



PRODIGY
GOLD INCORPORATED

Magino Gold Project

MAGINO GOLD PROJECT

Finan Township, Algoma District, Ontario

ENVIRONMENTAL IMPACT STATEMENT APPENDIX 1: EIS GUIDELINES

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GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

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

Magino Gold Project

Prodigy Gold Incorporated

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Table of Contents

PART 1 - BACKGROUND	1
1 INTRODUCTION	1
2 GUIDING PRINCIPLES	1
2.1 Environmental assessment as a planning tool	1
2.2 Public participation.....	1
2.3 Aboriginal engagement	2
2.4 Application of the precautionary approach	2
3 Scope of the Environmental Assessment.....	2
3.1 Scope of the project	2
3.2 Factors to be considered	3
3.3 Scope of factors	3
4 Preparation and Presentation of the Environmental Impact Statement.....	5
4.1 Guidance	5
4.2 Study strategy and methodology	5
4.3 Use of information.....	8
4.4 Presentation and organization of the Environmental Impact Statement.....	9
4.5 Summary of the Environmental Impact Statement.....	9
PART 2 – CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT	11
1 INTRODUCTION AND OVERVIEW.....	11
1.1 The proponent.....	11
1.2 Project Overview.....	11
1.3 Project Location	11
1.4 Regulatory framework and the role of government	11
2 PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED	12
2.1 Purpose of the project.....	12
2.2 Alternative means of carrying out the project.....	12
3 PROJECT DESCRIPTION	15
3.1 Project components	15
3.2 Project activities	15
4 PUBLIC CONSULTATION AND CONCERNS	17
5 ABORIGINAL ENGAGEMENT AND CONCERNS	17
6 PROJECT EFFECTS ASSESSMENT	19
6.1 Project setting and baseline conditions.....	19
6.2 Effects to be considered	25
6.3 Mitigation.....	29
6.4 Significance of residual effects.....	30
7 CUMULATIVE EFFECTS ASSESSMENT	31

8 SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT	32
9 FOLLOW-UP AND MONITORING PROGRAMS	32
9.1 Follow-up Program.....	32
9.2 Monitoring	33

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, 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.

Abbreviations and Short Forms

CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
Agency	Canadian Environmental Assessment Agency
EA	environmental assessment
EIS	environmental impact statement
VC	valued component

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. Part 1 of this document defines the scope of the environmental assessment and provides guidance and general instruction on the preparation of the EIS. Part 2 of the document outline the information that must be included in the EIS.

CEAA 2012 requires an assessment of the potential adverse effects of a proposed project on areas of federal jurisdiction as identified in section 5 of this Act. The Canadian Environmental Assessment Agency (the Agency) will use the proponent's EIS to prepare an EA Report that focuses on the potential for the project to cause adverse effects on areas of federal jurisdiction. Therefore the EIS must include a full description of the changes the project will cause to the environment including changes that are directly linked or necessarily incidental to any federal decisions that would permit the project to be carried out. It is the responsibility of the proponent to provide sufficient data and analysis on any potential changes to the environment to ensure a thorough evaluation of the environmental effects of the project by 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.

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. CEAA 2012 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.

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

2.3 Aboriginal engagement

One of the purposes of CEAA, 2012 is to promote communication and cooperation with Aboriginal peoples which includes, First Nations, Inuit and Métis. In gathering and assessing the information required for the EIS, the proponent will ensure that it engages with Aboriginal groups that may be affected by the project, as early as possible in the project planning process. The proponent will provide Aboriginal groups with opportunities to learn about the projects and its potential effects make their concerns known about the project's potential effects and discuss measures to mitigate effects. The proponent is strongly encouraged to work with Aboriginal groups in establishing an engagement approach. In addition, the proponent will provide potentially affected Aboriginal groups with timely access to relevant information that allows them to understand the proposed project and to determine its effects on their community, activities and other interests. The proponent will make reasonable efforts to integrate traditional Aboriginal knowledge into the assessment of environmental impacts.

Information gathered through the EA process and associated engagement by the proponent with Aboriginal groups will be used to inform decisions under CEAA 2012. This will be done without breaking obligations of confidentiality, if any (see section 4.3.2 for further information on this subject). This information will also contribute to 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.

2.4 Application of the 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 it 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. The proponent will also ensure that in designing and operating the project, priority has been and would be given to strategies that avoid adverse effects.

3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

3.1 Scope of the project

On July 8, 2013, *Prodigy Gold Incorporated*, a wholly-owned subsidiary of *Argonaut Gold Incorporated*, the proponent of the *Magino Gold* project (the project) provided a project description to the Agency. Based on this project description, the Agency has determined that the scope of project for the purposes of this environmental assessment will include the construction, operation, decommissioning and abandonment of the following project components:

- Open pit
- Tailings impoundment area(s) (TIAs)
- Waste rock storage
- Stockpile (s) (low-grade ore, medium grade ore, ore, overburden, PAG)
- Mill/ore processing plant
- Explosives plant and magazine
- Aggregate extraction

- Water management facilities (potable and process)
- By-pass road
- On-site accommodations (camp)
- Domestic waste storage;
- Ancillary infrastructure (security, parking areas, mine truck and vehicle maintenance shops, administrative offices, warehouses, laboratories, and vehicle fuelling and maintenance facilities).

3.2 Factors to be considered

Scoping establishes the boundaries of the EA and focuses the assessment on relevant issues and concerns. Part 2 of this document specify the factors to be considered in this environmental assessment and include the factors listed in subsection 19(1) of CEAA 2012:

- environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other physical activities that have been or will be carried out;
- the significance of effects;
- comments from the public;
- mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- the requirements of the follow-up program in respect of the project;
- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternatives;
- any change to the project that may be caused by the environment; and
- the results of any relevant regional study pursuant to CEAA 2012.

3.3 Scope of factors

3.3.1 Valued components to be examined

Valued components (VCs) refer to environmental biophysical or human features that may be affected by a project and that have been identified to be of concern by the proponent, government agencies, Aboriginal groups or the public. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. For example, it may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

The proponent will identify the valued components (VCs) deemed appropriate, including the ones identified in Part 2 (section 6.2) of this document. The VCs identified in these guidelines include, but are not limited to, the relevant environmental components specified by section 5 of CEAA 2012, as well as species at risk and their critical habitat as per the requirement outlined in section 79 of the *Species at Risk Act*. Section 5 of CEAA 2012 defines environmental effects for the application of the Act as:

- A change that may be caused to fish and fish habitat, marine plant and migratory birds;
- A change that may be caused to the environment on federal lands, in another province or outside Canada;
- With respect to aboriginal peoples, an effect of any change caused to the environment on:
 - ✓ health and socio-economic conditions;
 - ✓ physical and cultural heritage;
 - ✓ the current use of lands and resources for traditional purposes;

- ✓ any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
- For project requiring a federal authority to exercise a power or function under another Act of Parliament;
 - ✓ a change, other than the ones mentioned above, that may be caused to the environment and that is directly linked or necessarily incidental to the exercise of the federal power or function.
 - ✓ the effect of that change, other than the ones mentioned above, on:
 - health and socio-economic conditions;
 - physical and cultural heritage;
 - any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The final list of VCs 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 consultation and Aboriginal engagement. The proponent will describe 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 proponent will provide a rationale for selecting specific VCs and for excluding any VCs or information specified in these guidelines. Challenges may arise regarding particular exclusions, so it is important to document the information and the criteria used to make each determination. Examples of justification include primary data collection, computer modelling, literature references, public consultation, expert input or professional judgement. 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 environmental, Aboriginal, social, economic, recreational, and aesthetic considerations. If comments are received on a component that has not been included as a VC, these comments will be summarised.

3.3.2 Spatial and Temporal boundaries

The spatial and temporal boundaries used in the EA may vary depending on the VC. 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 comments when defining the spatial boundaries used in the EIS.

The EIS will clearly indicate the spatial boundaries to be used in assessing the potential adverse environmental effects of the project and provide a rationale for each boundary. Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential environmental effects, community and Aboriginal traditional knowledge, current land and resource use by Aboriginal groups, ecological, technical and social and cultural considerations.

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

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

4 PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1 Guidance

The proponent is encouraged to consult relevant Agency Policy and Guidance² on topics to be addressed in the EIS. The proponent is further encouraged to consult with the Agency during the planning and development of the EIS materials.

In planning for a mine proposal and in developing the EIS and technical support documentation, the proponent is advised to consider the “Environmental Code of Practice for Metal Mines”³, published by Environment Canada in 2009. The recommended practices in the Code include the development and implementation of environmental management tools, the management of wastewater and mining wastes, and the prevention and control of environmental releases to air, water and land. In addition, the parameters and approach of the Environmental Effects Monitoring program under the *Metal Mining Effluent Regulations* (MMER) should be considered when developing a baseline monitoring program for the aquatic environment.

For projects requiring the use of natural water bodies frequented by fish for the disposal of mine waste, including tailings and waste rock, and for the management of process water, the MMER would need to be amended to add the affected water bodies to Schedule 2 to designate them as tailings impoundment areas. This regulatory process will not be initiated until a detailed assessment of alternatives for mine waste disposal has been undertaken by the proponent. Conducting this robust and thorough assessment of alternatives during the EA stage will streamline the overall regulatory review process and minimize the time required to proceed with the MMER amendment process. It also facilitates a thorough and transparent review of the assessment of alternatives as part of the EA process. For further guidance, the proponent should consult Environment Canada’s Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2011).

In the event that the proponent chooses not to conduct an assessment of alternatives for mine waste during the EA stage pursuant to the MMER requirements, the EA under CEAA 2012 will continue. In these circumstances, the proponent should discuss with Environment Canada how the information requirements and consultation associated with the MMER amendment process can be addressed through other means.

Visit the Canadian Environmental Assessment Agency website: ² www.ceaa-acee.gc.ca/default.asp?lang=En&n=F1F30EEF-1
Visit Environment Canada’s website at: ³ www.ec.gc.ca/lcpe-epa/default.asp?lang=En&n=CBE3CD59-1

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 encouraged to submit it concurrent with the EIS.

4.2 Study strategy and methodology

The proponent is expected to respect the intent of these guidelines and to consider the effects that are likely to 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. 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 as long as they are justifiable and replicable.

It is possible these guidelines may include matters which, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, the proponent will clearly indicate it, and provide a justification so the Agency, federal authorities, Aboriginal groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency disagrees with the proponent's decision, it may require the proponent to provide the specified information

The assessment will include the following general steps:

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

For each VC, the proponent will describe the methodology used to assess project-related effects. 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.

The EIS will include a description of the environment (both biophysical and human), including the components of the existing environment and environmental processes, their interrelations as well as the variability in these components, processes and interactions over time scales appropriate to the 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 or may be integrated into clearly defined sections within the effects assessment of each VC. This analysis will include environmental conditions resulting from historical and present activities in the local and regional study area.

In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent will identify and justify the

indicators and measures of ecosystem health and integrity used for analysis and relate these to the identified VCs. 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 for an identified VC, 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 and terrestrial vegetation types and species (e.g. ecological land classification mapping). Habitat use will be characterized by type of use (e.g. spawning, breeding, migration, feeding, nursery, rearing, wintering), frequency and duration. 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. 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.

In describing and assessing effects related to Aboriginal peoples, the proponent will consider the use of both primary and secondary sources of information regarding changes to the environment and the corresponding effect on health, socio-economics, physical and cultural heritage or current use of lands and resources for traditional purposes. Primary sources of information include traditional land use studies, socio-economic studies, heritage surveys or other relevant studies conducted specifically for the project and its EIS. Secondary sources of information include previously documented information on the area, not collected specifically for the purposes of the project. The proponent needs to provide Aboriginal groups the opportunity to review and provide comments on the information used for describing and assessing effects on Aboriginal peoples (further information on engaging with Aboriginal groups is provided in Part 2, Section 5 of this document). Where there are discrepancies in the views of the proponent and Aboriginal groups on the information to be used in the EIS, the proponent will document these discrepancies and the rationale for the proponent's selection of information.

Assessment of effects on Aboriginal peoples will consider interactions with biophysical environment VCs. When relating an effect on Aboriginal peoples to an effect or lack thereof for a biophysical component, careful consideration should be given to whether there are different thresholds for effects on 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.

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.

4.3 Use of information

4.3.1 Scientific advice

Section 20 of CEAA 2012 requires that every federal authority with specialist or expert information or knowledge with respect to a project subject to an 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.

4.3.2 Community knowledge and Aboriginal traditional knowledge

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

The proponent will incorporate into the 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.

4.3.3 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 was 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.

4.3.4 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 environmental assessment are included in the Canadian Environmental Assessment Registry 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,
- may cause harm to a person or harm to the environment through its disclosure.

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

4.4 Presentation and organization of the Environmental Impact Statement

To facilitate the identification of the documents submitted and their placement in the Canadian Environmental Assessment Registry, the title page of the 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. The exception to this preference is the cumulative effects assessment, which should be provided in a stand-alone section. Detailed studies (including all relevant and supporting data and methodologies) will be provided in separate appendices and will be referenced by appendix, section and page in the text of the main document. The 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. 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 format, as directed by the Agency.

4.5 Summary of the 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. Alternative means of carrying out the project
4. Public consultation
5. Aboriginal engagement
6. Summary of environmental effects assessment for each VCs, including:
 - a. description of the baseline
 - b. anticipated effects
 - c. mitigation measures
 - d. significance of residual effects
7. Follow-up and monitoring programs proposed

The summary will have sufficient details for the reader to learn and understand the project, potential impacts, mitigation measures proposed, and the significance of the residual effects. The summary will include key maps illustrating the project location and key project components.

PART 2 – CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

1 INTRODUCTION AND OVERVIEW

1.1 The proponent

The proponent will:

- provide its 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;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and,
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.

1.2 Project Overview

The proponent will briefly summarize the project, by presenting key project components and associated activities, scheduling details, the timing of each phase of the project and other key features. If the project is a part of a larger sequence of projects, the proponent will outline the larger context.

The intent of this overview is to provide the key components of the project, rather than a detailed description, which will follow in Section 3 of this document.

1.3 Project Location

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 following information will be included:

- the UTM coordinates of the main project site;
- 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, wetlands, estuaries, and habitats of federally or provincially listed species at risk and other sensitive areas;
- local and Aboriginal communities; and,
- traditional Aboriginal territories, treaty lands, Indian reserve lands.

1.4 Regulatory framework and the role of government

The EIS will 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 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.

2 PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED

2.1 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 the 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.

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

2.2 Alternative means of carrying out the project

The Agency recognizes that projects may be in the early planning stages when the EIS is being prepared. In many cases, proponents have not made final decisions concerning the placement of project infrastructure, the technologies to be employed, or that several options may exist for various project components. In these situations, project proponents are strongly encouraged to describe the various options available (alternative means) within the EIS. 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 technically and economically feasible 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.
- 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, at a minimum, the following project components:

- location of key project components;
- energy sources to power the project site;
- Water management facilities (potable and process) and general site drainage works; and,
- mine waste disposal (methods and sites considered)⁴.

⁴ Should an MMER Schedule 2 amendment be required for the project, the proponent is strongly encouraged to include MMER requirements for an assessment of alternatives for mine waste disposal in the EIS. The methodology recommended for the conduct of mine waste disposal alternatives is described in Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2011). A copy of this guide can be found on Environment Canada's website at www.publications.gc.ca/site/eng/345934/publication.htm. Proponent should also refer to Part 1, section 4.1 of this document.

3 PROJECT DESCRIPTION

3.1 Project components

The proponent will describe the project, by presenting the project components, associated and ancillary works, and other characteristics that will assist in understanding the environmental effects.

This will include:

- maps, at an appropriate scale, of the project location, the project components, boundaries of the proposed site with UTM coordinates, the major existing infrastructure, adjacent land uses and any important environmental features;
- tailings management facility (footprint, location and preliminary designs);
- waste rock, overburden, topsoil, low grade ore storage and stock piles (footprint, locations, volumes, development plans and design criteria);
- open pit and (footprint, location, development plans including pit phases);
- crusher, and processing facilities (footprint, technology, location);
- water management infrastructure including, water management facilities proposed to control, collect and discharge surface drainage and groundwater seepage to the receiving environment from all key components of the mine infrastructure (e.g. pit water and/or underground mine water, mine effluent);
- permanent and temporary linear infrastructures (road, railroad, pipelines, power supply), identifying the route of each of these linear infrastructures, the location and types of structure used for stream crossings;
- drinking and industrial water requirements (source, quantity required, need for water treatment);
- energy supply (source, quantity); and
- waste disposal (type of waste, method of disposal, quantity).

3.2 Project activities

The EIS will include descriptions of the construction, operation, decommissioning and abandonment associated with the proposed project.

This will include 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 should be provided, the emphasis will be on activities with the greatest potential to have environmental effects. Sufficient information will be included to predict environmental effects and address public concerns identified. Highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment.

The 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.

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

The information will include a description of:

3.2.1 Site preparation and construction

- site clearing, excavation;
- blasting (frequency and methods, type of explosive used);
- borrow materials requirements (source and quantity);
- water diversion required (location, methods, timing);
- equipment requirements (type, quantity);
- administrative buildings, garages, other ancillary facilities;
- construction camp (location, capacity, wastewater treatment; and,
- number of employees and transportation of employees.

3.2.2 Operation

- mining plan, ore production, ore stockpiling, concentrate production;
- equipment requirements;
- explosive uses (storage location and management);
- blasting (frequency and methods);
- water management on the project site, including a detailed water budget;
- ore crushing and treatment;
- reagent requirements (volumes, storage, types);
- petroleum products (source, volume, storage);
- characterization and management of ore, waste rock, low grade ore, overburden and tailings (volumes generated, mineralogical characterization, potential for metal leaching and acid rock drainage);
- effluent management and treatment (quantity, treatment requirement, release point);
- contribution to atmospheric emissions, including emissions profile (type, rate and source)
- water recycling;
- waste management and recycling (other than mine waste such as tailings and waste rock);and,
- number of employees, transportation of employees, work schedule, lodging requirement on site and off site.

3.2.3 Decommissioning and abandonment

- the preliminary outline of a decommissioning and reclamation plan for any components associated with the project;
- the ownership, transfer and control of the different project components;
- the responsibility for monitoring and maintaining the integrity of the remaining structures;and,
- for permanent facilities, a conceptual discussion on how decommissioning could occur.

4 PUBLIC CONSULTATION AND CONCERNS

The proponent shall describe the ongoing and proposed consultations and the information sessions that it will hold or that it has already held in the context of the project at the local, regional and provincial levels, where applicable. It will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. The proponent will also 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 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.

The proponent will also describe any outstanding issues and describe ways to address these outstanding issues. The proponent will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process.

5 ABORIGINAL ENGAGEMENT AND CONCERNS

For the purposes of developing the EIS, the proponent will engage with Aboriginal groups that may be affected by the project, as it relates to:

- Effects of changes to the environment on Aboriginal peoples (health and socio-economic issues; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and current use of lands and resources for traditional purposes), and,
- Potential adverse impacts of the project on potential or established Aboriginal or Treaty rights.

With respect to the above matters and in addition to information requirements outlined in Part 2 of these guidelines, in the EIS, the proponent will document:

- VCs suggested by Aboriginal groups for inclusion in the EIS, whether or not those factors were included, and the rationale for any exclusions;
- 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;
- based on its own perspective, the potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established Aboriginal or Treaty rights.
- This assessment is to 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;
- the measures identified to mitigate potential adverse impacts of the project on the potential or established Aboriginal or Treaty rights. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them;
- specific suggestions raised by Aboriginal groups for mitigating the effects of changes to the environment on Aboriginal peoples or potential adverse impacts of the project on potential or established Aboriginal and Treaty rights;

- views expressed by Aboriginal groups on the effectiveness of the mitigation measures;
- any potential cultural, social and/or economic impacts or benefits to Aboriginal groups that may arise as a result of the project;
- comments, specific issues and concerns raised by Aboriginal groups and how the key concerns were responded to or addressed;
- changes made to the project design and implementation directly as a result of discussions with
 - Aboriginal groups;
 - where and how Aboriginal traditional knowledge was incorporated into the consideration of effects of changes to the environment on Aboriginal peoples, potential adverse impacts on potential or established Aboriginal or Treaty rights and related mitigation measures;
 - the effects of changes to the environment on Aboriginal peoples or potential adverse impacts on potential or established Aboriginal or Treaty rights that have not been fully mitigated as part of the environmental assessment and associated engagement with Aboriginal groups, including the potential adverse effects that may result from the residual and cumulative environmental effects; and,
 - any additional issues and concerns raised by Aboriginal groups in relation to the effects of changes to the environment on Aboriginal peoples and the potential adverse impacts of the project on potential or established Aboriginal and Treaty rights and mitigation measures.

Information provided in the EIS related to potential adverse impacts on potential or established Aboriginal or Treaty rights 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)⁵.

Aboriginal Groups to Engage & Engagement Activities

With respect to engagement activities, the EIS will document:

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

In preparing the EIS, the proponent will ensure that Aboriginal groups have access to timely and relevant information that they require in respect of the project and how the project may adversely impact them. The proponent will structure its Aboriginal engagement activities to provide adequate time for Aboriginal groups to review and comment on the relevant information. Engagement activities must be appropriate to the groups' needs and should be arranged through discussions with the groups. The proponent will describe all efforts, successful or not, taken to solicit the information required from Aboriginal groups in the preparation of the EIS.

⁵ Visit the Aboriginal Affairs and Northern Development Canada website at:
www.aadnc-aandc.gc.ca/eng/1100100014680/1100100014681

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

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

- Michipicoten First Nation;
- Pic Mobert First Nation;
- Missanabie Cree First Nation;
- Métis Nation of Ontario; and,
- Red Sky Métis Independent Nation.

For the above groups, the proponent will ensure there are sufficient opportunities for individuals and groups to provide oral input in the language of their choice. The proponent will ensure that these Aboriginal groups' views are heard and recorded.

The groups referenced above may change as more is understood about the environmental effects of the project and/or if the project or its components change location or alignment during the EA. The Agency reserves the right to alter the list of Aboriginal groups that the proponent will engage as additional information is gained about the project.

Should the proponent have knowledge of potential effects to an Aboriginal group not listed above, he will bring this to the attention of the Agency at the earliest opportunity.

6 PROJECT EFFECTS ASSESSMENT

6.1 Project setting and baseline conditions

Based on the scope of project described in section 3 (Part 1), the proponent will present baseline information in sufficient detail to facilitate the identification and a good understanding of how the project could affect the various valued components (VCs). Should other VCs be identified during the conduct of the EA, the baseline condition for these components will also be described in the EIS. To determine the appropriate spatial boundaries to describe the following baseline information, refer to section 2.3.2 (Part 1). As a minimum, the EIS will include a description of:

6.1.1 Air quality, noise and climate

- ambient air quality in the project areas and, for the mine site, the results of a baseline survey of ambient air quality, including the following contaminants: total suspended particulates, PM_{2.5}, PM-10, SO_x, VOCs and NO_x;
- current ambient noise levels at key receptor points (e.g. aboriginal communities, cabins), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included;

- existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons; and,
- historical records of total precipitation (rain and snow), mean, max and min temperatures.

6.1.2 Geology and geochemistry

- the bedrock and host rock geology of the deposit, including a table of geologic descriptions, geological maps and cross-sections of appropriate scale;
- geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
- the geochemical characterization of expected mine material such as waste rock, ore, low grade ore, tailings, overburden and potential construction material in order to predict metal leaching and acid rock drainage⁶; and,
- geological hazards that exist in the areas planned for the project facilities and infrastructure, including:
 - ✓ history of seismic activity in the area;
 - ✓ isostatic rise or subsidence; and,
 - ✓ landslides, slope erosion and the potential for ground and rock instability, and subsidence following project activities.

6.1.3 Topography and soil

- baseline mapping and description of landforms and soils within the local and regional project area;
- maps depicting soil depth by horizon and soil order within the mine site area to support soil salvage and reclamation efforts, and to outline potential for soil erosion;
- sedimentological and geochemical characteristics of surficial sedimentary units and soils;
- suitability of topsoil and overburden for use in the rehabilitation of disturbed areas; and,
- data on the concentration of trace elements in site soils prior to project development.

6.1.4 Groundwater

- the hydrogeology, including:
 - ✓ the hydrogeological context (e.g., hydrostratigraphy with aquifers and aquitards, major faults, etc.) including the delineation of key stratigraphic and hydrogeologic boundaries;
 - ✓ the physical properties of the hydrogeological units (e.g., hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield);
 - ✓ the groundwater flow patterns and rates;

⁶ The manual produced by the Mine Environment Neutral Drainage (MEND) Program, entitled, MEND Report 1.20.1, "Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials", Version 0 - December 2009 is a recommended reference for use in acid rock drainage and metal leaching prediction.

- ✓ a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow;
 - ✓ temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels); and,
 - ✓ a delineation and characterization of groundwater surface water interactions including the locations of groundwater discharge to surface water and surface water recharge to groundwater.
- hydrogeological maps and cross-sections for the mine area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells, groundwater types springs, surface waters, and project facilities. Groundwater levels, potentiometric contours, flow directions, groundwater divides and areas of recharge and discharge should be included;
 - all groundwater monitoring wells, including their location, in respect to the project area, including geologic, hydrostratigraphic, piezometric and construction data (e.g., depths of surficial and bedrock units, water level, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit);
 - monitoring protocol for collection of existing groundwater data;
 - an appropriate hydrogeologic model for the project area, which discusses the hydrostratigraphy and groundwater flow systems; a sensitivity analysis will be performed to test model sensitivity to climatic variations (e.g., recharge) and hydrogeologic parameters (e.g., hydraulic conductivity);
 - graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality;
 - local and regional potable groundwater supplies, including their current use and potential for future use; and,
 - bedrock fracture sizes and orientations in relation to groundwater flow.

6.1.5 Surface water and sediment

- the delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components;
- hydrological regimes, including monthly, seasonal and annual water flow (discharge) data;
- for each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments);
- seasonal water quality field and lab analytical results (e.g. water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation at several representative local stream and water body monitoring stations established at the project site;
- any local and regional potable surface water resource; and,
- sediment quality analysis for key sites likely to receive mine effluents.

6.1.6 Fish and fish habitat

For potentially affected surface waters:

- a characterization of fish populations on the basis of species and life stage, including information on the surveys carried out and the source of data available (e.g. location of sampling stations, catch methods, date of catches, species);
- a list of any rare fish or invertebrate species that are known to be present;
- a description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos;
- a description of natural obstacles (e.g. falls, beaver dams) or existing structures (e.g. water crossings) that hinder the free passage of fish;
- maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, nursery, feeding, overwintering, migration routes, etc. This information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone; and,
- the description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area.

Note that certain intermittent streams or wetlands may constitute fish habitat or contribute indirectly to fish habitat. The absence of fish at the time of the survey does not irrefutably indicate an absence of fish habitat.

6.1.7 Birds, wildlife and their habitat⁷

- the various ecosystems found in the project area likely to be affected based on existing information;
- migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other land birds);
- year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources;
- areas of concentration of migratory animals, such as breeding, denning and/or wintering areas;
- ungulates, furbearers, amphibians, small mammals, and their habitat;
- existing or proposed protected areas, special management areas, and conservation areas in the regional study area;
- wetlands most likely to be affected by project activities according to their location, size, type (wetland class and form), species composition and ecological function (Canadian Wetland Classification System, National Wetlands Working Group, 1997);
- key plant communities and animals that rely on wetlands;
- submerged floating and emergent aquatic vegetation;
- all species at risk that may be affected by the project, (flora and fauna), including species listed under the *Species at Risk Act* or other provincial endangered species legislation, and critical habitat that may be affected by the project, using existing data and literature as well as surveys to provide current field data, as appropriate;

⁷ 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.

- any published studies that describe the regional importance, abundance and distribution of species at risk; and,
- residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.

6.1.8 Human environment

Note: the description of the human environment for Aboriginal peoples is covered more specifically in the following subsection.

- the rural and urban settings likely to be affected by the project;
- any federal lands, lands located outside the province or Canada that may be affected by the project;
- the current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters;
- current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available;
- location of and proximity of any permanent, seasonal or temporary residences or camps;
- health⁸ and socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities; and,
- physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

6.1.9 Aboriginal peoples

With respect to Aboriginal peoples,

- drinking water sources (permanent and seasonal, periodic, or temporary);
- reliance on country foods;
- any other relevant exposure pathways that could affect the health;
- general social and economic conditions of the community/Aboriginal group;
- location of reserves and communities;
- commercial harvesting activities (e.g. fishing, trapping, hunting, forestry, outfitting);
- recreational uses of the project area;
- all traditional uses currently practiced that could be affected by the project;

⁸ The proponent should refer to Health Canada's Useful Information for Environmental Assessments document in order to include the appropriate baseline information relevant to human health. This document can be obtained at <http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/eval/eval/eval/index-eng.php>

- places where fish, wildlife and plants are harvested;
- fish, wildlife and plants of importance for traditional use;
- access and travel routes for conducting traditional practices;
- location of hunting camps and cabins;
- location of traditional territory;
- ancillary benefits to the traditional practices including transfer of culture and language;
- physical and cultural heritage⁹ (including any site, structure or thing of archaeological, paleontological, historical or architectural significance); and
- culturally important sites, structures, objects and landscapes (e.g. burial sites, spiritual places).

With respect to potential effects on Aboriginal peoples and the related VCs, baseline information will be provided for each Aboriginal group identified in section 5. This information should include, but not be limited to, traditional territory maps/geographical extent, demographics, use of traditional languages and involvement in traditional activities. The EIS will also indicate how input from Aboriginal groups was used in establishing the baseline conditions related to health and socio-economics, physical and cultural heritage and current use of lands and resources for traditional purposes. Other information or factors of importance to Aboriginal groups should be reflected as necessary.

⁹ Heritage resources to be considered will include but not be limited to, physical objects (e.g. middens, culturally-modified trees, historic buildings), sites or places (e.g. burial sites, sacred sites, cultural landscapes) and attributes (e.g. language, beliefs).

6.2 Effects to be considered

The assessment will include a consideration of the potential project effects on VCs identified by the proponent, including:

6.2.1 Air quality, Noise and Climate

- effects on air quality at key receptor points;
- increase noise and disturbance for key receptors, including wildlife;
- effect on night-time light levels; and,
- the contribution to total provincial and national greenhouse gas emissions on an annual basis.

6.2.2 Water

- modification to turbidity, oxygen level, water temperature, ice regime, water quality;
- modifications to the hydrological and hydrometric conditions;
- changes to groundwater recharge/discharge areas and any changes to groundwater infiltration areas; and,
- a prediction of acid rock drainage and metal leaching potential link to the storage of waste rock, ore, low grade ore, tailings, overburden and potential construction material, including:
 - ✓ short term metal leaching properties;
 - ✓ longer term rates of acid generation (if any) and metal leaching;
 - ✓ estimates of the potential for mined materials (including waste rock, tailings and low grade ore) to be sources of acid rock drainage or metal leaching;
 - ✓ estimates of potential time to the onset of acid rock drainage or metal leaching;
 - ✓ quantity and quality of effluent from samples of tailings, waste rock, and ore;
 - ✓ quantity and quality of effluent to be released from the site into the receiving waters;
 - ✓ quality of humidity cell or column test liquid from acid rock testing;
 - ✓ sensitivity analysis to assess the effects of imperfect segregation of waste rock;
 - ✓ pit water chemistry during operation and decommissioning and abandonment (post-closure), and pit closure management measures (e.g. flooding). This will include geochemical modelling of pit water quality in the post-closure period; and
 - ✓ surface and seepage water quality from the waste rock dumps, tailings/waste rock impoundment facility, stockpiles and other infrastructure during operation and post-closure.

6.2.3 Fish and Fish Habitat

- the identification of any potential harmful alteration, disruption or destruction of fish habitat, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g. spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of:
 - ✓ the geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g. modification of substrates, dynamic imbalance, silting of spawning beds);
 - ✓ the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g. reproduction, fry-rearing, movements);
 - ✓ potential impacts on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat; and
 - ✓ any potential imbalances in the food web in relation to baseline;
- the effects of changes to the aquatic environment on fish and their habitat, including:
 - ✓ the anticipated changes in the composition and characteristics of the populations of various fish species, included shellfish and forage fish;
 - ✓ any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barrier);
 - ✓ any reduction in fish populations as a result of potential overfishing due to increased access to the project area; and,
 - ✓ any modifications and use of habitats by federally or provincially listed fish species.
- a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential impacts resulting from overlapping periods; and,
- a discussion of how vibration caused by blasting may affect fish behaviour, such as spawning or migrations.

6.2.4 Bird, Wildlife and their Habitat

- losses, structural changes, fragmentation of habitat and wetlands (cover types, ecological land unit in terms of quality, quantity, diversity, distribution and functions);
- where plant communities or ecological land unit classes are identified as rare, or where a significant percentage of a specific type may be removed by the project or fragmented by the disturbance footprint, describe the regional significance of those units and the anticipated effects;
- effects on parks, ecological reserves, management areas, conservancies, unique and sensitive ecological sites, wetlands, areas of concentrated use by wildlife, known and potential migration routes;
- any anticipated modification to bird and wildlife distribution, relative abundance, movements, habitat availability;
- direct bird or wildlife mortality that could be caused by clearing of sites or birds and wildlife being in contact with contaminated waters (e.g., tailing impoundment area);
- collision risk of migratory birds with any project infrastructures;

- indirect effects caused by increased disturbance (e.g. noise, light, presence of workers);
- an assessment of the potential to return the affected areas to pre-disturbance conditions and population levels; and,
- for each habitat unit, the potential effects of the project on provincially and federally listed species at risk (flora and fauna) and their critical habitat, including:
 - ✓ species listed by the Committee on the Status of Endangered Wildlife in Canada classification as endangered, threatened, or of special concern;
 - ✓ species listed on Schedule 1 of the federal *Species at Risk Act*, and,
 - ✓ provincially listed species.

6.2.5 Human Environment

Note: the project effects on Aboriginal peoples are covered more specifically in the following subsection.

- any effect resulting from increased traffic;
- any effects on land uses, including a description of how a modification to the access to the area may affect use of the project area;
- any effects of environmental changes on local socio-economics issues, including potential effects on:
 - ✓ the use of navigable waters;
 - ✓ forestry and logging operations;
 - ✓ hunting, trapping, and gathering activities;
 - ✓ commercial and recreational fisheries;
 - ✓ recreational use of the area by individuals and outfitters; and,
 - ✓ on the recreational interest and potential of the area, including a consideration of the modification made to the aesthetic value of the area;
- any effects on human health associated with air quality, potential contamination of country foods, drinking water quality, noise exposure and radiation exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health; and, any effects on the physical and cultural heritage, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

6.2.6 Effects of changes to the environment on Aboriginal peoples

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

- human health, considering potential decrease in air quality, potential contamination of country foods, drinking water quality, and noise exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health;
- socio-economic conditions, including but not limited to;

- ✓ the use of navigable waters;
- ✓ forestry and logging operations;
- ✓ commercial fishing, hunting, trapping, and gathering activities;
- ✓ commercial outfitters; and,
- ✓ recreational use.
- the current uses of land and resources for traditional purposes, including, but not limited to:
 - ✓ any effects on hunting, fishing, trapping, cultural and other traditional uses of the land (e.g. collection of medicinal plants, use of sacred sites), as well as related effects on lifestyle, culture and quality of life of Aboriginal groups;
 - ✓ any effects of alterations to access into the area on Aboriginal groups, including deactivation or reclamation of access roads;
 - ✓ how project construction timing correlates to the timing of traditional practices, and any potential impacts resulting from overlapping periods;
 - ✓ the regional significance of the traditional use of the project area and the anticipated effects to traditional practice of the Aboriginal group, including alienation of lands from Aboriginal traditional use;
 - ✓ indirect effects such as avoidance of the area by Aboriginal peoples due to increased disturbance (e.g. noise, presence of workers); and.
 - ✓ an assessment of the potential to return affected areas to pre-disturbance conditions to support traditional practices;
- physical and cultural heritages, and structure, site or thing of historical, archaeological, paleontological or architectural significance to Aboriginal groups, including, but not limited to:
 - ✓ the loss or destruction of physical and cultural heritage; and,
 - ✓ changes to access to physical and cultural heritage.

Other effects of importance to Aboriginal peoples should be reflected as necessary.

6.2.7 Effects of potential accidents or malfunctions

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

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

This assessment will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events.

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

6.2.8 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. flooding, drought, ice jams, landslides, avalanches, erosion, subsidence, fire, outflow conditions and 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 flood vs. 100-year flood). Longer-term effects of climate change will also be discussed up to the projected post-closure phase of the project. This discussion will include a description of climate data used.

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

6.3 Mitigation

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. Each measure will be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation. Mitigation measures may be considered for inclusion as conditions in the EA decision statement and/or as part of other compliance and enforcement mechanisms.

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 (including the measures directed at promoting beneficial or mitigating adverse socio-economic effects. 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 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 then describe mitigation measures that are specific to each environmental effect identified. Measures will be written as specific commitments that clearly describe how the proponent intends to implement them. 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 specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various phases to eliminate or reduce the significance of adverse effects. The impact statement will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit.

The EIS will indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation will be justified. The 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 requirements of the follow-up program.

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.

6.4 Significance of residual 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. The residual effects, even if very small or deemed insignificant will be described.

The EIS will then provide a detailed analysis of the significance of the residual environmental effects that are considered adverse, using guidance described in section 4 of the Agency's reference guide *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*¹⁰.

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

In assessing significance against these criteria the proponent will, where possible, use relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment. The

¹⁰ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/default.asp?lang=En&n=D213D286-1&offset=&toc=hide

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.

7 CUMULATIVE EFFECTS ASSESSMENT

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* and the guide entitled *Cumulative Effects Assessment Practitioners' Guide, 1999*¹¹.

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. The proponent's assessment should emphasize the cumulative effects on the main VCs that could potentially be most affected by any components of the project. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project:
- 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 effects 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;

¹¹ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/

- 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 shall identify these effects and the parties that have the authority to act. In such cases, the proponent shall 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 final choice of VCs and the appropriate boundaries selected to assess the cumulative effects for each VC shall be determined in consultation with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders.

8 SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT

The EIS will contain a table summarising the following key information:

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

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

In a second table, the proponent will summarize all key mitigation measures and commitments which will more specifically mitigate any significant adverse effects of the project (i.e., those measures that are essential to ensure that the project will not result in significant adverse environmental effects).

9 FOLLOW-UP AND MONITORING PROGRAMS

A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the project. 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.

9.1 Follow-up Program

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

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

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

9.2 Monitoring

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

Specifically, the environmental impact statement shall present an outline of the preliminary environmental monitoring program, including the:

- identification of the interventions that pose risks to one or more of the components and the measures and means planned to protect the environment;
- description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required);
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts;
- guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned