect the intent of the EIS Guidelines and to consider the effects that are likely to arise from the project (including situations not explicitly identified in these guidelines), the technically and economically feasible mitigation measures that will be applied, and the significance of any residual effects. It is possible that these guidelines may include matters that, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, the proponent will clearly indicate it and the justification for their conclusion provided so that the Agency, federal authorities, Aboriginal groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency disagrees with the proponent’s decision, it may require the proponent to provide the specified information.

In describing methods, the proponent will document how it used scientific, engineering, traditional and local knowledge to reach its conclusions. Assumptions will be clearly identified and justified. All data, models and studies will be documented such that the analyses are transparent and reproducible. All data collection methods will be specified. The uncertainty, reliability and sensitivity of models used to reach conclusions must be indicated.

All significant gaps in knowledge and understanding related to key conclusions presented in the EIS must be identified. The steps to be taken by the proponent to address these gaps will also be identified. Where the conclusions drawn from scientific and technical knowledge are inconsistent with the conclusions drawn from traditional knowledge, the EIS will contain a balanced presentation of the issues and a statement of the proponent’s conclusions.

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

3.3 Integration of EA, Aboriginal and public consultation information

In preparing the EIS, the proponent is encouraged to integrate Aboriginal and public consultation outcomes into the consideration and mitigation of environmental effects at the appropriate EA analytical steps shown on the next page (Figure 1). The proponent will ensure that public and Aboriginal concerns are well documented in the EIS. The proponent will identify and explain all unresolved questions or concerns as part of its analysis of the impacts of the project.

This information will help the Crown assess adequacy of consultation with Aboriginal groups, as set out in the *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult (2011)*³.

³ Visit the Aboriginal Affairs and Northern Development Canada website at: www.aadnc-aandc.gc.ca/eng/1100100014680/1100100014681

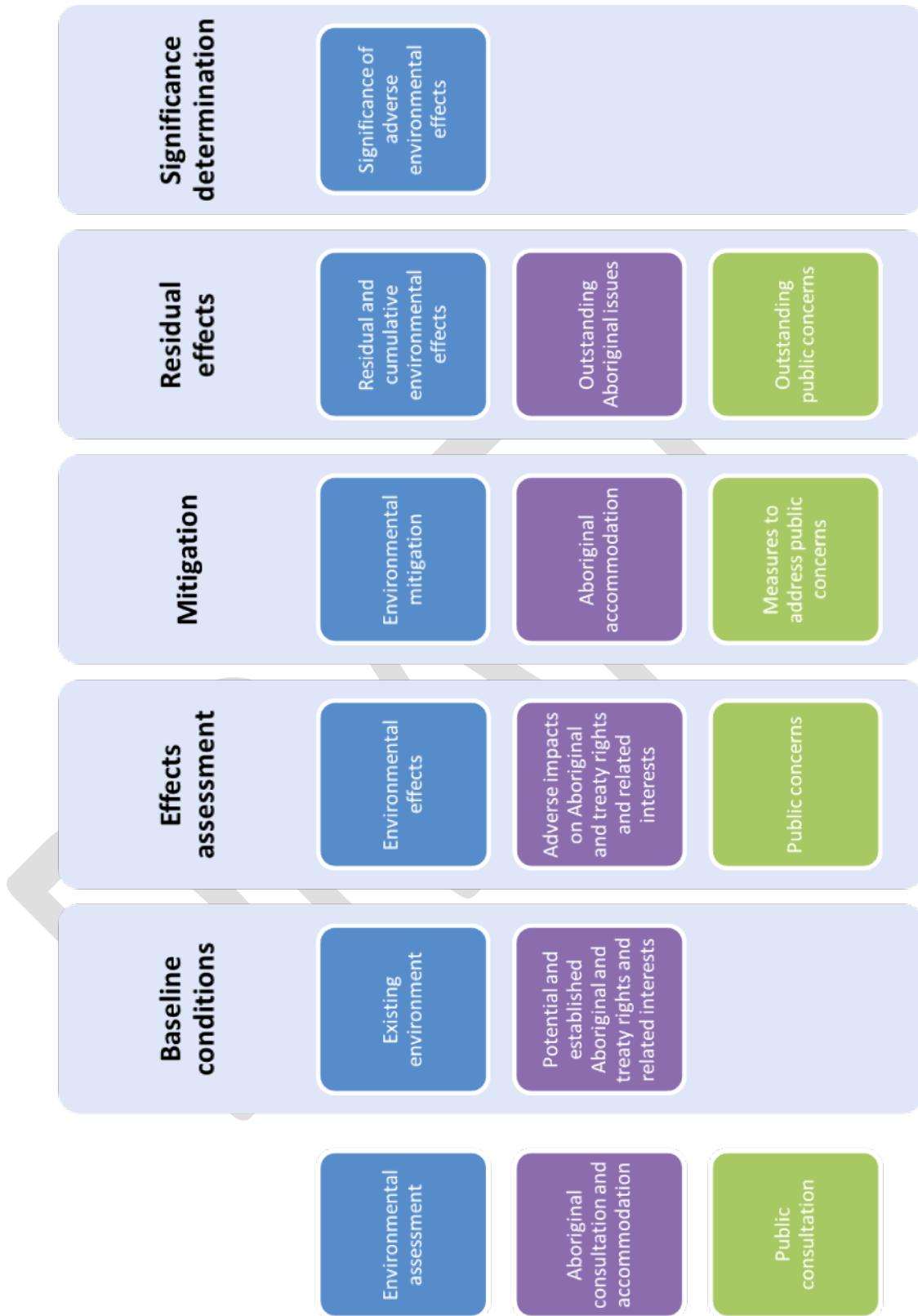


Figure 1. Integration of environmental assessment, Aboriginal and public consultation information into the Environmental Impact Statement.

3.4 Use of information

3.4.1 Scientific advice

Section 20 of CEAA, 2012 requires that every federal authority with specialist or expert information or knowledge with respect to a project subject to an EA make that information or knowledge available to the Agency. The Agency will advise the proponent of the availability of any pertinent information or knowledge so that it can be incorporated into the EIS, along with, as appropriate, expert and specialist knowledge provided by other levels of government.

3.4.2 Community knowledge and Aboriginal traditional knowledge

Sub-section 19(3) of CEAA, 2012 states that “the environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge”. For the purposes of these guidelines, community knowledge and Aboriginal traditional knowledge refers to knowledge acquired and accumulated by a community or an Aboriginal community, through generations of living in close contact with nature.

The proponent will incorporate into the EIS the community and Aboriginal traditional knowledge to which it has access or that is acquired through Aboriginal engagement activities, in keeping with appropriate ethical standards and without breaking obligations of confidentiality, if any. Agreement should be obtained from Aboriginal groups regarding the use, management and protection of their existing traditional knowledge information during and after the EA.

3.4.3 Existing information

In preparing the EIS, the proponent is encouraged to make use of existing information relevant to the project. However, when relying on existing information to meet requirements of the EIS Guidelines, the proponent will either include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e., through cross-referencing). When relying on existing information, the proponent will also comment on how the data have been applied to the project, clearly separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from the existing information.

3.4.4 Confidential information

In implementing CEAA, 2012, the Government of Canada is committed to promoting public participation in the environmental assessment of projects and providing access to the information on which environmental assessments are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the EA are included in the Canadian Environmental Assessment Registry (CEAR) and made available to the public on request. For this reason, the EIS will not contain:

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

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

3.5 Presentation and organization of the EIS

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

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

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

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

Part 2 – Content and Structure of the EIS

4 SUMMARY OF ENVIRONMENTAL IMPACT STATEMENT

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

- A concise description of all key components of the project and related activities;
- A summary of the consultation conducted with Aboriginal groups, the public, and government agencies, including a summary of the issues raised and the proponent's responses;
- An overview of the key environmental effects of the project and proposed technically and economically feasible mitigation measures; and
- The proponent's conclusions on the residual environmental effects of the project and the significance of adverse environmental effects after taking mitigation measures into account.

The summary is to be provided as a separate document and should follow the outline provided below:

1. Introduction and environmental assessment context
2. Project overview
3. Scope of project and assessment
4. Alternative means of carrying out the project
5. Public and Aboriginal engagement
6. Summary of environmental effects assessment
7. Mitigation measures
8. Proposed significance determination

The summary will have a sufficient level of detail for the reader to learn and understand the entire project, potential impacts, mitigation measures proposed by the proponent, the residual effects and the conclusions regarding significance.

Alternatively, the proponent may submit its EIS in both official languages, in which case a summary is not required.

5 INTRODUCTION AND PROJECT OVERVIEW

5.1 Geographical setting

The EIS will contain a concise description of the geographical setting in which the project will take place. This description will focus on those aspects of the project and its setting that are important in order to understand the potential environmental effects of the project. The description will address the natural and human elements of the environment as well as explain the

interrelationships between the biophysical environment and people and communities. The following information will be included:

- the coordinates of the main project site (latitude and longitude);
- current land use in the area and the relationship of the project facilities and components with any federal lands;
- the environmental significance and value of the geographical setting in which the project will take place and the surrounding area;
- environmentally sensitive areas, such as national, provincial and regional parks, ecological reserves, estuaries, Important Bird Areas, Migratory Bird Sanctuaries and habitats of federally or provincially listed species at risk and other sensitive areas that are within the project's potential zone of influence including accidents and malfunctions;
- local and Aboriginal communities; and
- traditional Aboriginal territories, treaty lands, Indian reserve lands.

The EIS will provide expanded description and mapping of the project location, including each of the project components as outlined in section 5.6 of this document.

Maps of the project's location at an appropriate scale will accompany the text. The location map should include the boundaries of the proposed site including coordinates, the major existing infrastructure, adjacent land uses and any important environmental features. In addition, site plans/sketches and photographs showing project location, site features and the intended location of project components will be included.

5.2 Regulatory framework and the role of government

To understand the context of the EA, this section will identify, for each jurisdiction, the government bodies involved in the EA as well as the EA processes. More specifically identify:

- any federal power duty or function to be exercised that may permit the carrying out (in whole or in part) of the project or associated activities;
- the environmental and other specific regulatory approvals and legislation that are applicable to the project at the federal, provincial, regional and municipal levels;
- government policies, resource management, planning or study initiatives pertinent to the project and/or EA and discuss their implications;
- any treaty or self-government agreements with Aboriginal groups that are pertinent to the project and/or EA;
- any relevant Land Use Plans, Land Zoning, or Community Plans; and
- a summary of the regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects.

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

5.3 Participants in the environmental assessment

Clearly identify the main participants in the EA including jurisdictions other than the federal government, Aboriginal groups, community groups, and environmental organizations.

5.4 The proponent

The proponent will:

- provide contact information (e.g. name, address, phone, fax, email);
- identify itself and the name of the legal entity that would develop, manage and operate the project;
- explain corporate and management structures, as well as insurance and liability management related to the project;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project;
- summarize key elements of its environment, health and safety management system and discuss how the system will be integrated into the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.

5.5 Purpose of the project

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

5.6 Project components

The proponent will describe the project, by presenting the project components, associated and ancillary works, activities, scheduling details, the timing of each phase of the project and other characteristics that will assist in understanding the environmental effects. This will include:

- maps, at an appropriate scale, of the project location;
- the project components;
- boundaries of the proposed site with coordinates;
- the major existing infrastructure;
- adjacent land uses; and
- any important environmental features.

If the project is part of a larger sequence of projects, the proponent will outline the larger context and present the relevant references, if available.

In its EIS, the proponent will describe:

- the Mobile Offshore Drilling Unit;

- port infrastructure and facilities, including any components that will be constructed in support of the project;
- site clearing, excavation, blasting, construction on shore (if any);
- the type of vessels that will be used and navigation activities (i.e., routes, number and frequency of trips);
- helicopters, including routes, number and frequency of trips;
- in-water work at the port and offshore;
- vertical seismic profile (VSP) surveys;
- reagent requirements (volumes, storage, types);
- petroleum products (source, volume, storage);
- the management or disposal of wastes on-shore and off-shore (e.g., type and constituents of waste, quantity, treatment requirement, method of disposal) including:
 - drilling muds, drill solids;
 - bilge and ballast water;
 - deck drainage;
 - cooling water;
 - fire control system test water;
 - operational discharges from subsea systems and the installation of subsea systems;
 - sewage and food wastes;
 - well treatment or testing fluids;
 - other operational discharges;
- contributions to atmospheric emissions, including emissions profile (type, rate and source);
- sources and extent of light, heat and noise;
- management of at-sea transfers of bulk materials (e.g. mud) and fuel; and
- number of employees and transportation of employees.

5.7 Project activities

The EIS will include expanded descriptions of the construction, operation, maintenance, foreseeable modifications, well testing, and where relevant, closure, decommissioning, abandonment and/or restoration of sites and facilities associated with the proposed project.

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

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

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

The EIS will provide the preliminary outline of a decommissioning plan for any components associated with the project and a well abandonment plan.

6 SCOPE OF PROJECT

The scope of project for the purposes of the EA includes the components described in section 5.6 and the physical activities described in section 5.7. The proponent will consider these components and activities in its environmental impact statement.

Based on the information received in the project description, the scope of the project to be assessed comprises the drilling, testing and abandonment of up to seven exploration wells offshore of Nova Scotia within the area of Shell Canada Limited's Exploration Licenses 2423, 2424, 2425, 2426, 2429 and 2430, including:

- the mobilization, operation and de-mobilization of a Mobile Offshore Drilling Unit designed for year-round operations in deep water and any proposed shipping exclusion zones;
- vertical seismic profile (VSP) surveys;
- any construction or modification of existing infrastructure undertaken at an onshore supply base in support of the project (e.g., installation of a mud plant);
- all activities at an existing onshore supply base in support of the project (e.g., staging, storage and transfer of supplies and equipment; operation of a facility for mixing drilling mud for delivery to the Mobile Offshore Drilling Unit via supply vessel);
- the loading and operation of marine support vessels (i.e., for re-supply and on-site safety during drilling activities) and helicopter support (i.e., for crew transport and delivery of light supplies and equipment) including transportation to the Mobile Offshore Drilling Unit.

7 SCOPE OF ASSESSMENT

7.1 Factors to be considered

7.1.1 Valued components

Valued Components (VCs) refer to attributes associated with the project that have been identified to be of concern by the proponent, government agencies, Aboriginal peoples and/or the public. The value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans.

The proponent will identify the VCs deemed appropriate to ensure the full consideration of the factors listed in subsection 19(1) of CEAA, 2012, as well section 79 of the *Species at Risk Act*. As a minimum, the proponent must consider the list of environmental components provided in section 9.1 of this document. The final list of VC to be presented in the EIS will be completed according to the evolution and design of the project and reflect the knowledge acquired on the

environment through public and Aboriginal consultations. The proponent will describe how the VCs were selected and what methods were used to predict and assess the adverse environmental effects of the project on these components.

The VCs will be described in sufficient detail to allow the reviewer to understand their importance and assess the potential for environmental effects arising from the project activities. The rationale for selecting these components as VCs and for excluding others will be stated. Challenges may arise regarding particular exclusions, so it is important to document the information and the criteria used to make each determination. Examples of justification include primary data collection, computer modelling, literature references, public consultation, expert input or professional judgement. If comments are received on a component that has not been included as a VC, these comments will be summarised and addressed in this section.

For consultations associated with the identification of VCs, the proponent will identify those VCs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or that the proponent considers likely to be affected by the project. In doing so, the proponent will indicate to whom these concerns are important and the reasons why, including Aboriginal, social, economic, recreational, and aesthetic considerations. The proponent will describe any issues raised or comments noted regarding the nature and sensitivity of the area within and surrounding the project and any planned or existing land and water use in the area. The proponent will also indicate the specific geographical areas or ecosystems that are of particular concern to interested parties, and their relation to the broader regional environment and economy.

7.1.2 Effects of potential accidents or malfunctions

The proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects), the plausible worst case scenarios and the effects of these scenarios.

The geographical and temporal boundaries for the assessment of malfunctions and accidents will be broader than the assessment of routine operations in relation to specific VCs. The analysis will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events.

The EIS will also describe the safeguards that have been established to protect against such occurrences and the contingency/emergency response procedures in place if accidents and/or malfunctions do occur.

Of particular concern with exploration drilling in the marine environment is the potential for accidental spills. This includes both low-probability, large-scale events (e.g., blowouts, either surface, sub-sea or underground) and smaller-volume spills that may occur more frequently. These incidents may affect the health and survival of plankton, fish eggs and larvae, juvenile and adult fish, marine mammals, marine birds, marine turtles, and marine invertebrates in the affected area. Fishing activity, including by Aboriginal peoples, and the marketability of seafood products harvested in the Nova Scotia offshore may also be adversely affected by a spill or blowout. The effects of accidental spills and blowouts will therefore require assessment in the EIS, including

trajectory modelling for all plausible large-scale spill scenarios that may occur. Results should be reported for each month of the year, and should include a projection for spills originating at the site and followed until the slick volume is reduced to a negligible amount, until a shoreline is reached, or until the slick moves out of the model domain. Spill scenarios should also consider potential worst-cases, such as when species at risk are present, or high concentrations of marine birds or fish. Where well locations have not yet been identified, points of origin selected for spill trajectory models should be conservative, for example by selecting a potential location within the proposed drilling area that is closest to a sensitive feature.

Based on the results of the spill modelling and analysis in the EIS, an emergency response plan for spills (small and large) and blowouts will be required. An outline of the emergency response plan along with key commitments is required in the EIS. The proponent should commit to finalizing the plan in consultation with regulators. The assessment shall include a determination of whether dispersants would provide any environmental benefit if used. If dispersants are to be used, the proponent shall consider associated environmental effects in the EIS and provide a plan for their use. The assessment shall include the means by which design and/or operational procedures, including follow-up measures, will be implemented to mitigate significant adverse effects from malfunctions and/or accidental events.

The potential to encounter shallow gas pockets, and associated implications, should also be discussed.

The EIS should also consider effects of accidents in the near-shore environment (e.g. spills, ship groundings) and of spills reaching shore; including effects on species at risk and their critical habitat, colonial nesters and concentrations of birds, and their habitat.

7.1.3 Effects of the environment on the project

The EIS will take into account how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g., waves, wind, currents, fire, seismic events) could adversely affect the project and how this in turn could result in impacts to the environment (e.g., extreme environmental conditions result in malfunctions and accidental events). These events will be considered in different probability patterns (i.e. 5-year vs. 100-year recurrence interval). This discussion will include a description of climate data used.

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

7.2 Scope of the factors

Scoping establishes the boundaries of the EA and focuses the assessment on relevant issues and concerns. The spatial and temporal boundaries used in the EA may vary depending on the VC.

7.2.1 Spatial boundaries

The EIS will clearly indicate the spatial boundaries to be used in assessing the potential adverse environmental effects of the proposed project and provide a rationale for each boundary. It is recognized that the spatial boundaries for each VC may not be the same.

Spatial boundaries will be defined taking into account as applicable the appropriate scale and spatial extent of potential environmental effects, community and Aboriginal traditional knowledge, current land and resource use by Aboriginal groups, ecological, technical and social and cultural considerations. The description of the project setting will be presented in sufficient detail to address the relevant environmental effects of the project.

The proponent is advised to consult with the Agency, federal and provincial government departments and agencies, local government and Aboriginal groups, and take into account public comment when defining the spatial boundaries used in the EIS.

7.2.2 Temporal boundaries

The temporal boundaries of the EA will span all phases of the project: construction, operation, maintenance, foreseeable modifications, well testing, and where relevant, closure, decommissioning, abandonment or restoration of the sites affected by the project. Temporal boundaries will also consider variations related to VCs for all phases of the project, where appropriate. Community and Aboriginal traditional knowledge should factor into decisions around appropriate temporal boundaries.

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

8 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

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

Identify the alternative means to carry out the project.

- Develop criteria to determine the technical and economic feasibility of the alternative means; and,
- Identify those alternative means that are technically and economically feasible, describing each alternative means in sufficient detail.

Identify the effects of each alternative means.

- Identify those elements of each alternative means that could produce effects in sufficient detail to allow a comparison with the effects of the project; and
- The effects referred to above include both environmental effects and potential adverse impacts on potential or established Aboriginal and Treaty rights and related interests.

Identify the preferred means.

- Identify the preferred means based on the relative consideration of effects; and of technical and economic feasibility; and
- Determine criteria to examine the effects of each remaining alternative means to identify the preferred means.

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

- choice of drilling fluid (i.e. WBM or SBM);
- management of drilling wastes (i.e. disposal on seabed or into water column, recover and ship to shore, re-inject); and
- alternative ways to light the platform at night (or flare at night when testing the well), to reduce attraction and associated mortality of birds, such as by installing flare shields.

The *Offshore Waste Treatment Guidelines*⁴ include minimum performance targets for concentrations and volumes of waste material in discharges resulting from offshore exploration and development. Offshore operators are expected to take all reasonable measures to minimize the volumes of waste materials generated by their operations, and to minimize the quantity of substances of potential environmental concern contained within these waste materials. The proponent should discuss any alternatives that would enable it to achieve these objectives and adopt best practices in waste management and treatment.

The *Offshore Chemical Selection Guidelines* provide a framework for the selection of chemicals in support of offshore operations. The guidelines outline minimum expectations on the selection of lower toxicity chemicals; recognizing that variations to the selection process described in the guidelines may be required in areas where increased risk to the environment has been identified. With the objective of minimizing potential environmental impacts of discharges to the marine environment, the proponent should identify the quantity and type of chemicals (or constituents) that may be used in support of the proposed project that are:

- included on the Canadian Environmental Protection Act's List of Toxic Substances;
- not included on the OSPAR[1] Pose Little or No Risk to the Environment (PLONAR) list of chemicals and have a PARCOM[2] Offshore Chemical Notification Scheme Hazard Rating of A, B or purple, orange, blue, or white; or
- not included on the PLONAR list of chemicals and have not been assigned a PARCOM Offshore Chemical Notification Scheme Hazard Rating.

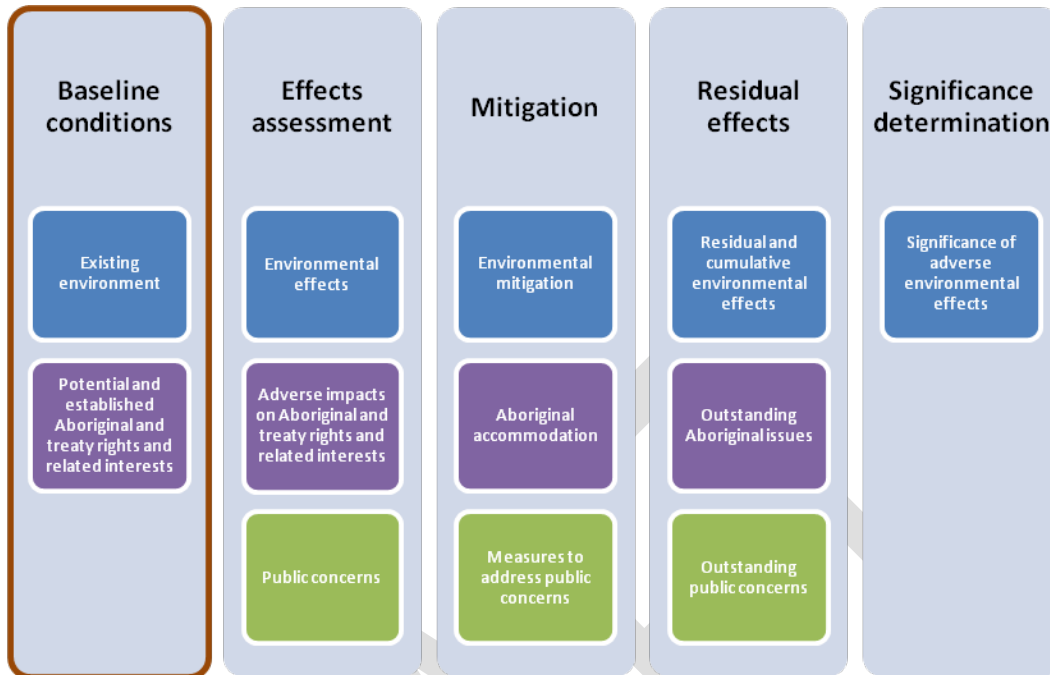
Alternatives to the use of the above-listed chemicals (e.g., through alternative means of operating or use of less-toxic alternatives) should be discussed in the EIS.

⁴ National Energy Board, Canada-Nova Scotia Offshore Petroleum Board and Canada-Newfoundland Offshore Petroleum Board. *Offshore Waste Treatment Guidelines*. December 2010. Available from: www.cnsopb.ns.ca

[1] Oslo and Paris Commissions

[2] Paris Commission

9 BASELINE CONDITIONS



9.1 Existing environment

9.1.1 Methodology

The EIS will include a description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions as well as the variability in these components, processes and interactions over time scales appropriate to the project. The description will be sufficiently detailed to characterize the environment before any disturbance to the environment due to the project and to identify, assess and determine the significance of the potential adverse environmental effects of the project. This data should include results from studies done prior to any physical disruption of the environment due to initial site clearing activities. The information describing the existing environment may be provided in a stand-alone chapter of the EIS, be integrated into clearly-defined sections within the effects assessment of each VC, or, where appropriate, be included by reference to available external documents. This analysis will include environmental conditions resulting from historical and present activities in the local and regional study area.

In describing the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent will identify and justify the indicators and measures of ecosystem health and integrity used for analysis and relate these to the identified VCs and proposed monitoring and follow-up measures.

For the biophysical environment, baseline data in the form of inventories alone are not sufficient to assess effects. The proponent will consider the resilience of relevant species populations, communities and their habitats. The proponent will summarize all pertinent historical information on the size and geographic extent of relevant animal populations as well as density, based on

best available information. Where little or no information is available, but is required to conduct the assessment and identify mitigation measures, specific studies will be designed to gather further information on species populations, densities and the interrelations of these species to the ecosystem.

Habitat at regional and local scales should be defined in ecological mapping of aquatic vegetation types and species. Habitat use will be characterized by type of use (e.g. spawning, breeding, migration, feeding, nursery, rearing, wintering), frequency and duration. This assessment will consider all relevant variations for all VCs as appropriate. Emphasis will be on those species, communities and processes identified as VCs. However, the interrelations of these components and their relation to the entire ecosystem and communities of which they are a part will be indicated (e.g. population-level risk assessment). The proponent will address issues such as habitat, nutrient and chemical cycles, food chains, productivity, to the extent that they are appropriate to understanding the effect of the project on ecosystem health and integrity. Range and probability of natural variation over time will also be considered. The proponent will also examine changes in the distribution, populations, behaviour, and availability of wildlife and fish in the context of implications to current use of lands and resources by Aboriginal peoples.

If the baseline data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations will be described and will include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error.

9.1.2 Biophysical environment

Based on the scope of project described in section 6, the proponent will present the following baseline information to facilitate the identification of VCs for the purposes of the environmental assessment. Should other VCs be identified during the conduct of the EA, these components will also be described in the EIS.

Atmospheric Environment and Climate

The EIS will describe the following:

- ambient air quality in the project area including but not limited to the following contaminants: total suspended particulates, PM2.5, PM10, SOx, VOCs and NOx;
- relevant weather parameters such as wind speed and direction, precipitation, visibility and storm events in the drilling area.

Relevant marine climate data sources should be consulted, such as the Sable Island weather station, the Environment Canada weather buoys project (the Lahave Bank Buoy, World Meteorological Organization), the International Comprehensive Atmosphere Ocean Dataset (ICOADS), the United States of America National Oceanographic and Atmospheric Administration (NOAA) database of tropical cyclone activity in the North Atlantic and the Canadian Lightning Detection Network.

Marine Mammals

The EIS will identify:

- marine mammal species that may be present, the times of year they are present, the ranges of the species and their migration patterns and how these may be affected by the project, including underwater noise; and
- important areas in the vicinity of the drilling sites or supply routes (e.g., for mating, breeding, feeding and nursing of young) or that could be impacted by the project (e.g., acoustics, spills, etc.).

Species at risk and species of conservation concern should be identified, but will be assessed as a separate VC.

Marine Turtles

The EIS will identify:

- marine turtle species that may be present, the times of year they are present, the ranges of the species and their migration patterns; and
- important areas in the vicinity of the drilling sites or supply routes (e.g., for mating, breeding, feeding, nursing of young) or that could be impacted by the project (e.g., routine discharges, spills, etc.).

Species at risk and species of conservation concern should be identified, but will be assessed as a separate VC.

Special Areas

The EIS will describe special areas (e.g., Species at risk critical habitat, Important Bird Areas, Migratory Bird Sanctuaries, National Parks, Provincial Parks, ecological reserves, etc.) that may be affected by the project, either as a result of routine operations (e.g., at the Mobile Offshore Drilling Unit or supply vessels) or accidents and malfunctions including, but not limited to:

- the Georges Bank Moratorium Area;
- the Roseway Basin North Atlantic Right Whale Critical Habitat;
- the Northeast Channel Coral Conservation Area;
- the Haddock Nursery Closure Area (a.k.a. the Haddock Box);
- Ecologically and Biologically Significant Areas, particularly the Scotian Shelf and Slope Break EBSA, in which the drilling will occur;
- Sable Island;
- the Lobster Closure Area (LFA 40);
- the Redfish Nursery Closure Area;
- the Gully Marine Protected Area.

Fish and Fish Habitat

To support analysis of the project's effects the EIS will:

- characterize fish populations on the basis of species and life stage for affected waters;
- list any rare fish or invertebrate species that are known to be present; and

- describe the physical and biological characteristics of the fish and fish habitat likely to be directly or indirectly affected by the project.

Species at risk and species of conservation concern should be identified, but will be assessed as a separate VC.

Emphasis will be placed on the waters likely to be affected by the project and their physical characteristics, water and sediment quality. Hence, for all areas in which effects are anticipated, the EIS will describe the biophysical water and sediment characteristics, including:

- a description of fish habitat as determined by water depths, type of substrate (sediments) and aquatic vegetation. It is recommended that photos be attached to the description, if available;
- quality, thickness, grain size and mobility of bottom sediments;
- available bathymetry information for the drilling site and maximum and mean depths;
- a discussion of sea bottom stability at the project site;
- benthic flora and fauna and their associated habitat, including sensitive features such as corals and sponges; a benthic habitat survey (ROV / camera), including transects of seafloor in the area of the well locations, may be required;
- surface and subsurface current patterns, current velocities, waves, storm surges, long shore drift processes, tidal patterns, and existing tide gauge levels for the site, in proximity to the site, and along the supply routes;
- acoustic environment (ambient noise levels from natural sources, shipping, seismic surveys, and other sources), including information on geographic extent and temporal variations and how the acoustic environment may be affected by the project; and
- water quality parameters (e.g. water temperature, turbidity, salinity and pH).

When describing the baseline marine environment, relevant data sources should be consulted. In addition to data sources discussed under *Atmospheric Environment and Climate* (some of which contain marine data), the proponent should consult MSC50 Wind and Wave Hindcast Data for the North Atlantic, long term hourly wave measurements from the Environment Canada weather buoy in the project area, as well as the US National Data Buoy Center's Georges Bank buoy formerly deployed to the west of the area and DFO archives of hourly wave measurements from offshore platforms and co-located wave buoys operating on the Scotian Shelf and Slope.

The EIS should present habitat maps at a suitable scale indicating areas of spawning, nursery, feeding, migration routes, etc.

Disposal of drilling waste (i.e., cuttings) is expected to be a primary cause of effects to marine benthos. The EIS should indicate the areal extent of drilling waste deposition at various stages of drilling, including during riserless drilling and drilling with the marine riser in place, using dispersion modeling if necessary.

Fish sampling survey methods used (if conducted) will be described in order to allow experts to ensure the quality of the information provided. If studies on fish and fish habitat were carried out previously, they are to be submitted with the EIS.

For all waters which the project is likely to affect, the EIS will:

- describe the fish species present on the basis of the surveys carried out and the data available (e.g. electric and experimental fishing, government and historical databases,

sport or commercial fishing data). Identify the sources of the data and provide the information concerning the fishing carried out (e.g. location of sampling stations, catch methods, date of catches, species);

- specify the location of potential or confirmed fish habitats and describe how they are used by fish (spawning, rearing, growth, feeding, migration, overwintering);
- locate and describe suitable habitats for species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area; and
- document any vertical seismic survey or other noise that may affect fish behaviour, such as spawning or migration.

Marine Birds

The EIS will describe migratory and non-migratory marine birds and their habitat at the project site and within areas that could be affected by routine project operations or accidents and malfunctions or accidents, such as:

- noise disturbance from seismic equipment including both direct effects (physiological), or indirect effects (foraging behaviour of prey species);
- physical displacement as a result of vessel presence (e.g., disruption of foraging activities);
- night-time illumination levels from lights and flares during different weather conditions and seasons and different operating conditions, and associated nocturnal disturbance (e.g., increased opportunities for predators, attraction to MODU and vessels and subsequent collision or exposure to vessel-based threats, incineration in flares, disruption of normal activities);
- exposure to spilled contaminants (e.g., fuel, oils) and operational discharges (e.g., deck drainage, gray water, black water); and
- attraction of, and increase in, predator species as a result of waste disposal practices (i.e., sanitary and food waste) and the presence of incapacitated/dead prey behind the vessel.

Migratory birds are protected under the *Migratory Birds Convention Act* (MBCA) and associated regulations. Preliminary data from existing sources will be gathered, including information such as:

- abundance, distribution, and life stages of birds in the area, including species composition for each season;
- a characterization of year-round migratory bird use of the area (e.g. over-wintering, spring migration, breeding season, fall migration);
- areas of concentration of migratory birds, such as for breeding, feeding or resting;

In addition to information obtained from naturalists or Aboriginal peoples, other relevant datasets should be consulted, such as those available from the Canadian Wildlife Service (e.g. Eastern Canadian Seabirds at Sea (ECSAS), Programme intégré de recherches sur les oiseaux pélagiques (PIROP)), the Nova Scotia Department of Natural Resources (for information on tern colonies) and the Atlantic Canada Conservation Data Centre.

Existing data will be supplemented by surveys, where necessary. The results of any baseline surveys and a description of the methodology will be included. Surveys should be designed with

reference to the Canadian Wildlife Service's guidance such as Technical Report No. 508, *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson *et al.* 2009). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impacts on migratory birds.

Species at Risk and Species of Conservation Concern

As background for the analysis of the project's effects on species at risk, the EIS will:

- identify all species at risk that may be affected by the project, using existing data and literature as well as surveys to provide current field data, as appropriate;
- incorporate any published studies that describe the regional importance, abundance and distribution of species at risk;
- identify residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project; and
- consult recovery strategies for information on the critical habitat of endangered and threatened species, and consult management plans for information on habitat use of species of special status.

The following information sources on species at risk and species of conservation concern should be among those consulted:

- Species at Risk Act Registry (www.sararegistry.gc.ca);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Relevant government agencies;
- Local naturalist and interest groups; and
- Aboriginal groups and First Nations.

9.1.3 Human environment

The definition of the human environment will be interpreted broadly and include areas that may be affected by accidents and malfunctions. Based on the scope of project described in section 6, the following VCs will be identified and described in the relevant sections of the EIS:

- Current use of land and resources for traditional purposes by Aboriginal peoples;
- Commercial and recreational fisheries;
- Human health, with respect to potential contamination of food sources, noise and air quality issues as applicable;
- Other ocean use (e.g. shipping, research, oil and gas, military activities, ocean infrastructure (e.g., sub-sea cables)); and
- Physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

In describing how the project may impede other uses as listed above, the EIS will:

- identify any Project components and a description of any activities (e.g., exclusion zones) that may affect other uses;

- describe current commercial or recreational fishing activity in the project area that may be affected, including licence holders and species fished;
- describe any recreational uses of near-shore waters (i.e., swimming, canoeing, boating) that may be affected by the project; and
- provide information on current and historical use of all waters that may be affected by the project, including current Aboriginal uses, where available.

This is a minimum list that is not meant to be exhaustive. The proponent may include other human environment VCs in the EIS.

In describing the socio-economic environment, the proponent will provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities and Aboriginal peoples in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. A description of the rural and urban settings likely to be affected by the project will be provided.

In describing physical and cultural heritage, the proponent will provide information on heritage resources, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

In describing current uses of land and resources by Aboriginal groups for traditional purposes, the proponent will describe fishing activity, either for commercial or traditional purposes (e.g., communal gathering of fish for feasts) within the project's potential zone of influence. Potential effects on current uses include access to areas that are of importance or concern to Aboriginal groups.

The EIS should also discuss the potential to encounter unexploded ordnance (UXOs).

9.2 Potential or established Aboriginal and Treaty rights and Related Interests

For the purposes of developing the EIS, the proponent will engage with Aboriginal groups whose potential or established Aboriginal rights and Treaty rights and related interests may be affected by the project.

The proponent will hold meetings and facilitate these by making key EA summary documents (baseline studies, EIS and key findings) accessible and making plain language summaries of these documents available to the following groups:

Nova Scotia:

- Acadia First Nation
- Annapolis Valley First Nation
- Bear River First Nation
- Chapel Island First Nation
- Eskasoni First Nation
- Glooscap First Nation
- Membertou First Nation
- Millbrook First Nation
- Paqtnkek (Afton) First Nation
- Pictou Landing First Nation
- Shubenacadie (Indian Brook) First Nation

- Wagmatcook First Nation
- Wekoqmaq (Whycocomagh) First Nation

New Brunswick:

- Fort Folly First Nation
- St. Mary's First Nation
- Woodstock First Nation

The proponent will ensure that the groups' views are heard and recorded.

In preparing the EIS, the proponent will ensure that Aboriginal groups, especially those most likely to be affected by the project, have access to timely and relevant information that they require in respect of the project and how the project may adversely impact them.

For the Aboriginal groups previously identified by the Agency, the proponent will hold meetings and facilitate these by making key EA summary documents (baseline studies, EIS and key findings) accessible and making plain language summaries of these documents.

At a minimum, the EIS will summarize available information on the potential or established Aboriginal and Treaty rights and related interests of the named Aboriginal groups that have the potential to be adversely impacted by the project. As part of this summary, the EIS will include for each Aboriginal group:

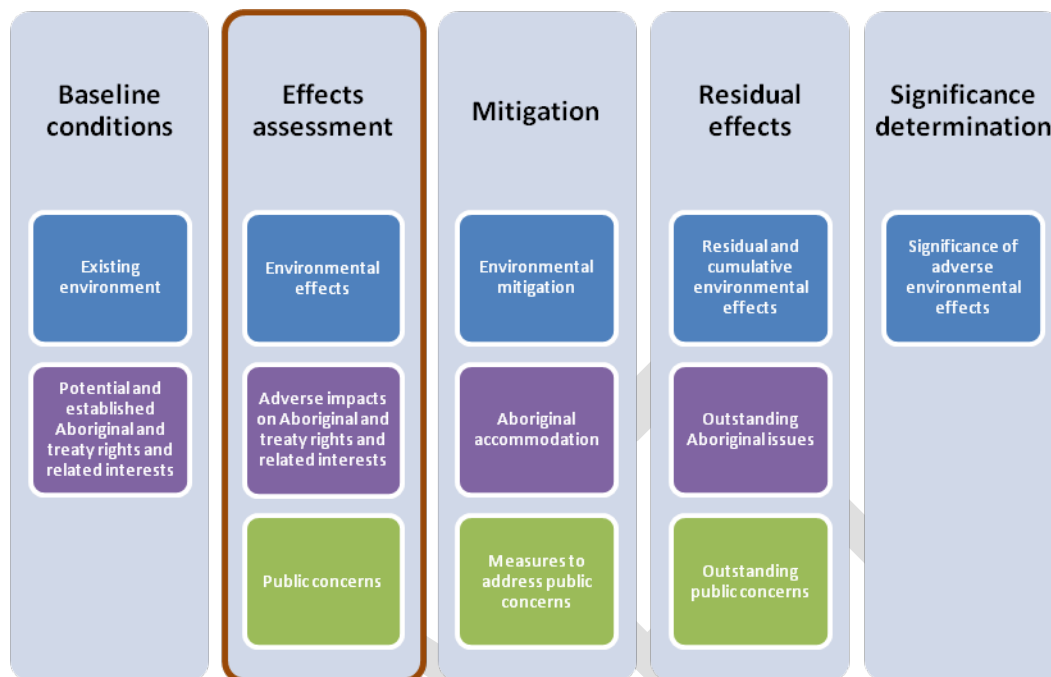
- Background information and a map of the group's traditional territory;
- A summary of engagement activities conducted prior to the submission of the EIS, including the date and means of engagement (e.g., meeting, mail, telephone);
- Information on each group's potential or established rights (including geographical extent, nature, frequency, timing), including maps and data sets (e.g. fish catch numbers) when this information is provided by a group to the proponent;
- An overview of key comments and concerns provided by each group to the proponent;
- Responses provided by government and/or the proponent, as appropriate;
- Future planned engagement activities; and
- Efforts undertaken to engage with Aboriginal groups as part of developing the information identified above.

The proponent will describe all efforts, successful or not, taken to solicit the information required to prepare the EIS.

The Agency will provide additional instructions to the proponent in cases where further research and/or engagement effort by the proponent is required to support Canada's ability to fulfil the duty to consult with one or more Aboriginal groups that may be adversely affected by the project.

Should the proponent have knowledge of potential adverse impacts to an Aboriginal group not appearing on the above list, the proponent will bring this to the attention of the Agency at the earliest opportunity.

10 EFFECTS ASSESSMENT



10.1 Environmental effects

10.1.1 Methodology

The proponent will indicate the project's effects during construction, operation, maintenance, foreseeable modifications, well testing and abandonment and where relevant, closure, decommissioning and restoration of sites and facilities associated with the project, and describe these effects using appropriate criteria. To the maximum extent possible, this documentation will include, for each potential project-related environmental effect, an indication of the nature of the effect, mechanism, magnitude, duration, frequency, geographic extent, and the degree to which it may be reversible. The proponent will consider both the direct and indirect, reversible and irreversible, short- and long-term environmental effects of the project. In predicting and assessing the project's effects, the proponent will indicate important details and clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact.

The assessment of the effects of each of the project components and physical activities, in all phases, will be based on a comparison of the biophysical and human environments between the predicted future conditions with the project and the predicted future conditions without the project. In undertaking the environmental effects assessment, the proponent will use best available information and methods. All conclusions will be substantiated. Predictions will be based on clearly stated assumptions. The proponent will describe how it has tested each assumption. With respect to quantitative models and predictions, the proponent will discuss the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.

Risk assessment framework

The proponent is expected to employ, where appropriate, standard ecological risk assessment frameworks that categorize the levels of detail and quality of the data required for the assessment. These tiers are as follows:

Tier 1: Qualitative (expert opinion, including traditional and local knowledge, literature review, and existing site information);

Tier 2: Semi-quantitative (measured site-specific data and existing site information); and,

Tier 3: Quantitative (recent field surveys and detailed quantitative methods).

Thus, if the Tier 2 assessment still indicates a potential for effects to VCs, a Tier 3 assessment may need to be conducted to reduce the level of uncertainty. If the risk characterization component is uncertain this may necessitate the probabilistic modelling of the population-level consequences of the proposed project.

Biophysical changes to the environment that may impact human health include changes to: air quality, water quality, noise levels (at supply base), and contaminants in fish for human consumption. Such changes in the biophysical environment, as described in Section 9 (Baseline Environment), can impact human health. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health.

Impact matrix

An impact matrix methodology in combination with identification of VCs should be used to evaluate environmental effects of the proposed project, including those related to Aboriginal peoples. The assessment will include the following general steps:

- identification of the activities and components of the project;
- predicting/evaluating the likely effects on identified valued components;
- identification of technically and economically feasible mitigation measures for any significant adverse environmental effects;
- determination of any residual environmental effects;
- ranking of each residual adverse environmental effect based on various criteria; and,
- determination of the potential significance of any residual environmental effect following the implementation of mitigation.

Application of precautionary approach

In documenting the analyses included in the EIS, the proponent will:

- demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to ensure that they would not cause serious or irreversible damage to the environment, especially with respect to environmental functions and integrity, system tolerance and resilience, and/or the human health of current or future generations;
- outline and justify the assumptions made about the effects of all aspects of the project and the approaches to minimize these effects;

- Ensure that in designing and operating the project, priority has been and would be given to strategies that avoid the creation of adverse effects;
- Develop contingency plans that explicitly address accidents and malfunctions; and
- Identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists in the prediction of effects.

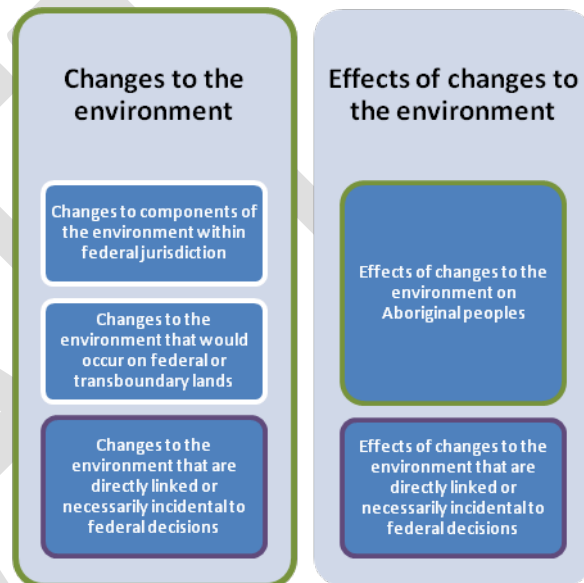
10.1.2 Changes to the environment

Section 5 of CEAA, 2012 describes specific categories of direct and indirect environmental effects that will be considered in the EA (see Figure 2). However, to be able to assess these categories of environmental effects, a complete understanding of the changes the project will cause to the environment is required, including changes that are directly linked or necessarily incidental to any federal decisions that would permit the project to be carried out.

The EIS will describe any change that may be caused by the project (as scoped in section 6 of this document) on the environment, which is defined as the components of the Earth, including:

- Land, water and air, including all layers of the atmosphere;
- All organic and inorganic matter and living organisms; and
- The interacting natural systems that include the components described above.

These descriptions will be integrated into the effects assessment sections of each VC included in the EIS.



Changes to components of the environment within federal jurisdiction

The EIS will include a stand-alone section that summarises those changes that may be caused by the project on the components of the environment listed in paragraph 5(1)(a) of CEAA, 2012, namely fish and fish habitat, aquatic species and migratory birds.

Changes to the environment that would occur on federal or transboundary lands

The EIS will include a stand-alone section that summarises any change the project may cause to the environment that may occur on federal lands or lands outside the province in which the project is to be located (including outside of Canada).

Changes to the environment that are directly linked or necessarily incidental to federal decisions

In situations where the project requires one or more federal decisions identified in section 5(2), the EIS will also include a stand-alone section that describes any change that may be caused by the project on the environment that is directly linked or necessarily incidental to these decisions.

10.1.3 Effects of changes to the environment

Effects of changes to the environment on Aboriginal peoples

The EIS will describe the effects of any changes the project may cause to the environment, with respect to Aboriginal peoples, on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Effects of changes to the environment that are directly linked or necessarily incidental to federal decisions

In situations where the EIS has identified changes to the environment that are directly linked or necessarily incidental to federal decisions identified in section 5.2, the EIS will also include a stand-alone section that describes the effects of these changes on health and socio-economic conditions, physical and cultural heritage, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, other than as they pertain to Aboriginal peoples (who are considered in the previous section).

10.2 Adverse Impacts on Aboriginal and Treaty Rights and Related Interests

The EIS will describe, from the perspective of the proponent, the potential adverse impacts of the project on the ability of Aboriginal peoples to exercise the potential or established Aboriginal and Treaty rights and related interests identified in section 9.2. As part of this description, this section will summarise:

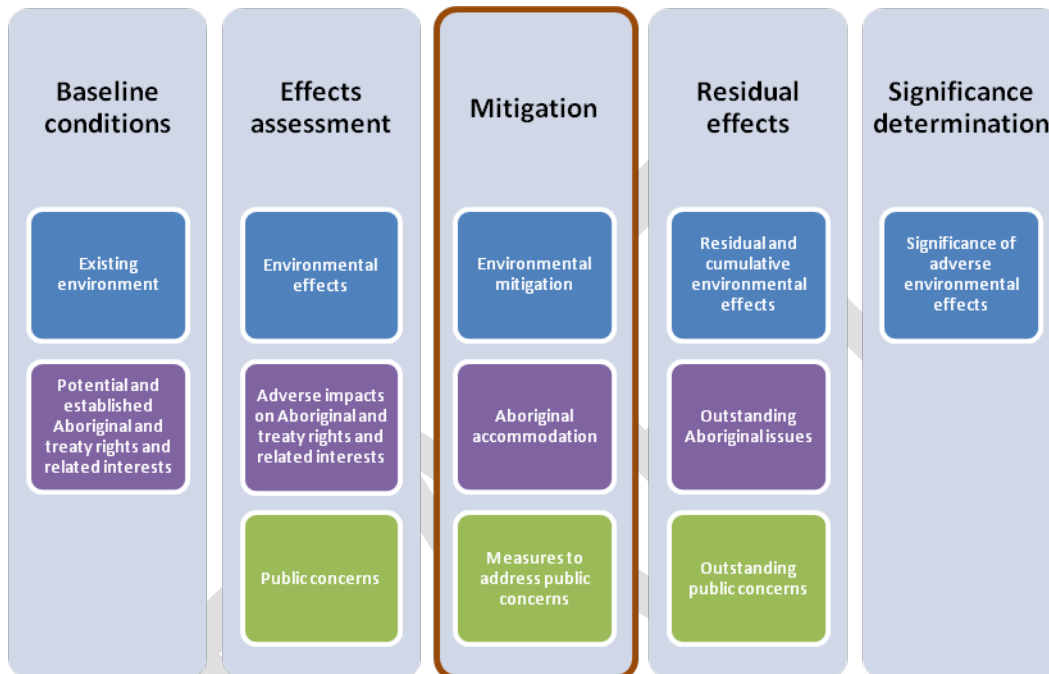
- Potential adverse impacts (on potential or established Aboriginal and Treaty rights and related interests) that were identified through the environmental effects described in sections 10.1.2 and 10.1.3;
- Specific issues and concerns raised by Aboriginal groups in relation to the potential adverse impacts of the project on potential or established Aboriginal and Treaty rights and related interests;
- VCs suggested for inclusion in the EIS, whether or not those factors were included, and the rationale for any exclusions;
- Where and how Aboriginal traditional knowledge or other Aboriginal views were incorporated into the consideration of environmental effects and potential adverse impacts on potential or established Aboriginal and Treaty rights and related interests; and
- Efforts undertaken to engage with Aboriginal groups as part of collecting the information identified above.

The assessment of the potential adverse impacts of each of the project components and physical activities, in all phases, will be based on a comparison of the exercise of the identified rights between the predicted future conditions with the project and the predicted future conditions without the project. It is recommended that the impact matrix methodology described in section 10.1.1 be adapted for this purpose.

10.3 Public concerns

This section will detail public concerns raised in relation to the project, including through public consultation conducted prior to the preparation of the EIS, and/or community knowledge that may have been provided.

11 MITIGATION



11.1 Environmental mitigation

11.1.1 Methodology

Every EA conducted under CEAA, 2012 will consider clear, enforceable measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the project or relocation of project components.

The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The proponent will then describe its environmental protection plan and its environmental management system, through which it will deliver this plan. The plan will provide an overall perspective on how potentially adverse effects would be minimized and managed over time.

The EIS will then describe mitigation measures that are specific to each environmental effect identified in section 10.1. Measures will be written as specific commitments that clearly describe how the proponent intends to implement them. Where mitigation measures have been identified

in relation to species and/or critical habitat listed under the *Species at Risk Act*, the mitigation measures will be consistent with any applicable recovery strategy and action plans.

The EIS will describe proponent commitments, policies and arrangements directed at promoting beneficial or mitigating adverse socio-economic effects. The EIS will further discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs.

The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various phases (construction, operation, modification, well testing, decommissioning, abandonment or other undertaking related to the project) to eliminate or reduce the significance of adverse effects. The impact statement will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit.

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

Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective will be clearly and concisely described. In addition, the EIS will identify the extent to which technology innovations will help mitigate environmental effects. Where possible, it will provide detailed information on the nature of these measures, their implementation, management and the development of the Follow-up Program as described in section 11.4.

Adaptive management is not considered a valid mitigation measure, but if the Follow-up Program indicates that corrective action is required, the proposed approach for managing the response should be identified.

11.1.2 Summary of environmental mitigation

In addition, the EIS will summarise the mitigation measures, follow-up and related commitments identified to address the categories of environmental effects specified in section 10:

- Changes to components of the environment within federal jurisdiction;
- Changes to the environment that would occur on federal or transboundary lands;
- Changes to the environment that are directly linked or necessarily incidental to federal decisions;
- Effects of changes to the environment on Aboriginal peoples; and
- Effects of changes to the environment that are directly linked or necessarily incidental to federal decisions.

11.2 Measures to address impacts on Aboriginal rights

This section will describe, from the perspective of the proponent, the measures identified to mitigate the potential adverse impacts of the project described in section 10.2 on the potential or established Aboriginal and Treaty rights and related interests identified in section 9.2. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them. This description will include a summary of:

- Specific suggestions raised by Aboriginal groups for mitigating the potential adverse impacts of the project on potential or established Aboriginal and Treaty rights and related interests in relation to environmental effects specified in sections 10.1.2 and 10.1.3;
- Environmental mitigation measures identified in section 11.1 that also serve to address potential adverse impacts on potential or established Aboriginal and Treaty rights and related interests;
- Any potential cultural, social and/or economic impacts or benefits to Aboriginal groups that may arise as a result of the project;
- Where and how Aboriginal traditional knowledge or other Aboriginal views were incorporated into the mitigation of environmental effects of potential adverse impacts on potential or established Aboriginal and Treaty rights and related interests; and
- Efforts undertaken to engage with Aboriginal groups as part of developing the information identified above.

In preparing the EIS, the proponent will ensure that Aboriginal people and groups have access to the information that they require in respect of the project and of how it may impact them. The proponent will describe all efforts, successful or not, taken to solicit the information required to prepare the EIS.

The proponent will structure its Aboriginal engagement activities to provide adequate time for Aboriginal groups to have reviewed the relevant information in advance and to ensure there are sufficient opportunities for individuals and groups to provide oral input in the language of their choosing. Consultation activities must be appropriate to the groups' needs and should be arranged through discussions with the groups.

11.3 Measures to address public concerns

This section will describe measures identified for addressing public concerns in relation to the project identified in section 10.3. Measures will be written as specific commitments that clearly describe how the proponent intends to implement them.

For any consultations undertaken with the general public, the EIS will describe the ongoing and proposed consultations and information sessions with respect to the project at the local, regional and provincial levels, where applicable. The EIS will provide a summary of discussions, indicate the methods used and their relevance, locations, the persons and organizations consulted, the concerns raised, the extent to which this information was incorporated in the design of the project as well as in the EIS, and the resultant changes. The proponent will also provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process.

11.4 Follow-Up Program

A follow-up program is intended to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the project. The EIS will describe the proposed follow-up program in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), and to confirm both the assumptions and the effectiveness of mitigation. The follow-up program will include specific commitments that clearly describe how the proponent intends to implement them.

The follow-up program will be designed to incorporate baseline data, compliance data (such as established benchmarks, regulatory documents, standards or guidelines) and real time data (such as observed data gathered in the field). The proponent will describe the reporting methods to be used, including frequency, methods and format.

The effects predictions, assumptions and mitigation actions that are to be tested in the follow-up program must be converted into field-testable monitoring objectives. The monitoring design must include a statistical evaluation of the adequacy of existing baseline data to provide a benchmark against which to test for project effects, and the need for any additional pre-construction or pre-operational monitoring to establish a firmer project baseline.

The follow-up program will include a schedule indicating the frequency and duration of effects monitoring. This schedule is to be developed after an evaluation of the length of time needed to detect effects given estimated baseline variability, likely magnitude of environmental effect and desired level of statistical confidence in the results (Type 1 and Type 2 errors).

The description of the follow-up program will include any contingency procedures/plans or other adaptive management provisions as a means of addressing unforeseen effects or for correcting exceedances as required to comply or to conform to benchmarks, regulatory standards or guidelines.

The follow up program will also be designed to monitor the implementation of mitigation measures resulting from Aboriginal consultation, including:

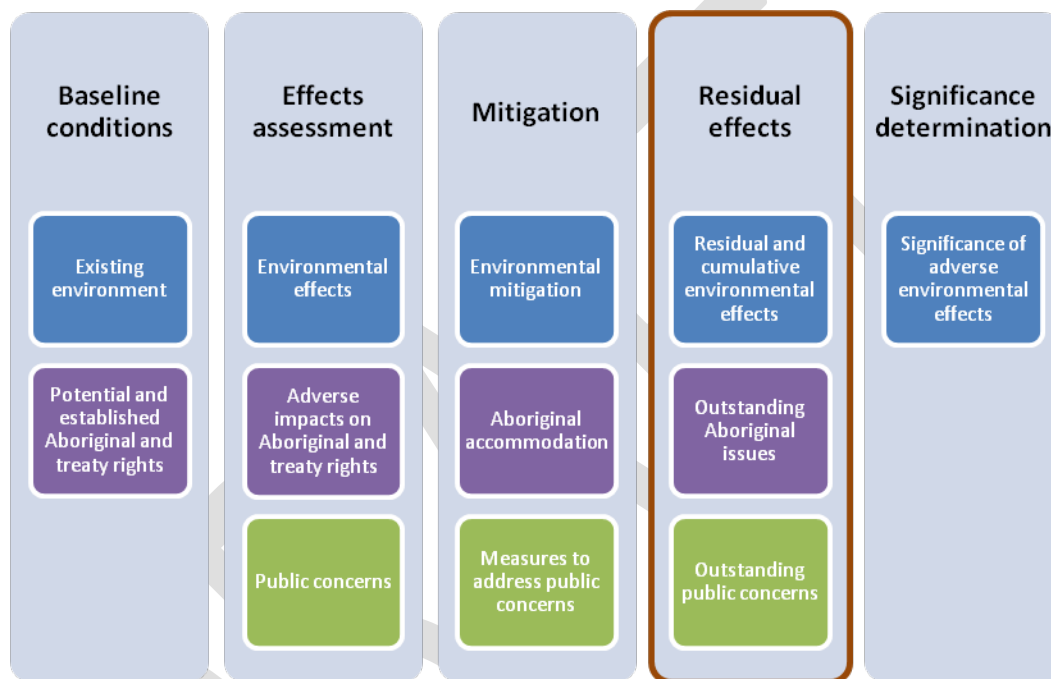
- Verifying predictions of environmental effects with respect to Aboriginal peoples, as well as residual impacts that could not be addressed within the context of the EA;
- Determining the effectiveness of mitigation measures as they relate to environmental effects with respect to Aboriginal peoples in order to modify or implement new measures where required;
- Supporting the implementation of adaptive management measures to address previously unanticipated adverse environmental effects with respect to Aboriginal peoples or unanticipated adverse impacts to Aboriginal rights;
- Verifying measures identified to prevent and mitigate potential adverse effects of the project on potential or established Aboriginal and Treaty rights; and
- Providing information that can be used to improve and/or support future EAs and Aboriginal consultation processes.

Where appropriate, the follow-up program can also encompass measures identified to address public concerns identified in section 11.3.

11.5 Proponent commitments

Proponent commitments identified in the EIS, including environmental mitigation measures to address public and Aboriginal peoples concern, and follow-up program elements, may be considered for inclusion as conditions in the EA decision statement and/or as part of other compliance and enforcement mechanisms. Each commitment will be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation.

12 RESIDUAL EFFECTS



12.1 Residual and cumulative environmental effects

12.1.1 Residual environmental effects

After having established the technically and economically feasible mitigation measures, the EIS will present any residual environmental effects of the project on the biophysical and human environments after these mitigation measures have been taken into account. The residual effects, even if very small or deemed insignificant will be described.

12.1.2 Cumulative environmental effects

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* and the guide entitled *Cumulative Effects Assessment Practitioners' Guide, 1999*⁵.

⁵ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/

Cumulative effects are defined as changes to the environment due to the project combined with the existence of other works or other past, present and reasonably foreseeable physical activities. Cumulative effects may result if:

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

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

In its EIS, the proponent will:

- Identify and justify the environmental components that will constitute the focus of the cumulative effects assessment, emphasizing this assessment on the VCs most likely to be affected by the project and other project and activities;
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments will generally be different for different VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects;
- identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEEA 2012.
- describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term;
- Determine the significance of the cumulative effects; and
- Develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.

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

12.1.3 Summary of residual environmental effects

In addition, the EIS will summarise the residual environmental effects (including cumulative environmental effects) identified in relation to the categories of environmental effects specified in sections 10.1.2 and 10.1.3:

- Changes to components of the environment within federal jurisdiction;
- Changes to the environment that would occur on federal or trans-boundary lands;
- Changes to the environment that are directly linked or necessarily incidental to federal decisions;
- Effects of changes to the environment on Aboriginal peoples; and
- Effects of changes to the environment that are directly linked or necessarily incidental to federal decisions.

12.2 Outstanding Aboriginal issues

This section will describe, from the perspective of the proponent, the potential adverse impacts on potential or established Aboriginal and Treaty rights and related interests that have not been fully mitigated as part of the environmental assessment and associated consultations with Aboriginal groups. This includes potential adverse impacts (on potential or established Aboriginal and Treaty rights and related interests) that may result from the residual and cumulative environmental effects described in section 10.2.

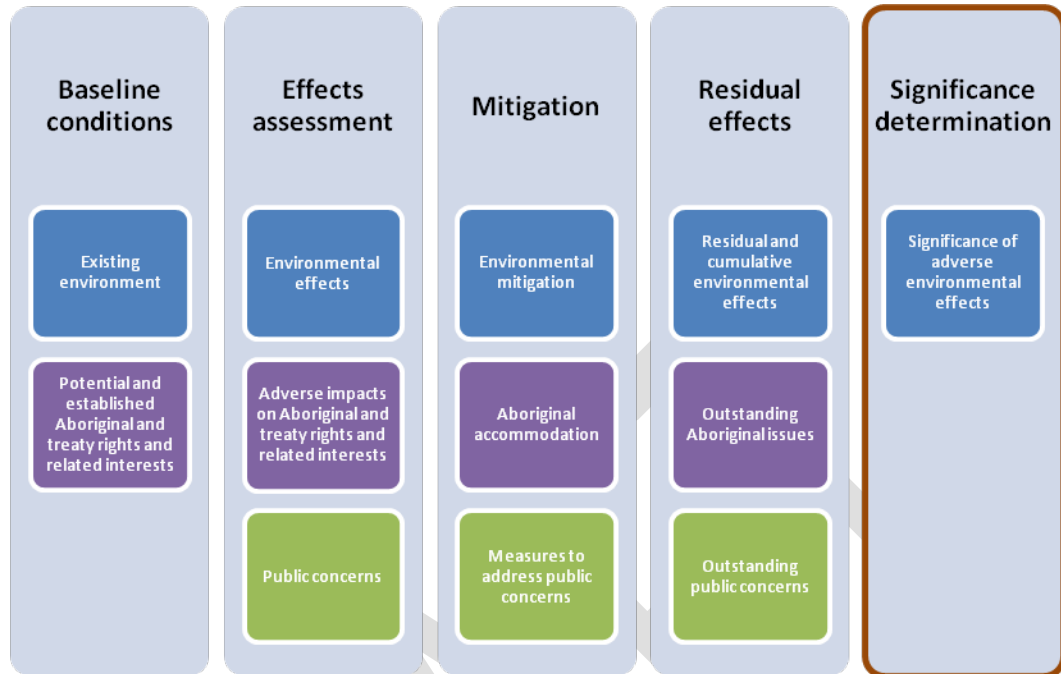
The information in this section will assist the Crown in assessing the adequacy of consultation and accommodation as set out in the Updated Guidelines for Federal Officials to Fulfill the Duty to Consult (2011)⁶.

12.3 Outstanding public concerns

This section will describe the outstanding public concerns in relation to the project that have not been resolved as a result of changes to the project, mitigation measures, or public consultation.

⁶ Visit the Aboriginal Affairs and Northern Development Canada website at: www.aadnc-aandc.gc.ca/eng/1100100014680/1100100014681

13 SIGNIFICANCE DETERMINATION



13.1 Significance of adverse environmental effects

13.1.1 Methodology

This section will provide a detailed analysis of the significance of the residual environmental effects (including cumulative environmental effects) that are considered adverse, using the approach described in the Agency's Reference Guide Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects⁷.

The EIS will identify the criteria used to assign significance ratings to any predicted adverse effects. It will contain clear and sufficient information to enable the Agency, technical and regulatory agencies, Aboriginal groups and the public to review the proponent's analysis of the significance of effects. The proponent will define the terms used to describe the level of significance.

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

- Magnitude;
- Geographic extent;
- Duration and frequency;
- Reversibility;
- Ecological and social context; and
- Existence of environmental standards, guidelines or objectives for assessing the impact.

⁷ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/default.asp?lang=En&n=D213D286-1&offset=&toc=hide

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

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

13.1.2 Summary of significant adverse environmental effects

In addition, the EIS will summarise the significant adverse environmental effects identified in relation to the categories of environmental effects specified in sections 10.1.2 and 10.1.3:

- Changes to components of the environment within federal jurisdiction;
- Changes to the environment that would occur on federal or trans-boundary lands;
- Changes to the environment that are directly linked or necessarily incidental to federal decisions;
- Effects of changes to the environment on Aboriginal peoples; and
- Effects of changes to the environment that are directly linked or necessarily incidental to federal decisions.

14 SUMMARY TABLES

The EIS will contain tables summarising the following key information:

- Potential environmental effects (section 10.1), adverse impacts on potential or established Aboriginal and Treaty rights and related interests (section 10.2) and public concerns (section 10.3);
- Proposed mitigation measures and commitments (section 11.5) by proponent to address potential impacts on environment, (section 11.1), Aboriginal rights (section 11.2) and public concerns (section 11.3), and Follow-up Program (section 11.4);
- Potential residual and cumulative environmental effects (section 12.1) and the significance of the residual environmental effects (section 13.1) ; outstanding Aboriginal issues (section 12.2) and outstanding public concerns (section 12.3);
- Comments from the public and responses;
- Comments from Aboriginal groups and individuals and responses; and
- Relationship of the identified Valued Components (section 7.1.1) to Aboriginal groups' potential or established Aboriginal and Treaty rights and related interests (section 9.2).

The summary tables will be used in the EA Report prepared by the Agency. Proponent commitments may be considered for inclusion as conditions in the EA decision statement and/or as part of other compliance and enforcement mechanisms.

15 BENEFITS TO CANADIANS

15.1 Changes to the project since initially proposed

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

15.2 Benefits of the project

The EIS will include a section describing the predicted environmental, economic and social benefits of the project. This information will be considered in assessing the justifiability of the significant adverse environmental effects, if necessary.

16 MONITORING PROGRAM AND ENVIRONMENTAL MANAGEMENT PLANS

The goal of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. In the EIS, the proponent will describe the monitoring activities at all stages of the project, the proponent's proposed commitment to implementing these activities and the resources provided for this purpose. The program will need to provide the key information such as contacts, protocols, measured parameters, deadlines, intervention in case of non-compliance of legal requirements and production of monitoring reports.

The finalization of a detailed monitoring program will occur through consultation with federal and provincial government agencies, Aboriginal groups, the public and other stakeholders. This may occur after the environmental assessment but will be consistent with the information presented in the EIS. Pertinent legislation, regulations, industry standards, documents and legislative guides will be used in the development of the monitoring program.

Environmental management plans (EMPs) are an example of a tool that can be used to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. The EMPs will serve to provide guidance on specific actions and activities that will be implemented to decrease the potential for environmental degradation during construction and operation, and to clearly define the proponent's ongoing environmental commitment.