

Guidelines for the Environmental Assessment of Major Mining Projects in the Yukon

September 2001

ABOUT THIS GUIDE

Who prepared these Guidelines?

The Environment Directorate of the Department of Indian Affairs and Northern Development (DIAND) has prepared these guidelines with the assistance of the Yukon Government Economic Development Branch, Access Consulting Group, Natural Resources Canada (NRCan), Canadian Environmental Assessment Agency, and the Regional Environmental Review Committee (RERC). These guidelines are intended to provide a mechanism for government to meet their legal responsibilities regarding environmental assessment for major mining development projects in Yukon as required under the *Canadian Environmental Assessment Act* (CEAA). As such, these guidelines may be amended or revised periodically as necessary to reflect legislative or administrative changes. In the event of a discrepancy between any of the referred legislation and these guidelines, the relevant Acts and Regulations shall prevail.

Who are these Guidelines for?

These guidelines are intended primarily for major mining project proponents who intend to complete environmental assessment (EA) submissions for the appropriate Responsible Authorities (RAs). For the purposes of these guidelines a major mining project is defined as a hard rock mining project that requires a Type "A" Water Use Licence. These guidelines are structured so that they can also be used as a reference guide for government authorities and other stakeholders.

What is the purpose of these Guidelines?

The purpose of these guidelines is to provide project proponents with:

- An overview of the CEAA and EA requirements for major mining projects;
- Information requirements to complete a Project Description;
- Information requirements to complete an Environmental Assessment Report (EAR);
- Suggested practical approaches and guidance to assist with completion of EA submissions; and
- A document to increase certainty, clarity, and consistency with respect to information requirements.

What do these Guidelines cover?

These guidelines provide generic information requirements for the two principle documents required for environmental assessment of major mining projects in the Yukon: Project Descriptions and Environmental Assessment Reports. Specific information requirements for particular mining projects are not addressed as part of these Guidelines. The Guidelines are intended to outline the general information requirements that are necessary to enable the RA(s) to make an assessment determination about a project. Detailed project-specific information requirements may be required by the RA(s), in which case project-specific information guidelines would be prepared as necessary, dependent on the nature of the project being proposed and its potential adverse environmental effects.

In the Yukon, DIAND is normally a Responsible Authority (RA) for mining projects, according to CEAA. This department usually takes the role of a lead RA for the environmental assessment of major hard rock mining projects, although there are often other RAs involved. Other federal departments traditionally involved in EA were extensively consulted throughout the development of these guidelines. These guidelines, however, reflect the requirements of DIAND, and RAs other than DIAND may require additional information to complete an assessment. These RAs work co-operatively with DIAND to create project-specific guidelines where necessary.

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1 OVERVIEW

This document, “Guidelines for the Environmental Assessment of Major Mining Projects in the Yukon” (Guidelines), is intended to provide clarity to proponents of major mining projects on the federal environmental assessment process and the information requirements necessary to ensure that this process is completed as required by law. The Guidelines conform to the legislative requirements of the CEAA and the CEAA Responsible Authority’s Guide.

The Guidelines convey:

- Requirements of the Canadian Environmental Assessment Act and provide guidance on conducting an environmental assessment (EA) in Yukon;
- Procedures and requirements for conducting an EA with rationale to ensure that adequate documentation is provided by the proponent to enable preparation of a screening report for the project;
- Other regulatory requirements and specifications to support EA documentation; and
- An outline for preparing Project Descriptions and Environmental Assessment Reports (EARs) for major mining projects.

The EA process is a first step towards approval of a major mining development. The Guidelines focus on the stages of EA by providing guidance for information requirements for the Project Description and EAR documents. It is recognized that similar types of information and project detail may be required for regulatory approvals. Providing sufficient design detail at the EA stage should assist with securing necessary regulatory approvals.

The Guidelines reference the extensive body of existing guidelines, procedure manuals and policy statements produced by the CEAA Agency, and were developed with assistance from federal and territorial departments and researchers aiming to assist the proponent with preparation of EA documentation.

1.1 GUIDELINES ORGANIZATION AND AUDIENCE

The Guidelines are organized into five major sections containing information requirements for both the Project Description and EAR. The document has been prepared with the project proponent in mind. However, it is structured so that it can be used as a reference guide for government authorities and other stakeholders. The text is written in plain language and contains a glossary to define technical language.

Section 1 of the Guidelines provides a general overview of the federal EA process as required by CEAA, and the applicability and criteria of CEAA to major mining projects in the Yukon. An overview of the how the federal EA process is implemented in the Yukon is presented along with important considerations for EA as it applies to major mining projects.

Project Description guidance is provided in Section 2. The proponent is encouraged to provide in depth and concise information at this stage of EA so that project-specific EAR guidelines can be developed to provide focused and refined information requirements that will lead to an efficient EA process.

Guidance information for preparation of the EAR documentation is presented in section 3. This section builds on the EA requirements and information presented in the Section 2 so that an all-encompassing document is prepared for government and public review. The approach taken in the Guidelines ensures that sufficient project information is provided by the proponent to allow for a complete and thorough environmental assessment as required under CEAA.

A glossary of terms and definitions used throughout the document is provided in Section 4. References are provided Section 5.

A suggested report table of contents for both the Project Description and EAR are presented Appendix I.

1.2 GENERAL CEAA REQUIREMENTS

The *Canadian Environmental Assessment Act* (CEAA) sets out in legislation the responsibilities and procedures for the environmental assessment of projects involving federal departments. The Act establishes a clear and balanced process for assessing the environmental effects of project proposals early in the planning stages. The Act applies to projects in which the federal government holds decision-making authority, whether as a proponent, land administrator, source of funding, or regulator (FEARO, 1994). A federal authority that has decision-making authority is a Responsible Authority (RA) for the project. In the Yukon, DIAND is typically the lead RA for major mining projects, and in some cases other federal authorities may also be RAs.

CEAA states four broad objectives:

- To ensure that the project environmental effects receive careful consideration before RAs take action;
- To encourage RAs to promote sustainable development, thereby achieving or maintaining a healthy environment and a healthy economy;
- To ensure that projects proposed in Canada or on federal lands do not cause significant adverse environmental effects outside the jurisdictions in which the projects are carried out; and
- To ensure an opportunity for public participation in the EA process.

The following general principles from the *Responsible Authority's Guide to the CEAA* (FEARO, 1994) should be used in the application of the Act:

Early application – EA is a planning tool that should be carried out early in project planning and design stages to ensure that environmental factors are considered and incorporated into the decision-making process.

Accountability – EA is a self-assessment of projects for environmental effects by federal departments, a cornerstone of the process.

Efficient and cost effective - Each project should undergo only one EA in a coordinated, efficient, cost effective manner that matches the scale of the project's likely environmental effects.

Open and participatory - Public participation is an important element of an open and balanced EA process.

CEAA prescribes five types of EAs including screenings, class screenings, comprehensive studies, mediations, and panel reviews. Screenings, class screenings and comprehensive studies are conducted by RAs, whereas the Minister of Environment and the Canadian Environmental Assessment Agency (Agency) conduct mediation and panel reviews. In the Yukon major mining projects are generally assessed as screenings or comprehensive studies, depending on the proposed activities triggering assessment.

Guidance

Legislation, policy statements and a comprehensive list of publications pertaining to environmental assessment is available on the CEAA Agency website:

www.ceaa-acee.gc.ca

1.3 FEDERAL ENVIRONMENTAL ASSESSMENT PROCESS IN THE YUKON

1.3.1 *Level I and II assessment at DIAND*

In the Yukon, the Northern Affairs Program (NAP) of the Department of Indian Affairs and Northern Development (DIAND) is responsible for conducting a majority of the environmental assessments that occur in the territory, including proposals for mining developments. To ensure that projects receive a degree of assessment that is appropriate for the size and complexity of the proposal, DIAND divides the assessment process into two levels:

Projects which are generally small-scale and have little potential for environmental effects are assessed as 'Level I' assessments, as part of the routine application process for regulatory approvals such as land use permits, Type B water licences and mining land use approvals. For more complex projects with greater potential for significant environmental effects and public concern, multiple regulatory approvals and/or involvement of other departments as federal authorities or RAs, 'Level II' assessments are conducted. A Level I project may be referred to a Level II process at any time during an assessment. Mining projects are generally assessed as Level II projects.

There are two types of Level II environmental assessment: screenings and comprehensive studies. The latter is for projects with greater potential for significant adverse environmental effects or public concern that meet a threshold of activity on the *Comprehensive Study List* regulations under CEAA. These projects require a broader and more comprehensive environmental assessment. There is also the potential for a Level II assessment to be referred to a panel, though this level of assessment is reserved for projects with justified significant environmental effects, or where significant effects are uncertain, or public concern warrants further investigation.

1.3.2 *Regional Environmental Review Committee*

To facilitate the environmental assessment process for Level II projects, DIAND has created the Regional Environmental Review Committee (RERC), an advisory committee consisting of representatives from federal and territorial departments, First Nations and other specialists and experts in the field of environmental assessment. The RERC is chaired by DIAND's Director of Environment, while Project Managers from this Directorate present project-specific information to the Committee for their review and advisement. In some cases, technical or socio-economic issues may be addressed by sub-groups of the Committee that may be established for specific projects.

1.3.3 *DIAND Level II CEAA Assessment Process*

The EA process for a major mining project commences when the proponent submits a Project Description to DIAND. Figure 1 illustrates the present Level II EA process with an indication of proponent and RA(s) tasks for completion of the assessment. Once DIAND and any other RAs

determine that the Project Description is adequate, the project proponent will be required to develop and prepare an EAR. Project-specific EAR guidelines may be prepared by the RA(s), with input and advice from RERC, to assist the proponent.

The level of detail required in the EAR is based on the information provided in the Project Description and the information needed by the RA(s) to adequately assess potential adverse effects, to analyze proposed mitigation measures, and to make a determination of the significance and likelihood of the effects. The EAR is the key document that the RERC and other stakeholders use to assess the project. If the EAR does not contain all the necessary information for the RA(s) to complete the environmental assessment, addendum submissions may be required. Following a period of public review of the EAR, DIAND and other RAs prepare a screening report or comprehensive study report, with the advisory assistance of RERC,. The screening or comprehensive study report includes a recommendation of DIAND's (and other RAs) course of action according to CEAA.

The screening or comprehensive study may make one of the following recommendations (after considering mitigation):

- The project may proceed if it is not likely to cause significant adverse environmental effects;
- The project may not proceed if there are likely to be significant adverse environmental effects that cannot be justified; or
- If the project is likely to generate significant adverse environmental effects but those effects may be justified, then the project must be referred to a mediator or panel review.

Both the screening report and comprehensive study report are provided to the public for comment before a final decision about the project can be made. In the case of a comprehensive study, it is submitted to the Agency and the Minister of Environment for review.

A final decision regarding the project is not made until comments are received from the public. In the case of a comprehensive study, the Minister of Environment will determine whether the suggested decision is appropriate, again after considering public comment. If the project is approved it may proceed to the regulatory stage. Mitigation measures determined through the EA process would be included in the terms and conditions of licences, permits or leases.

Typical permits or licences required for a major mining project include a Water Use Licence issued by the Yukon Territory Water Board and a Production Licence issued by DIAND Mineral Resources. A Wildlife Agreement may also be required in areas where significant wildlife values exist. A complete listing of permits required in Yukon is available from the Environment Directorate of DIAND.

1.3.4 The Changing Face of Environmental Assessment in the Yukon

Since 1995, environmental assessment in the Yukon has been conducted by the federal government under the Canadian Environmental Assessment Act. New legislation, to be established as requirement of Chapter 12 of the 1993 Umbrella Final Agreement, will create a new environmental assessment process that will involve three levels of government - federal, territorial and First Nations - and will require assessment on the land of all three respective governments. This new process, the development assessment process, will effectively replace the CEAA environmental assessment process and will include a requirement for assessment to consider socio-economic effects as well as environmental effects of proposed development projects. The new assessment process will be set out in the Yukon Environmental and Socio-economic Assessment Act (YESAA).

Dependent upon the timing of the devolution of DIAND to the Yukon Territorial Government (YTG), environmental assessment may, for an interim period, be conducted under the Yukon Environmental Assessment Act (YEAA), which is designed to be ‘mirror’ legislation to CEAA (ie. the requirements for EA will not change from CEAA requirements). YEAA sets a legislative framework for EA during the time after devolution and prior to the enactment of YESAA. However, if YESAA legislation (the development assessment process) is enacted prior to devolution, then YEAA will not be required.

Guidance

For information on the proposed Yukon Environmental Assessment Act (YEAA), contact the Environment Directorate of DIAND or the Development Assessment Unit, Executive Council Office of the YTG.

For information on the development assessment process and the proposed Yukon Environmental and Socio-economic Assessment Act (YESAA), contact the Development Assessment Process (DAP) Unit of DIAND or the Development Assessment Unit, Executive Council Office, YTG.

1.3.5 Traditional Ecological Knowledge

The proponent shall make all reasonable efforts to collect and/or facilitate the collection of traditional knowledge for integration into the EA in collaboration with First Nation’s communities and organizations. First Nations peoples living on the land and harvesting its resources have developed, over thousands of years and through observation, oral history and instruction from their elders, an in-depth understanding and knowledge base of their local and regional land base. This knowledge includes an understanding of the functioning of ecosystems (resources abundance, distribution and cycles); land and resources management; social, economic and cultural conditions, and the relationships between these factors.

Traditional knowledge is accepted worldwide as a valuable source of knowledge. It can assist in such areas as locating potential archaeological sites, determining habitat requirements for specific species of wildlife, identifying sites of spiritual significance, and providing information on fish and wildlife populations.

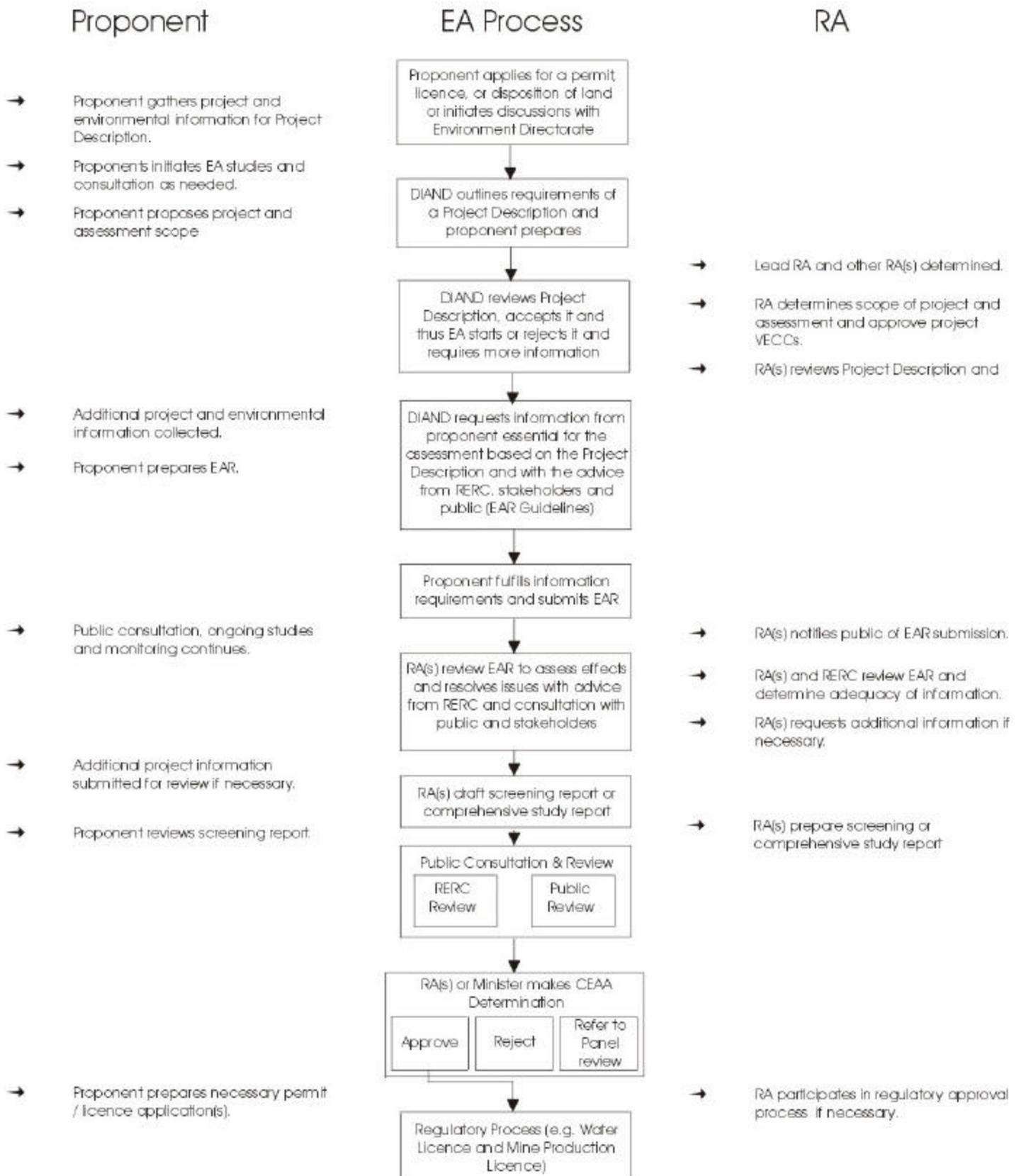
Traditional knowledge is, therefore, also a valuable source of information for project assessment, as it can be used in combination with scientific information to confirm evidence or provide more detailed information than is otherwise available. The proponent is therefore required to consider traditional knowledge in various stages of the project assessment, including: scoping of valued ecosystem and cultural components (VECCs); the description of existing environmental conditions; predictions of environmental effects; development of mitigation measures; evaluation of significance; and monitoring and follow-up as required.

In recognition of intellectual property rights of traditional knowledge holders, the environmental assessment report may not include all of the original traditional knowledge that has been collected. However, information must be sufficient to allow reviewers to derive conclusions about the rationale for decisions made in the report that are based upon traditional knowledge that has been collected.

The collection of traditional knowledge can be undertaken through community interactions (e.g. open house meetings) and/or research studies. When conducting a research study, First Nation

communities must be asked to be actively involved and the use of traditional knowledge must be approved through consultation with the First Nation to determine the appropriateness of its use. Where traditional knowledge is not available to the proponent despite appropriate diligence, the proponent shall describe efforts taken to obtain it.

Figure 1 - DIAND Level II CEEA Assessment Process



1.4 IMPORTANT EA CONSIDERATIONS

The process of EA can proceed smoothly when project documentation is submitted which clearly presents the project, describes adverse environmental effects, proposes appropriate mitigation for these effects, and analyses the significance of any remaining effects. It is the project proponent's responsibility to prepare the necessary Project Description and EAR with advice and direction from the RA(s) and other stakeholders. The proponent should be familiar with the EA process and the information requirements before formalizing the EA to ensure that the necessary project documentation will be provided for the EA. It is recommended that the proponent become familiar with EA documentation referred to throughout these Guidelines in order to assist with the production of quality submissions on their project.

Initial contact and early discussions with the RA(s) should be conducted prior to the development of a Project Description, in order to establish the scope of the project for the purposes of assessment and the scope of the assessment itself, including the potential environmental effects of concern. The RA(s) will provide pertinent legislation, identify applicable policies to help prepare the EA documentation and establish the context and temporal and spatial boundaries for the assessment, including the parameters for cumulative effects assessment.

The identification of known valued ecosystem and cultural components (VECCs) within the project area will help to define the unique features and sensitivity of the area and should be determined through consultation with the RA(s) and other stakeholders. VECCs are components of the biological, physical and human environment that are considered valuable in the EA process. They provide a focal point to the assessment by helping to prioritize assessment efforts on key areas of importance.

Early and continued consultation with First Nations and other potentially effected stakeholders is also an important component of the EA process. Proactive consultation with RA(s) should lead to early identification and concurrence on these consultation requirements, which in turn should help to shape the context for the EA and focus the project information requirements and analyses.

1.5 PROJECT ENVIRONMENTAL ASSESSMENT GUIDELINES

Section 2 and 3 provide guidance and the information requirements for the development of Project Description and EARs. Many aspects of the EA are similar to both types of reports. The EAR builds on the information initially provided in the Project Description, with an increased level of detail and complexity as knowledge and understanding of the project, environmental setting, project-environment interactions, mitigation measures and significance are gained. As the project evolves, the proponent is expected to further refine plans, analyses and predictions to support the EA determination.

The basic steps involved in assessing environmental effects include:

- Description of the project;
- Project and assessment scoping;
- Description of the environmental conditions;
- VECC identification;
- Identification of project effects and project environmental interactions;
- Analysis of the effects;
- Identification of mitigation and identification of residual effects;

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- Evaluation of significance;
 - Follow-up program and/or monitoring plans.

The Guidelines recognize the continuum of the EA process for the two phases of the assessment, the Project Description and the EAR. Key EA information requirements are discussed, rationalized and defined as part of the Project Description guidelines. This information is also applicable to (and further refined) in the EAR.

Where possible the Guidelines refer to existing documents, manuals, guidelines, and policies to assist the reader with development of the project documentation. Information requirements for the Project Description and EAR are discussed separately. However, the recommended report format generally remains the same for each document. Appendix I contains a recommended Table of Contents for the Project Description and for the EAR.

2 PROJECT DESCRIPTION INFORMATION GUIDELINES

Project Description is defined in the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements* as any information in relation to a project that includes:

- A summary description of the project;
- Information indicating the location of the project and the areas potentially affected by the project;
- A summary description of the physical and biological environments within the areas potentially affected by the project; and
- The mailing address and phone number of a contact person who can provide additional information about the project.

As a minimum, the requirements for preparation of Project Descriptions should conform to this definition of Project Description. An *Operational Policy Statement for Preparing Project Descriptions* is available from the Agency (August, 2000).

Guidance

The Agency's website should be consulted for the most current versions of Operational Policy Statements (see www.ceaa-acee.gc.ca).

Previous experience with the EA of mining projects has shown that some of the basic EA components or information requirements have not always been contemplated or considered by the proponent early in the EA. To address this, specific guidance is provided in Section 2 (Project Descriptions) so that key EA information considered necessary to complete the EA is gathered early in the planning process, reducing the potential for repeated and time consuming information requests by the RA(s).

The Project Description is intended to provide preliminary information about the proposal for planning purposes and the level of detail provided should be appropriate to the scale and complexity of the project and the sensitivity of its location.

Existing knowledge of environmental and socio-economic conditions and cultural resources potentially affected by the project should be presented along with potential or apparent data gaps. A preliminary indication of VECCs should be provided along with any planned study programs designed to address potential data gaps and predictions of effects. Known or adverse potential environmental effects associated with the project should be identified and conceptual plans for mitigation presented. Expected environmental management systems or waste management plans needed for the project should be identified. The level of engineering detail for the project description should provide the expected locations and general arrangement of proposed facilities and infrastructure. These plans should be supported by existing data on site conditions.

The proponent should provide a number of hard copies of the Project Description, including any supporting documentation such as maps for the RERC review. Electronic copies of submissions are also useful to assist with the EA, however the RA(s) Project Manager should be contacted first to confirm the number of report copies needed.

The following sections discuss the major components of the Project Description and provide a recommended report format and outline of information required. Appendix I provides a recommended Table of Contents for the Project Description.

2.1 PROJECT INTRODUCTION

The following information should be provided to introduce the project:

- Provide a brief introduction to the project, its location and the proponent(s) involved.
- Briefly present key project components including: size, cost, activities, and schedule and timing constraints.
- Review any important context for the assessment such as unique environmental features or resources, other area activities or stakeholder's interests.

2.1.1 Project Purpose and Need

The “need for” the project identifies the fundamental rationale for the project. That is, what problem or opportunity is the proposed project going to solve or satisfy? The “purpose” of the project is what will actually be achieved by carrying out the project. The consideration of “purpose” of the project is required for comprehensive studies and public reviews but is discretionary for screenings. The consideration of “need” for the project is at the discretion of the RA(s) for all assessments. The requirement for this information should therefore be discussed with the RA(s).

- Describe the specific project objectives.
- Indicate the rationale for the project (e.g., market demand, quality, quantity and location of the mineral deposit).

2.1.2 Project Proponent

- Introduce the proponent and the corporate and project management structure. Provide important contact information for key personnel involved.
- Indicate any project rights and interests such as joint property or mineral agreements, or agreements with other stakeholders.
- Briefly summarize mining related experience and company features of interest (e.g., ISO certifications, corporate and project-level environmental management/decision-making approach, record of environmental compliance, record in implementing socio-economic agreements, experience in working with aboriginal communities).

2.1.3 Federal Involvement and Authorizations Required

- Identify the CEAA trigger(s) and possible RA(s) involved. Identify any relevant meetings or discussions held with federal authorities.
- Identify any unique plans, policies, special designations or other arrangements that affect land use in the project area. Contact with regional or local land managers and First Nations may assist in determining unique features or designations in the area.

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- Identify known applicable legislation or regulations and required approvals/permits for the project.
 - Provide a distribution list of the parties who have received or are expected to receive the Project Description.

Guidance

A Water Use Licence issued by the Yukon Territory Water Board and a Quartz Mining Licence issued by DIAND are typically the most significant authorizations required for a major mining project. Although the *Yukon Waters Act* and associated regulations do not have specific water related standards, the *Metal Mining Liquid Effluent Regulations* issued under the *Fisheries Act* and the *Canadian Environmental Quality Guidelines* (CCME, 1999) respectively have served in the past as criteria for determining effluent discharge standards and assessing receiving water quality.

2.2 PROJECT DESCRIPTION

The following information about the project should be provided:

- An indication of whether the concepts/technology being proposed are proven or whether there may be some uncertainty. Plans for proving the feasibility of the technology should be outlined.
- The current status of the project.
- Present the size, location, general site layout and legal land descriptions. Indicate land tenure. Provide appropriate maps and geographical co-ordinates.
- Identify the main project components, including the mine, the mill, other processing facilities, waste rock disposal sites, tailings ponds, concentrate storage areas, waste handling facilities, fuel storage areas, water management systems and indicate locations on suitable scale map(s).
- Describe the associated infrastructure necessary for the project including site access roads, airstrips, ports, energy generation and/or transmission infrastructure, camp and/or housing facilities.
- Identify the standard environmental practices to be applied to each of the proposed components.
- Describe the construction, operation and decommissioning phases of the project and indicate timing and scheduling.
- Describe the production process(es) to be used and indicate production capacity.
- Outline the project's raw material, energy, and water requirements and sources.
- Describe solid, liquid, or gaseous waste expected to be generated by the project and outline plans to manage project wastes.

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- Outline expected workforce requirements and camp/housing facilities.

The proponent should provide conceptual designs for structures and facilities with adequate supporting documentation to enable proper definition of EAR requirements.

2.3 ALTERNATIVE MEANS AND ALTERNATIVES TO THE PROJECT

2.3.1 Alternative Means of Carrying Out the Project

“Alternative means” of carrying out the project are the various technically and economically feasible ways that the project can be implemented or carried out. This should consider realistic considerations of alternative mining methods as well as alternative locations, routes, implementation, operation and mitigation. In looking at alternative means, it is assumed that the project is a given and only alternative means of carrying out the project is an issue. The consideration of alternative means is at the RA’s discretion for screenings but is a requirement for comprehensive studies under CEAA.

- Identify and describe alternative means of carrying out the project that have been evaluated (for screenings, consult with RA(s) to determine if this is required).

2.3.2 Alternatives to the Project (Discretionary)

“Alternatives to” the project are functionally different ways to meet the project need and achieve the project purpose. The consideration of alternatives to the project is discretionary in screenings, comprehensive studies and public reviews. An evaluation should be carried out on the alternatives to the project including a discussion on whether the proposed project is required, and if so, whether this project is the best way to fulfil the objectives.

- Identify alternatives to the project (consult with RA(s) to determine if this is required).

Guidance

Refer to the *Agency’s Operational Policy Statement Addressing Need for, Purpose of, Alternatives to and Alternative Means* for further guidance in this area.

2.4 ENVIRONMENTAL CONDITIONS

The purpose of this section is to provide an initial description (overview) of the project’s environmental setting. This includes the biological and physical components as well as socio-economic, cultural, human health, traditional land use and other components that could be potentially affected by the changes in the environment caused by the project.

Key to documenting environmental conditions is the initial identification of VECCs, or environmental indicators.

2.4.1 Valued Ecosystem and Cultural Components (VECCs)

VECCs are defined as elements of the environment which are valued for environmental, scientific, social, aesthetic or cultural reasons. Selecting the project-specific VECCs is essential for focusing environmental assessment and the determination of significance of effects.

The process for identifying the VECCs varies with each project, however it usually begins with consultation with RA(s), other stakeholders and particularly local First Nations. Baseline research, literature review, species vulnerability reports, and community consultations are examples of information sources.

Examples of attributes that influence the selection of VECCs include:

- Ecological importance;
- Socio-economic importance (existing and potential);
- Cultural importance;
- Aesthetic value;
- Species that are rare or endangered;
- Responsiveness to impacts or stress; and
- Indicators that are representative of ecosystem health.

Historically, the types of VECCs selected for Yukon mining projects have included public and commercially important wildlife and fish species such as caribou, moose or chinook salmon, important cultural or heritage sites, designated protected or special management areas or ground and surface water quality.

VECCs should be selected with consideration of cumulative environmental effects. Even if the project on its own is unlikely to have a significant effect on a VECC, the combined effects of the proposed project along with other projects or activities may be significant and therefore should be considered.

The proponent should view the identification, selection and effects analyses of VECCs as an iterative process. As further information is gathered and analysed, the ability to identify the VECCs and to assess the significance of potential project effects in relation to VECCs will evolve throughout the EA. Project and assessment scoping, which requires approval of RA(s), will also help to further refine VECCs.

Guidance

Further information on the importance of VECCs in the EA and the methodologies for selection are contained in the Agency's *Responsible Authorities Guide for the CEAA* (FEARO, 1994) and *the Cumulative Effects Practitioner Guide*, (AXYS, 1999).

The Project Description should include:

- A potential list of expected VECCs for the project and the methodology and rationale used for selection.

2.4.2 Environmental and Socio-economic Conditions

The existing level of knowledge or understanding of the environmental and socio-economic conditions surrounding the project should be presented. This information should focus on key environmental conditions such as VECCs, and also provide a summary of other environmental conditions. Detailed environmental baseline information is expected for all key issues or VECCs identified through the scoping process. Environmental baseline studies should provide enough detail to allow for an understanding of the nature and extent of the project effects on a particular

environmental component. The proponent should consult with the RA(s) or other government agencies prior to initiating environmental baseline studies to ensure that research will be suitable for EA.

This information establishes the state of the environment before mining begins, and must provide an adequate basis for:

- The prediction of project effects;
- Observing changes occurring during mining (i.e., comparison against monitoring results once the project is implemented); and
- Monitoring recovery or restoration after decommissioning.

Existing or historic data can be gathered from existing EA reports, databases, specialist departments, First Nations, local community members, industry, academia, aerial photographs and satellite imagery.

Key aspects of the environment that require documentation include climate, air quality, noise, geology (including geochemistry), topography and soils (including terrain hazards, ground conditions, permafrost, and geotechnical conditions), vegetation, water resources (including hydrogeology, hydrology, surface and ground water quality), aquatic resources (including fisheries, benthos and sediments) and wildlife. Criteria for describing the environmental conditions include current status, average conditions, seasonal variation, and variation over multiple years. For biotic elements, other criteria might include, for example, population distribution, abundance, range, migratory routes, key habitats, habitat requirements and conditions, and sensitive periods in the life cycle. Any designated special status (e.g., vulnerable, endangered, extirpated) should be noted.

Key aspects of the socioeconomic conditions in the project area which require documentation include any conditions which have the potential to be affected by a change in the environment as a result of the project including:

- Human health (physical and psychological health);
- Socio-economic indicators (community demographics, quality of life, economy, recreational opportunities, home life, land tenure and designation, physical infrastructure, current and future land and resource uses – both commercial and recreational);
- Physical and cultural heritage including objects or structures of historical, archaeological, paleontological or architectural significance;
- Current land and resource use for traditional purposes by aboriginal persons.

It is recognized at this stage in the EA that not all environmental or socio-economic conditions will be known. However, documentation of existing conditions and potential data gaps can assist with focusing on important known information and identification of information which needs to be collected for the EAR.

The Project Description should:

- Document existing environmental and socioeconomic conditions and identify potential data gaps.
- Provide references for sources of data. To supplement this, RA(s) and other reviewers may be able to provide additional sources of information that the proponent is not aware of.

2.4.3 Study Program – Additional Data Collection

It is recommended that a study program be developed that outlines the additional environmental data to be collected to fill identified data gaps. Additional field investigations or surveys, monitoring or aerial photography may be required to fill data gaps or supplement existing information. The study program should outline expected study components, planned data collection methodologies and parameters, expected data review and analyses techniques and a program implementation schedule. The proponent should consult with specialist departments to review the adequacy of the study programs to ensure appropriate information is collected. Local First Nations should also be contacted for any traditional or local area knowledge. It is recommended that the study plan be reviewed with agencies prior to initiation of data collection.

An up-to-date list of contacts for various specialist departments and local First Nations is available from DIAND Environment Directorate, as well as a list of recommended EA documents containing selected references for various data collection programs and methodologies.

The Project Description should:

- Develop a study program to address identified environmental data gaps.

2.5 ENVIRONMENTAL EFFECTS ASSESSMENT

This section addresses and provides specific guidance on one of the fundamental requirements of CEAA, the prediction and determination of the potential environmental effects of the project on the surrounding environment, particularly on VECCs, and the likelihood of significant environmental effects following implementation of mitigation. The residual effects remaining after mitigation as well as their significance and likelihood should also be identified. Assessment for potential cumulative effects is also a requirement of the EA.

Techniques for assessment of environmental effects evolve with time and experience and certain types of methodologies are more appropriate for some types of projects than for others. Further reading materials on approaches to various EA methodologies are available from DIAND Environment Directorate.

The above sections for the Project Description provide guidance on the information requirements needed to introduce and describe the project and to present local environmental conditions, including a focus on VECCs. The next step in the EA is to present the information to enable an environmental assessment of project effects and their significance. The following sections outline the steps involved and the information required for the Project Description.

2.5.1 Project and Assessment Scope

Proper scoping of the project and of the assessment is critical to the EA process. It ensures that both the proponent and the RA(s) have a clear and common understanding of the project components and activities, boundaries (both spatial and temporal), key VECCs, and level of detail required for the EA. Scoping is the responsibility of the RA(s), however it is in the proponent's best interest to work cooperatively with the RA(s) to determine project and assessment scope. A scoping meeting with the RA(s) is a valuable way to define the project and assessment scope. The proponent should initiate a scoping meeting with the RA(s) prior to submission of the Project Description.

Guidance

To assist with project and assessment scoping, see information provided in the scoping section of the *Responsible Authorities Guide for the CEAA* (FEARO, 1994).

2.5.1.1 Scope of the Project

The scope of the project refers to the various components of the proposed undertaking or activity that will be considered as the project for the purposes of the environmental assessment. This must include the principal undertaking and any accessory activities or works that are directly linked to, or interconnected with, the principal project. The scope of the project includes the construction, operation, care and maintenance, closure and post closure or any undertaking in relation to the project. It should be noted that two or more projects may be combined into one EA, should the RA(s) determine that they are so closely related that they can be considered to from a single project.

The Project Description should provide the following information for project scoping:

- Clearly define the proposed project scope including all project components and accessory components that are planned or already in existence.
- Outline the rationale used to determine the proposed scope of the project.

The description of the project given in Section 2.2 provides details of all aspects of the project, while the scope of the project includes only the components that are to be assessed. The scope of the project must be approved by the RA(s) and therefore the proponent is highly encouraged to consult with the RA(s) when developing project scope.

2.5.1.2 Scope of the Assessment

The *Responsible Authority's Guide* (FEARO, 1994) lists the factors that must be considered for an EA. These factors are considered part of the scope of the EA.

Both a screening and comprehensive study must consider the following factors, and scope of factors, necessary to meet the requirements of CEAA as set out in the definition of environmental effect and as described in Section 16 of CEAA:

- Environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project;
- Cumulative environmental effects, including identifying other projects and the cumulative environmental effects of those projects in combination with the proposed project;
- Significance and likelihood of the effects;
- Comments received from the public in accordance with the Act and its regulations;
- Technically and economically feasible measures that would mitigate any significant adverse environment effects of the project;
- Any other matter relevant to the screening or comprehensive study that the RA(s) or, in the case of a comprehensive study, the Minister, may require.

Environmental effects of the project are defined as changes in the environment caused by the project, as well as certain effects that flow directly from those changes, including effects on:

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- Human health;
 - Socio-economic conditions;
 - Physical and cultural heritage, including effects on things of archaeological, paleontological, or architectural significance; and
 - The current use of lands and resources for traditional purposes by aboriginal persons.

Environmental effects also include the effects of any changes to the project that may be caused by the environment, such as avalanches, earthquakes, floods or other terrain hazards.

The proponent must also consider the following for a project undergoing a comprehensive study. One or more of these factors may also be required to be considered for a screening at the discretion of the RA(s):

- Purpose of the project;
- Alternative means for carrying out the project that are technically and economically feasible, as well as the environmental effects of any such alternative means;
- The need for, and the requirements of, any follow-up program; and
- The capacity of renewable resources that are likely to be significantly affected by the project to meet present and future needs.

The RA must approve the scope of the assessment to be considered in the screening or comprehensive study. This refers to the above factors as well as the defining geographic boundaries and timeframe of the effects (e.g. spatial and temporal boundaries).

The determination of spatial boundaries to be used in assessing effects should consider the following:

- The physical extent of the project and the area the proponent will control through leases (surface or sub-surface).
- The extent of aquatic and terrestrial ecosystem components potentially affected by the project.
- The local and territorial area of influence of socio-economic effects caused by adverse environmental effects of the project.

Spatial boundaries may vary for each VECC.

The temporal boundaries of the assessment should take into account all phases of the project including construction, operation, care and maintenance, closure and post-closure. Temporal boundaries may differ for each VECC.

Guidance

The Agency has prepared an Operational Policy Statement *Establishing the Scope of the Environmental Assessment* (September, 1998) which provides policy direction on the purpose of scoping and scoping considerations.

The Project Description should provide the following information for assessment scoping:

- Clearly define the proposed scope of assessment for the project, incorporating those factors outlined above.

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- Outline the spatial and temporal boundaries expected for the scope of the assessment including the scope and spatial and temporal boundaries for the cumulative effects assessment (see Cumulative Effects Assessment, Section 2.5.5, for further information).
 - Outline the rationale used to determine the proposed scope of assessment including the consultation carried out to define the scope (e.g. with government agencies, communities, First Nations and other stakeholders).

2.5.2 *Public Consultation*

Experience in the Yukon has shown that benefits can be realized when the proponent initiates discussions with government authorities, local First Nations and local communities as early as possible once a project has been identified. Indeed, there can be long-term benefits to beginning communication efforts during the exploration phase, even if the project is a long way from entering the EA process. Early consultation provides an opportunity for the company to introduce itself and its plans, including financing, marketing and other factors that may influence timing.

A consultation program should be developed as part of the EA process. This should involve consultations with:

- Government authorities, specialist departments and boards or agencies with responsibilities for EAs, mining projects, construction and operation permits and/or licenses;
- Government departments and agencies with the capability to provide expert advice to assist with the EA;
- Local First Nations governments whose traditional territories or interests may be affected. First Nation's traditional knowledge should be sought as part of the consultation process;
- Local governments that may provide services or housing or be otherwise affected;
- Other local stakeholder groups (e.g., community associations, or business associations);
- Other stakeholder groups with an interest in the land or natural resources that may be affected (e.g. Yukon Conservation Society, Renewable Resource Councils); and,
- Directly affected individuals (e.g. trapline holders).

A consultation program could include open houses, regular briefings, information sessions, or newsletters. Establishing a local company representative in the area can also be beneficial.

The Project Description should:

- Provide a consultation plan indicating what consultation has occurred to date as well as proposed future consultation.

2.5.3 *Project – Environment Interactions*

Project-environment interactions or effects can be determined through the use of a number of techniques, either individually or in combination. Typically assessment tools and techniques include:

- Checklists – A straightforward and easy to use technique that provides a summary of proposed activities and project impacts. They can be simple or complex.

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- Overlap maps – Visual map aided technique that displays the spatial relationship of information. This includes detailed computer modeled spatial analysis using GIS based interpretations. Overlap maps can display pre-existing project information as well as predicted information. Consideration of map scale is important with this technique.
 - Matrix tables – Simple tables that can describe the two-dimensional interactions or relationship between two sets of data. Matrix tables are limited to depicting one-on-one interrelationships.
 - Network models – a visual display technique that can depict the multiple interrelationships between several components. This technique can also show different levels of impact, but is limited in quantifying differences or displaying spatial relationships.
 - Impact models or numerical modeling - an effective technique that is used to quantify EA information. Useful when quantifiable information exists. Data limitations or assumptions should be detailed. Can be expensive to obtain information and generally requires specialist expertise.
 - Experts or groups – knowledgeable people, groups or specialist are useful tools for EA. Governments, consultants and other groups can bring useful project information, knowledge, professional judgment and common sense to the EA. First Nations and community members can provide useful traditional and local knowledge.

The Agency's "Cumulative Effects Assessment Practitioners Guide" provides further details on some of the techniques discussed above as they have been used in other EAs.

The Project Description should:

- Describe the predictive tools, techniques or models that will be used to determine environmental effects.

2.5.4 Predicted Effects

Once the project-environment interactions are identified, predicted project effects can be documented and mitigation measures or strategies developed. Predicted effects should be summarized for all environmental components, should consider all project related activities and should take into account the entire project, from construction through to decommissioning. The predicted effects should also include "combined" effects (e.g. where several project components could have a "combined" effect on a single VECC or where the project may affect several VECCs with a "combined" effect on another VECC or environmental component).

The Project Description should:

- Describe any known or potential environmental effects that the project would have on VECCs and environmental components.

2.5.5 Assessing Cumulative Environmental Effects

Cumulative effects assessment (CEA) is an assessment of the incremental effects of a project on the environment, when the effects are combined with those from other existing and future projects and activities. These incremental effects must be related to a direct environmental effect of the project, but the direct effect need not be significant on its own. As noted in

guidance provided in AXYS (1999), the assessment of cumulative effects requires consideration of some concepts that are not always found in conventional approaches followed in EAs. Specifically, CEAs are typically expected to:

- Assess environmental effects over a larger area outside of the footprint of the proposed project;
- Assess environmental effects over a longer period of time from the past and into the future;
- Consider effects on valued ecosystem cultural components (VECCs) due to interactions with other projects and activities, and not just the effects of the single project being assessed;
- Include an assessment of project effects in combination with other past, existing and future (e.g., reasonably foreseeable) projects and activities effects; and,
- Evaluate the significance of project effects in combination with those from other project and activities.

Reasonably foreseeable future actions are usually defined as those projects or activities which are currently in the assessment or permitting stage, or which have been assessed and permitted but have not yet been constructed. The proponent should consult with the RA(s) for possible future projects that should be included in the CEA.

Guidance

The CEEA Operational Policy Statement on *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act* (March, 1999) provides clarification and guidance to Responsible Authorities (RAs) on how cumulative environmental effects should be considered in environmental assessments conducted under CEEA.

A number of approaches have been used to assess cumulative environmental effects however the following components are generally considered:

- Issues identification including regional issues of concern
- VECCs and indicators selection
- Establishing spatial and temporal boundaries
- Identification of other project or activities with actions or potential effects on VECCs
- Analysis, characterization and assessment of actions or effects on selected VECCs
- Identification of mitigation measures
- Evaluation of significance of residual effects including comparison against thresholds or land use objectives
- Recommend follow-up programs/monitoring or future management options

Guidance

Further discussion on cumulative effect assessment can be found in the *Cumulative Effects Assessment Practitioners Guide* (AXYS, 1999) and *A Reference Guide for the CEEA Addressing Cumulative Environmental Effects* (FEARO, 1994). Numerous other resource materials are listed in the bibliography of recommended EA documents available from DIAND Environment Directorate.

The Project Description should:

- Outline how the potential cumulative effects are to be identified and assessed.

2.5.6 Mitigation Measures

Mitigation measures are designed to avoid or minimize potential adverse environmental effects. Although mitigation measures must be fully described in the EAR, information on the measures that will be taken to mitigate against a projects likely adverse environmental effects should also be introduced in the Project Description.

The Project Description should:

- Present all proposed mitigation plans or measures.

2.5.7 Significance Determination

As stated in FEARO (1994):

Deciding whether a project is likely to cause significant adverse environmental effects is central to the concept and practice of environmental assessment. Whatever adverse environmental effects are addressed and whatever methods are used, the focus of environmental assessment always narrows down to a decision about whether the project is likely to cause significant adverse environmental effects. The concept of significance cannot be separated from the concepts of “adverse” and “likely.”

According to guidance provided by FEARO (1994), the following general steps provide a framework in determining whether environmental effects are adverse, significant, and likely within the context of the Act.

- Determine whether the environmental effects are adverse
- Determine whether the adverse environmental effects are significant
- Determine whether the significant adverse environmental effects are likely

The RA(s) and/or the Minister of Environment are responsible for determining whether the environmental effects are adverse, significant and likely. However, this decision will be based on the information provided by the proponent and other information the RA(s) considers appropriate. It is important that the proponent provides the necessary information to document how adverse environmental effects were determined, and the rationale or process for analyzing and assessing significance of adverse effects and their likelihood.

FEARO (1994) provides guidance on how to apply different criteria to determine whether the environmental effect is adverse, significant and likely. The criteria are summarized below.

2.5.7.1 Adverse Environmental Effects

The most common way of determining whether the environmental effects are adverse is to compare the quality of the environment before the project with the predicted quality of the environment with the project in place, using relevant criteria from the following list. This approach requires information on baseline environmental conditions. Criteria for determining adverse effects include:

- Loss of rare or endangered species;
- Reductions in species diversity;

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- Loss of critical/productive habitat;
 - Transformation of natural landscapes;
 - Toxicity effects on human health;
 - Negative effects on the quality and/or quantity of the biophysical environment (e.g. surface water, groundwater, soil, land and air);
 - Reductions in the capacity of renewable resources to meet the needs of present and future generations;
 - Loss of current use of lands and resources for traditional purposes by aboriginal persons;
 - Foreclosure of future resource use or production.

The Project Description should:

- Present the methodologies that will be used to determine adverse environmental effects.
- Identify potential adverse environmental effects.

2.5.7.2 *Significance of Adverse Environmental Effects*

Environmental standards, guidelines, and objectives are commonly used to establish significance. They typically specify threshold levels, such as maximum acceptable ground-level concentrations of air pollutants. Where no such threshold standards or guidelines exist, other methods, such as risk assessment may need to be applied. Criteria for determining significance include:

- Magnitude;
- Geographic extent;
- Duration and frequency;
- Irreversibility;
- Ecological context.

Applicable environmental standards and guidelines that are used in Yukon include the *Canadian Environmental Quality Guidelines* (CCME, 1999), which provide environmental guidance for freshwater aquatic life, stream sediments, drinking water quality, etc.

A further discussion of these criteria and how they are used in the determination of significant adverse environmental effects is provided in the *Responsible Authority's Guide to the CEEA* (FEARO, 1994).

The Project Description should:

- Present the methodologies that will be used to determine significance of adverse environmental effects.

2.5.7.3 *Likely Significant Adverse Environmental Effects*

Criteria for determining likelihood include:

- Probability of occurrence; and,
- Scientific uncertainty.

Whenever possible, the assessment should try to apply statistical methods or risk based assessments to determine significance. Where such methods are not feasible, practitioners will need to use a qualitative approach to determining likelihood, based on professional judgment.

Guidance

The CEAA Reference Guide on *Determining whether a Project is likely to Cause Significant Adverse Environmental Effects* (FEARO, 1994) provides further details as well as the additional reference sources.

The Project Description should:

- Outline how the determination of the likelihood of significant adverse environmental effects would be carried out.

3 PROJECT ENVIRONMENTAL ASSESSMENT REPORT INFORMATION GUIDELINES

The purpose of the project Environmental Assessment Report (EAR) is to document the findings of the environmental assessment process that will lead to a decision by the RA(s). The proponent should integrate the EA into the project planning and decision-making process so that environmental and socio-economic conditions are considered in project planning. The EAR acts as the key document that the RA(s) and the RERC will use to make a determination on the EA. In this document the proponent uses presents detailed information about the project works and activities, environmental, socio-economic and cultural conditions, prediction of potential adverse environmental effects, planned mitigation measures, and an analysis of the significance and likelihood of effects taking mitigation into account. The RA(s) requesting and assessing the information review the EAR and make a determination on the likelihood and significance of the project's adverse environmental effects. The EAR assists the RA(s) to make a final legislated determination for the project.

The Project EAR documentation should expand upon the Project Description information and guidelines as previously discussed. The "building block" format for the Project Description guidelines provide a starting point for the EAR guidelines and should be expanded upon where necessary. Project-specific information requirements will, in most cases, be provided by RA(s) to enhance and modify the assessment as needed. Incorporating existing documentation and presenting further information on project works as the project evolves ensures that an all-inclusive public document can be distributed to all stakeholders for EA.

Sufficient detail must be provided about the project components and planned activities during all stages of construction, operation and closure to enable a complete understanding of potential project interactions with the environment. Detailed baseline studies focusing on key environmental and socio-economic conditions are necessary to document pre-existing conditions and provide a basis for prediction and analysis of effects. Mitigation measures or plans that are technologically feasible and defensible are required to eliminate or reduce project-related adverse environmental effects. Any residual effects remaining after mitigation should be identified. EA methodologies for identifying environmental effects and determining their adversity, significance and likelihood should be transparent and fully supported with analysis to enable the RA(s) to make a determination as required under CEAA.

Although the determination of significance is the responsibility of the RA(s), the proponent is encouraged to conduct an analysis of the significance of effects that will assist the RA(s) in making a determination. The analysis of the significance of adverse environmental effects is one of the main differences between the Project Description and EAR documents.

The following EAR guidance expands on the specific detailed information requirements needed to complete an EA and provides references and information sources or other guidelines to assist the proponent with adequate document preparation. Examples of detailed information typically required in the EAR for mining projects include:

- Project design criteria and parameters;
- Sufficient engineering design detail for major project earthworks or structures to enable the confirmation of expected performance, practicality, and feasibility;
- Project alternatives and other alternative means considered (if required);
- Detailed environmental and socio-economic baseline study results, particularly for specific resource components or VECCs;

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- Geotechnical investigation results and soil property analyses to confirm practicality and feasibility of proposed project component(s);
 - Physical structures stability analyses (e.g. waste rock dumps, tailings impoundment);
 - Meteorological and hydrological data with water budget analyses;
 - Detailed environmental effect predictions and analyses;
 - Cumulative effects assessment, and;
 - Other supporting studies or analyses required which demonstrate the effectiveness of planned mitigation measures or proposed design standards, particularly when contrary to accepted practice.

The information must be of sufficient detail to enable the RA(s) to evaluate the environmental conditions, expected environmental effects, the significance and likelihood of potential adverse environmental effects, cumulative effects assessment and the effectiveness of planned mitigation measures.

The level of engineering design required for the project will vary depending on project complexity and uncertainty, however the detail should be sufficient to support an assessment of the effectiveness of the project designs or mitigation measures.

The proponent should provide a number of hard copies of the EAR, including any supporting documentation such as maps for the RERC review. Electronic copies of submissions are also useful to assist with the EA, however the RA Project Manager should be contacted first to confirm the number of report copies needed.

For major mining projects, after the Project Description information has been accepted as complete by the RA(s), detailed project-specific EAR information guidelines will normally be developed by the RA(s) with the assistance of the RERC and the proponent, incorporating comments received from review of the Project Description. Depending on the adequacy and completeness of the EAR documentation submitted and issues raised through the assessment process, the RA(s) may require additional project information in order to complete the EA.

The following sections discuss the major components of the EAR and provide an outline of information requirements. Appendix I provides a recommended Table of Contents for the EAR.

3.1 EXECUTIVE SUMMARY

- Provide a concise non-technical description of key aspects of the proponent, project and environmental setting.
- Submit a summary of project information submitted and consultation efforts with stakeholders including First Nations.
- Describe any uncertainties and public concerns.
- Outline key environmental effects and proposed mitigation strategies and measures.
- Provide a summary of the analysis of significance and likelihood of adverse environmental effects, taking mitigation into account.

3.2 PROJECT INTRODUCTION

Provide the most current information on the project including information on the project proponent, and information previously submitted in the Project Description documentation (See section 2.1). Pertinent information from the Project Description is summarized below.

3.2.1 Project Overview

The intent of the project overview is to provide context rather than a description as a more detailed description of the project will follow.

- Provide a brief introduction to the project, the location and the proponent(s).
- Briefly present key project components, including: location, size, cost, activities, and schedule and timing constraints. Other projects or activities nearby should be noted.
- Review any important context for the assessment such as unique environmental features or resources, other area activities or unique stakeholder interests.

3.2.2 Project Purpose and Need

See Project Description guidelines for a discussion of project purpose and need.

As required, either by RA(s) (for a screening) or for comprehensive study, the EAR should address the project purpose and/or need.

- Describe the specific project objectives.
- Indicate the rationale for the project (e.g., market demand, quality, quantity and location of the mineral deposit).

3.2.3 Project Proponent

- Introduce the proponent and the corporate and project management structure. Provide important contact information for key personnel involved.
- Indicate any project rights and interests.
- Briefly summarize mining related experience and company features of interest. Include corporate environmental policy if available.
- Information on project funding and financial ability of the proponent may also be required for the EA.

Guidance

Refer to the Mining Association of Canada's website (www.mining.ca) for information on environmental policy and framework for mining projects.

3.2.4 EA and Regulatory Regime

- Identify the CEAA trigger(s) and possible RA(s) involved with the proposed project. Document any relevant meetings or discussions held with federal authorities.
- Identify any unique plans, policies, special designations or other arrangements that affect land use in the project area.
- Identify known applicable legislation or regulations and required approvals/ permits for the project including non-CEAA triggers (e.g. YTG administered legislation such as YTG Environment Act and regulations, YTG Wildlife Act and regulations and YTG Health Act).
- Provide a distribution list of the parties who have received the Project Description.

Guidance

Contact the Yukon Territory Water Board. Phone 867-667-3980, Fax 867 668-3628 for information on Water Use Licenses issued under the Yukon Waters Act and Regulations.

Contact DIAND Mineral Resources. Phone 867-667-3125, Fax 867-667-3832 for information on Quartz Mining Licenses issued under the Yukon Quartz Mining Act and Regulations.

3.3 DESCRIPTION OF THE PROPOSED PROJECT

This section should provide information on all aspects of the project including all phases of mine development including construction, operation, temporary shutdown and decommissioning.

3.3.1 Project Location

- Provide a location description. Present the size, general site layout and legal land descriptions. Indicate where possible land tenure. Provide appropriate maps and geographical co-ordinates.
- Provide a description and map of mineral claims or lease boundaries.
- Indicate distance to nearest community by road and/or air.
- Summarize project area in relation to drainage basins and eco-regions.
- Present project area topographic maps at appropriate scale (1:30 000 or 1:50 000).

Guidance

Where possible maps presented in the EAR (e.g., geology, surface geology, terrain hazards, general arrangement plans, vegetation, reclamation plan, etc.) should be standardized (topographic contours, scale, north arrow) and submitted at similar scales (1:30,000 or 1:50,000).

3.3.2 Project History

- Describe the project history and current status.

3.3.3 Project Facilities and Design

This section should describe in sufficient detail the essential components, facilities and equipment required for the project. The description should include maps and drawings as necessary with the project footprint included in a general arrangement drawing. All major project components, structures and facilities should be clearly labelled on the general arrangement drawing. Preliminary designs and engineering should be described for major mining components including processing facilities, impoundment structures, underground openings to surface, leach pads, waste rock dumps and open pits. Applicable design criteria, standards, or parameters must be outlined along with the results of any investigations to establish site parameters (e.g. seismicity, geotechnical parameters and soil bearing capacity). Process diagrams should be included for any industry related processes. Measures or technologies to control waste emissions or effluents should be described and process plans and flow sheets presented.

- Describe the main project components, including the mine, the mill or heap leach pad, other processing facilities, waste rock dumps, tailings impoundments, ore and concentrate storage areas, waste handling facilities and disposal areas, fuel and chemical storage, mine and camp facilities, haul roads, power lines, pipelines, and affected drainage courses. Identify the locations on suitable scale general arrangement map or drawing.

Guidance

Geotechnical Considerations for Northern Mining Developments. Prepared for Water Resources, NAP Geo-Engineering (M.S.T.) Ltd., 1990.

Seismic Risk Evaluation. Prepared for Environment Directorate. Hall, M., (Amerok Geophysics), 1992

Dam Safety Guidelines. Canadian Dam Safety Association, 1999.

Guidelines for Determination of Permafrost Conditions Prior to Site Development. Prepared for Exploration & Geological Services, DIAND. Burn, C. R., 1997.

Waste Water Management Guidelines and Water Balance Model. Prepared for Canada Centre for Mineral and Energy Technology (CANMET). Golder Associates Ltd., 1995.

3.3.4 Project Geology

The regional, property and ore deposit geology should be described with supporting figures at an appropriate scale. The estimated size of the reserves (both proven and probable) for each ore body, and the ratio of ore to waste rock should be described. Diagrams showing the relative locations of ore bodies to other facilities such as waste dumps should be provided and appropriate results of metallurgy test work should be provided as supporting data.

Detailed geochemical information should be provided for ore, waste rock, rock walls, and any other rock types that would be exposed or disturbed during development and operation of the mine, including the data and results from tests that have been conducted (whole rock analyses, mineralogy, acid-base accounting, etc.). Geochemical test work and mine planning should address potential for metal leaching and acid rock drainage of all rock types.

- Describe the regional geology in relationship to the project. Use 1:250,000 or better scale map.
- Describe and map the property geology (1:10,000 scale). Indicate drill hole locations and type (DDH or RC). Outline any exploration developments.
- Describe the major rock types present, indicating petrology, mineralogy and structure.
- Present and describe all geochemical results of all lithologies in the project area. Data and results from acid-base accounting, kinetic testing, slaking, freeze thaw, and metal leaching tests should be presented and discussed. The acid-neutralizing capability of the different rock types should also be provided.
- Outline future reserves or property exploration potential. Clearly specify which reserves are part of the proposed project.

Guidance

Research Design for Northern Acid Rock Drainage; Northern Mine Environment Neutral Drainage Studies No. 4. Prepared for DIAND Norecol, Dames & Moore, Inc., 1994.

Guidelines for ARD Prediction in the North. Prepared for DIAND. Steffen, Robertson and Kirsten, 1992

Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. Prepared for BC Government. Price, W.A. and Errington, J.C., 1998.

Policy for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. Prepared for BC Government. BC MEM and MELP, 1998.

3.3.5 Description of the Project Components

The proponent shall provide a detailed description of the mine site components listed below. Selection criteria, discussion of alternative and rationale for final selections of all components and related facilities should be discussed in Section 3.4 Project Alternatives. This section should present information on the key technologies and processes associated with the proposed project.

It should be recognized that the level of detail required for the various components of the project will vary, in some cases with specifications approaching a permitting level of detail. Sufficient design detail must be submitted, along with supporting data, to allow for a detailed technical review of the proposed project to confirm that it is practical, feasible and will perform as expected.

3.3.5.1 *Mine Plan*

This section should describe the proposed mining method(s) and the major steps in developing and operating the mine.

- Describe the mine development plans, including schedules, phasing of pit/underground development and rate of ore extraction. Discuss equipment types handling practices. Design details of the open pit and/or underground mine development and settling ponds are required. For open pits, detailed information on the slope of pit walls, bench heights, de-watering methods and timing and final volumes of ore and waste rock removal from the pits must be provided. For underground developments, provide plans and cross-sections detailing the location, geology, ore body, and geotechnical properties of the proposed underground workings. Describe the proposed mining methods, sequencing, size of openings and underground support requirements. Storage areas for stockpiled ores should be delineated on a map.
- For heap leach pads, provide pad location, selection criteria, pad and impoundment designs, liner and event pond designs, construction methods, leakage detection systems, seepage collection, solution management and processing details.

Guidance

For further information on heap leaching, see *Introduction to Evaluation, Design and Operation of Precious Metal Heap Leaching Project*, Society of Mining Engineers Inc. (1988). The *Technical Guide for the Environmental Management of Cyanide in Mining* (Higgs, 1992) should also be reviewed.

3.3.5.2 *Explosives and Related Infrastructure*

This section should provide details on explosives, their supply, manufacture use, and related infrastructure for the project.

- Outline blasting requirements, explosive type, consumption and supply.
- Describe the explosives-related infrastructure including: explosives and detonator magazines, explosive factory and/or manufacturing facilities, fuel storage, ANFO storage, maintenance/wash areas, process trucks and their parking areas.
- Provide a detailed site plan of explosives-related infrastructures showing layout and distances to the nearest body of water, public traffic routes (roads, railways, navigable water ways) and inhabited buildings (on and off site).

3.3.5.3 Ore Processing

This section should discuss ore processing for the project.

- The process of extracting metals or minerals from the ore should be described. Facilities and equipment should be identified and a description of the beneficiation and extraction process provided. Process diagram(s) or flowsheet(s) should be included for any related processes. Measures or technologies to control waste emissions or effluents should be described and flow sheets presented. All supporting metallurgical testwork and waste characterizations should be included and discussed.
- A description of the ore process facilities (milling, heap leaching) should be provided, including metallurgical testing, chemical inputs, products and wastes. If heap leaching is proposed, a description of both the leaching and post-leaching processes should be provided, including chemical inputs, products and wastes.

3.3.5.4 Waste Rock Disposal

- Describe the various waste rock lithologies, quantities and disposal facilities. Waste rock geochemical testwork and characterization in support of acid rock drainage and metal leaching properties should be described and presented. The location of disposal facilities should be mapped.
- Describe the waste rock disposal methods, containment measures and dump locations for each type of rock waste. This should include waste rock segregation and adaptive management techniques.
- Present waste rock dump engineering designs and include details on the dump staging, scheduling, design criteria (stability issues) and slopes. Discuss foundation stability issues including the effects of groundwater and permafrost on the dump foundations. A detailed evaluation of the foundation conditions and supporting data should be provided.
- Identify and highlight any potential environmental concerns and discuss techniques or methods to address potential issues as part of the disposal plan.

Guidance

Investigation and Design of Mine Dumps. Prepared for British Columbia Mine Dump Committee. Piteau Associates Engineering Ltd., 1991.

Operation and Monitoring of Mine Dumps, Interim Guidelines. Prepared for British Columbia Mine Dump Committee. Klohn Leonoff Ltd., 1991.

3.3.5.5 Tailings Disposal

- Engineering drawings and designs are required for any tailing impoundment.
- Provide details (including specifications) of dam design including design criteria and risk assessment.
- Describe the dam foundations and provide details of geotechnical conditions, permafrost, slopes, seepage, and piezometric surface.

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- Describe the materials and characteristics for tailings dam including the quantities and sources of materials. Supporting data must be provided to confirm that the proposed material meets design requirements. Describe, locate and provide designs for spillways and diversions.
 - Provide a detailed water balance (budget) for the tailings pond and anticipated contaminant releases from the tailings impoundment. The water balance should also include worst case scenarios in regard to wet and dry climatic conditions.
 - Provide details on seepage control measures or design features which are intended to improve effluent water quality.
 - Detailed information on facility staging and future dam additions and designs may be required if included within the scope of the project.
 - Outline contingency plans, including structures that will be in place in the event of failure/breach of the tailings impoundment.

Guidance

A Guide to the Management of Tailings Facilities. Prepared for Mining Industry. Mining Association of Canada, 1998

Dam Safety Guidelines. Canadian Dam Safety Association, 1999.

3.3.5.6 Site Water Management Facilities and Associated Infrastructure

- Describe water management systems for all mine components, including diversion, withdrawal, drainage operations, stormwater management, sediment control and impoundments. A water management plan should be developed for the project.
- Provide a mine annual water budget including sources and quantities of all process water and an estimate of its chemical composition at different stages of the mining process. Describe with supporting testwork the discharge/tailings effluent and proposals for segregation, treatment and/or recycling. Outline proposed receiving water and/or effluent discharge standards or objectives.
- Present a water management plan including activities and programs to address wastes not discussed above. Discuss all effluents released including process by-products and waste products and outline plans for waste control, treatment and management strategies.

3.3.5.7 Site Facilities and Associated Infrastructure.

- Describe the size and location of site facilities including processing facilities (i.e. mill, processing plant), waste and garbage disposal areas, mine and camp facilities, powerhouse or transmission lines and other infrastructure (e.g. pumphouse, pipelines). Identify facilities that will be needed during construction, operation and decommissioning.
- Describe the other associated infrastructure necessary for the project including site haul roads, airstrips, ports, camp and/or housing facilities.

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- Describe the types and volumes of wastes material that will be generated by the Project including effluent, sewage, gaseous, and solid refuse from the camp. A prediction of the chemical, physical, toxicological and radiological characteristics of any final discharges and any anticipated seepage should be made. The disposal methods for each type of waste should be described and alternative methods of disposal should be identified and reasons given for their rejection. Engineering drawings are required for any impoundment structures such as sedimentation ponds.
 - Describe the energy requirements for the project and the energy sources and quantities that will be used to meet these requirements. Identify the possible energy sources (i.e., connection to existing grid, diesel, etc.) that could be used. Alternative energy sources should be identified and reasons given for their rejection. Plans for energy conservation can also be outlined here.

Guidance

Government of Yukon, Health and Social Services, Environmental Health Services. Phone 867-667-8391, Fax 867-667-8332 for information on public water supplies, public health, and sewage disposal.

3.3.5.8 Access and Transportation

- Describe site access roads and airstrips including land tenure and responsible parties for operation and maintenance of the access. Map access road and airstrip locations and indicate any stream crossings. Provide drawings/designs of all site access infrastructures. Indicate whether access is seasonal or permanent.
- Describe any upgrading required on existing access routes.
- Describe supply transportation requirements to project area. Indicate quantity and types of supplies hauled. Indicate ore/concentrate transportation routes and destinations. Outline special handling and loading and emergency plans for hazardous materials.

Guidance

Land Use Guidelines; Camp and support facilities. Prepared for DIAND. Komex International Ltd., 1998.

Land Use Guidelines; Permafrost. Prepared for DIAND. Komex International Ltd., 1998

Environmental Guidelines: Pits and Quarries. Prepared for Land Resources, NAP. MacLaren Plansearch, 1982.

Land Use Guidelines Access Roads and Trails. Prepared for Land Resources, Northern Affairs Program. Hardy Associates Ltd., 1984.

Government of Yukon, Community & Transportation Services, Transportation Engineering Branch, Phone 867 633-7930, Fax 867-393-6447 for information on Yukon Highways and Transport Services Branch, Phone 867-667-3032, Fax 867-393-6220 for information on transportation of dangerous goods.

3.3.5.9 *Accidents and Malfunctions*

This section should describe the proposed emergency and contingency plans for dealing with accidents and malfunctions including:

- Fuel and other hazardous material spills;
- Spill and/or accidents on access and transportation routes;
- Accidents and malfunctions of key project components such as tailings containment area, dykes and diversions;
- Failure/breach of impoundments;
- Failures during the mining process, and;
- General emergency situations such as fire and natural disasters.

3.3.5.10 *Hazardous Materials Management*

- Describe plans for transporting, handling, storing, using and disposing of hazardous materials.

3.3.6 *Project Phases*

This section of the EAR deals with the development sequence, in the context of the entire project from construction, through closure and post-closure. The construction, operation and decommissioning phases of the project should be described as it pertains to the timing, type and scale of the project development. The discussion should focus on those activities that are time and project phase dependent.

3.3.6.1 *Project Schedule*

- Provide an expected and realistic timetable of the project by phase. Discuss any project timing constraints. Outline the scope of possible future phases of development such as ongoing exploration or expansion.

3.3.6.2 *Construction Phase*

- Describe the construction phase activities related to each major component of the project, and the associated infrastructure. Activities to address include: site preparation, earthworks (e.g., borrow pits, quarries, stream crossings, cut and fill activities), material lay down and disposal storage areas, blasting (e.g., explosives transportation, manufacturing and storage), drilling, construction, and rehabilitation (including removal of temporary services).
- For constructed engineered works (e.g. tailings impoundments, heap leach pads, waste rock dumps, sediment control dams) describe construction quality control quality assurance features.
- Provide information on workforce requirements including location, magnitude, and schedule. Outline workforce infrastructure and management. Discuss expected on-site workforce requirements and camp/housing facilities.
- Outline and describe key project and design features and construction techniques/technologies, and key management approaches/procedures.

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- Describe activities related to the use, transportation, storage and handling of supplies, especially fuels and hazardous materials on site during the construction phase.
 - Outline risk management approaches, including accident, malfunctions and emergency response measures that will be in place during construction.
 - Describe construction phase environmental monitoring plans.

3.3.6.3 *Operations Phase*

- Describe the mining operations phase in relation to each major component of the project and associated infrastructure and activities.
- Provide information on workforce requirements including location, magnitude, and schedule during the operations phase of the project. Outline workforce infrastructure and management. Discuss expected on-site workforce requirements and camp/housing facilities.
- Outline any concurrent reclamation activities and provide a plan for temporary shutdown of operations for all components of the proposed project including costing.
- Describe on-site transportation systems and communications systems.
- Provide an environmental protection plan outlining management, protection, monitoring and audit strategies. The plan should discuss risk management approaches and include discussion of responses to accidents and malfunctions as well as emergency response measures.
- Provide an environmental monitoring program to monitor various environmental attributes that may be impacted from the operation. This should include water resources, aquatic resources, wildlife monitoring, as well as physical structures monitoring programs.

3.3.6.4 *Decommissioning and Post-Decommissioning Phases*

- Describe the decommissioning plans, including overall objectives, design criteria (e.g. 200 year event), and any factors that will affect final decisions on, and implementation of, decommissioning activities.
- Describe the decommissioning studies, modeling and other activities to be carried out during operations including objectives, study methodology, reporting and schedule.
- Provide conceptual decommissioning plans for all components of the proposed project.
- Describe to the extent possible, the specific activities of the decommissioning and post-decommissioning phases. For example, their location, magnitude, schedule and workforce requirements. Include a description of proposed key technologies and processes.
- Describe proposed practices for the management of solid wastes, liquid effluents, gaseous emissions, and water use and proposed risk management approaches, including emergency response measures. Identify any options for the post-mining site use and condition of the site and its infrastructure.

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- Provide details on the plans for monitoring, assessment and maintenance during closure and post-closure.
 - Present and describe financial security requirements for closure. Decommissioning plans at a conceptual level should be costed for an estimation of mine reclamation bonding requirements. The proponent should submit a security proposal to address the liability at the site.

Guidance

DIAND's Policy on mine decommissioning and closure requires adequate financial security to be in place so that financial resources are available for closure activities at any time during operations. Contact DIAND Mineral Resources for more information.

Reclamation Practices and Research on Mineral Exploration Properties in the Yukon Territory. Prepared for DIAND Mineral Resources, by Craig, D.B., et al, 1998.

Reclaim Model Version 2.1 Mine Reclamation Cost Estimating Model: Unit Costs for Mine Reclamation Activities. Prepared for DIAND-Water Resources Division. Brodie, M.J., 1996.

Closure Design Standards for Yukon Mining Projects. Prepared for Remi Allard. Slater, B., 1994.

Mine Reclamation in Northwest Territories and Yukon. Prepared for DIAND Northern Affairs Program. Steffen, Robertson and Kirsten, 1992.

Guidelines for Reclamation/Revegetation in the Yukon, Volume II. YTG - Renewable Resources, 1998.

3.4 PROJECT ALTERNATIVES

See the Project Description guidelines for a discussion of alternative means and alternatives to the project.

3.4.1 Alternative Means of Carrying Out the Project

At the discretion of the RA(s) for screenings or as required for comprehensive studies, the EAR should address the following with respect to alternative means.

- Identify and document feasible alternative means considered for the project or for components of the project. Indicate the methodologies used for alternative selection. Selection constraints should include technical and engineering features, costs, environmental, socio-economic or cultural/heritage considerations.
- The comparison of the alternatives considered should be presented based on the above assessment. Preferred alternatives should be stated with a rationale for selection.

3.4.2 Alternatives to the Project

At the discretion of the RA(s) the EAR should:

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- Identify alternatives to the project.

Guidance

The Agency's Operational Policy Statement *Addressing Need for, Purpose of, Alternatives to and Alternative Means* (October, 1998) provides guidance in this area.

3.5 DESCRIPTION OF THE EXISTING ENVIRONMENT

As noted in the Project Description Guideline, the purpose of this section is to provide a description of the project's environmental setting. This includes the biological and physical environment, as well as those socio-economic, cultural, and other human influences that could be potentially affected by the environmental changes caused by the project. While the Project Description presented a summary of the environmental conditions, the focus of the EAR is to provide further information to expand on various components as a result of additional data collection programs.

The environmental conditions should continue to focus on the VECCs, indicators, and cultural components of importance within the study area, as well as issues identified during government, First Nations and public consultation. Basic information regarding other environmental conditions should also be summarized. The information should be presented in a concise manner with details and background information provided in appendices. The following is a listing of the environmental components that should be considered along with guidance for information requirements.

3.5.1 Biological and Physical Conditions

The following sections provide a listing of specific biophysical components that should be addressed in the EAR.

3.5.1.1 Physiography

- Describe the regional setting for the area including such key terrain features such as mountains, rivers and lakes. Identify existing infrastructure or communities.

3.5.1.2 Surficial Geology

- Provide any surficial soils mapping and identify soil types and areas of concern, including permafrost and erosion potential.
- Include a description of surficial materials such as grain size, permeability, moisture content, and density. Particular attention should be paid to the evaluation of permafrost. Characterize the spatial extent, temperature, moisture content, thickness, and stability of the material. This information is needed to assess the adequacy of surficial materials that may be used for construction purposes or as foundation materials for a physical structure.
- Pre-disturbance surficial geology information should be conducted with a view to the eventual decommissioning and reclamation of the project.

Guidance

Guidelines for Determination of Permafrost Conditions Prior to Site Development. Prepared for Exploration & Geological Services, DIAND. Burn, C. R., 1997.

Geotechnical Considerations for Northern Mining Developments. Prepared for Water Resources, NAP. Geo-Engineering (M.S.T.) Ltd., 1990.

Requirements for Project and Regional Geology, Surficial Geology, Geological Processes and Terrain Hazards. DIAND, Exploration and Geological Services and Mineral Resources. Phone 867 667 3203 Fax 867 667 3198.

3.5.1.3 *Terrain Hazards*

- Identify natural terrain features and hazards found within the project area, including slides, avalanche zones, flood hazards. Provide information on area seismology and earthquake potential (maximum credible earthquake, maximum ground accelerations associated with a 1 in 475 and 1 in 1000 year return earthquakes).

Guidance

Seismic Risk Evaluation. Prepared for Environment Directorate. Hall, M., (Amerok Geophysics), 1992.

Contact Geological Survey of Canada, Victoria Division. Phone 250 363 6433 Fax 250 363 6565, for information on seismicity and regional earthquake activity.

3.5.1.4 *Climate/Meteorological*

- Provide a description of general climatic conditions in the project area for at least one annual cycle in the drainage. Report monthly extremes, and means for temperature, precipitation and snow depth. Provide wind velocity and direction information and aspect and solar radiation.
- Outline regional analyses used to generate meteorological parameters for design purposes.

3.5.1.5 *Air Quality*

- Provide background information on existing ambient conditions and any current emissions in the project area airsheds.

3.5.1.6 *Water Resources*

A detailed description and characterization of the project's watershed, watercourses and drainages is required. Hydrology and water quality data collected by government agencies at various sites within the general region may aid in the interpretation of site specific data and provide a foundation for comparisons to be made.

Hydrology

- Provide a detailed hydrological characterization of the project area, including peak and minimum runoff for a specified return period.
- Determine runoff hydrology for the affected catchment basin(s) using measured data acquired from designated metering sites.
- Outline regional analysis used to generate hydrological parameters for design purposes.

Guidance

DIAND Water Resources Division. Phone 867-667-3147, Fax 867-667-3195 for hydrological information.

Water Survey of Canada. Phone 867-668-2161, Fax 867-668-3948 for hydrological information.

Channel Morphology and Typology. In *The River Handbook: Hydrological and Ecological Principles*. C. Callow and G. Petts (editors) Basil Blackwell, Oxford, UK. Pp. 126-143. Church, M., 1992.

Water Quality

- Provide baseline water quality data including water column, sediment, riparian ecosystem, water supply, and receiving environment information.
- Include any assessment of groundwater quality.
- Interpret water quality data for seasonal variability and range of key project water quality variables. Provide baseline values for substances which will be modified by the project (construction, operation, decommissioning).

Guidance

Standard Methods for the Examination of Water and Wastewater, 20th Edition. American Public Health Association, American Water Works Association, Water Pollution Control Federation. 1999.

Biological Sampling Manual. Water Quality Branch, Ministry of Environment, Lands and Parks, Victoria, B.C. Cavanagh, N., R.N. Nordin and P.D. Warrington, 1994.

DIAND Water Resources Division. Phone 867-667-3147, Fax 867-667-3195.

Environment Canada, Environmental Protection. Phone 867-667-3400, Fax 867-667-7962.

Hydrogeology

- Provide a description of the geological elements and processes that affect the hydrology of the project area watersheds.

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- Provide supporting data to characterize.
 - Characterize the groundwater regime of the area, depth to groundwater and regional groundwater flow patterns.

3.5.1.7 Aquatic Resources

A detailed description and characterization of the aquatic resources in the project area affected drainages is required.

Fish Resources

- Include information and baseline data on study methods, riparian habitat surveys, fish sampling, and results of other fieldwork within affected drainages.
- Analysis of the fish capture data should be undertaken to delineate species abundance and spatial and temporal distribution.
- Document critical and sensitive habitats, spawning periods and locations, rare and/or endangered species and habitats.
- Provide 1:50 000 map(s) of fisheries resource(s).

Guidance

Chapter 7, *Active Fish Capture Methods*. In: *Fisheries Techniques*. Nielson, L.A. and Johnson, D.L. editors, American Fisheries Society. Southern Printing Company Inc, Blacksburg, Virginia. Jearld, Jr., A., 1983.

Reconnaissance (1:20 000) - Fish and Fish Habitat Inventory: Standards and Procedures. Resources Inventory Committee Manual. B.C. Ministry of Environment, Lands and Parks, Victoria, B.C. Province of British Columbia, 1998.

Fish Collection Methods and Standards. Resources Inventory Committee Manual. B.C. Ministry of Environment, Lands and Parks, Victoria, B.C. Province of British Columbia, 1997.

Contact: Fisheries & Oceans Canada. Phone 867-393-6730, Fax 867-393-6783 and

Yukon Government, Renewable Resources, Fisheries Management. Phone 867-667-5117,

Fax 867-393-6263 for information on fisheries resources.

Benthic Invertebrates

- Provide results of sampling with a summary of inventory including species abundance and spatial distribution.

Guidance

Study Design and Data Analysis in Benthic Macroinvertebrate Assessments of Freshwater Ecosystems Using a Reference Site Approach. Prepared for the Ninth Annual Technical Information Workshop, Kalispell, Montana. Bailey, R.C., Norris, R.H., Reynoldson, T.B. 1996.

Freshwater Biomonitoring and Benthic Macroinvertebrates. Chapman and Hall, New York, NY. 488 pp. Rosenberg, D.M. and Resh, V.H. (eds.), 1993.

Guidelines for Monitoring Benthos in Freshwater Environments, Environment Canada, 1993.

Guidelines for the processing and quality assurance of benthic invertebrate samples collected as part of the National Water-Quality Assessment Program. Open-File Report 93-407. U.S. Geological Survey, 1993.

Environment Canada, Environmental Protection. Phone 867-667-3400, Fax 867-667-7962

Periphyton

- Provide results of sampling and collected baseline data, describing sampling sites, and determining taxonomy, biomass, chlorophyll concentration.

Guidance

Needham, J.G., Needham, P.R. , 1962. *A Guide to the Study of Fresh-Water Biology.*

Environment Canada, Environmental Protection. Phone 867-667-3400, Fax 867-667-3962

Stream Sediments

- Provide information describing the geological and chemical characteristics of stream bed sediments (grain size and metals analysis).

Guidance

Environment Canada. December, 1994. *Environmental Protection Series – Guidance Document on the Collection and Preparation of Sediments for Physico Chemical Characterization and Biological Testing,* Report EPS 1/RM/29.

Environment Canada, Environmental Protection. Phone 867-667-3400, Fax 867-667-3962

3.5.1.8 Terrestrial Resources**Soils**

- Include terrain mapping details, soil classification, and erosion potential. Descriptions should also include consideration of attributes that influence or facilitate runoff, such as infiltration

and rates of percolation, slope, aspect, vegetation, presence of and extent of permafrost and thickness of the active layer.

Vegetation

- Provide information on study methodology, results of vegetation cover and biogeoclimatic classification including any identified rare and/or endangered species and ecological reserves. Description level should be of such quality that an assessment can be conducted as to whether key habitat for important wildlife species is present in the project area.
- Provide information on forest cover and land capability, including stand types and characteristics, and approximate volume/density estimates.
- Pre-development plant communities existing on sites that may be disturbed as a result of development should be documented to the species level and note made of the site and community characteristics so that efficient and suitable selection of species for reclamation may be achieved.

Wildlife

- Describe major wildlife species abundance and distribution within the project area, including mammalian fauna, amphibians, and reptiles (which may include rare and/or endangered species).
- Identify and describe critical/key and sensitive habitats and periods of habitat use in the project area.
- Identify those species that reflect a general level of public and government awareness and concern (Valued Ecosystem and Cultural Components or VECCs) on the basis of perceived intrinsic value, economic importance, traditional use, recreational value, rarity, and sensitivity.
- Identify any additional or ongoing studies or monitoring programs.

Guidance

Government of Yukon, Renewable Resources. Phone 867-667-5409, Fax 867-667-3641

DIAND, Forest Resources, Phone 867-667-3350, Fax 867-667-3138

3.5.2 Socio-Economic Conditions

CEAA requires that only those socio-economic matters which are affected as a result of a change to the environment caused by the project be considered. The EAR should provide a description of the current land use, economic and social settings within the project area. This information should focus on communities likely to be impacted as a result of project activities.

3.5.2.1 Human Health (physical, psychological, emotional, spiritual or mental health and well being)

- Provide general information on human health conditions that may be affected by the project.

Guidance

Yukon Government, Environmental Health Services, Phone 867-667-8391, Fax 867-667-8322

3.5.2.2 Socio-economic Conditions

Provide the following information on communities that may be affected by the project.

- Community Demographics (population size, distribution and composition)
- Quality of life
 - Education
 - Community/social cohesion (family breakup, living stability, public trust, social ties, volunteerism, etc.)
 - Crime
 - Spiritual (religious/spiritual life)
 - Level of satisfaction with community life
- Economy
 - Economic base (economic sectors and contribution to local economy)
 - Employment (labour force, unemployment rate, labour skills)
 - Income (local and territorial income patterns)
 - Business development (local businesses)
- Recreational opportunities or amenities
- Home life or personal security
- Future land uses
- Future use or future production of commercial species

Guidance

Regional Economic and Social Impact Assessment. Environmental Impact Assessment Review 10: 25-36. McDonald, G. 1990.

Responsible Authorities Guide for the CEAA, FEARO, 1994.

Contact Yukon Government, Economic Development. Phone 867-667-5471, Fax 867-667-8601

Contact Yukon Government, Bureau of Statistics. Phone 867-667-5640, Fax 867-393-6203

Contact Yukon Government, Community & Transportation Services. Municipal & Community, Phone 867-667-5486, Fax 867-393-6258

Provide the following information on the area potentially affected by the project. Indicate and identify the information on maps (where possible).

-
- Land tenure and designation (leases, ownership, mining claims, settlement land, Parks, land use plans, special management zones, etc.)
 - Physical infrastructure (roads, trails, powerlines, communications lines, habitations, cabins, camps, campgrounds, facilities or other structures)
 - Current and future land and resource uses – both commercial and recreational, non-aboriginal use:
 - Recreational activities (fishing, hunting, gathering, hiking)
 - Trapping concessions. Identify all registered trapping concession holders affected by the project. Discuss the frequency, intensity, and location of trapping activities in the area.
 - Forestry. Identify all forest management and/or timber harvesting activities in the area such as cut blocks or access roads, permitted or otherwise.
 - Farming.
 - Fisheries. Provide information on cultural, subsistence and commercial fishing activities.
 - Commercial wilderness activities (including guided fishing, outfitting, hunting, and other tourism activities as applicable).
 - Mineral and oil and gas activity.

Guidance

Contact various specialist departments for information on local land use activities.

Contact local First Nations or DIAND for information on settlement lands.

3.5.2.3 Physical and Cultural Heritage

- Identify archaeological, paleontological and historical resources on lands that will be affected by the project.

Guidance

Yukon Government, Heritage Branch. Phone 867-667-5983, Fax 867-667-8007

B.C. Government historic resource impact assessment procedures. (See www.heritage.gov.bc.ca/arch/pubs/archpubs.htm.)

3.5.2.4 Current Land and Resource Use for Traditional Use

- Provide information on current land use and resource use for traditional purposes by aboriginal persons.

Guidance

Contact Local First Nations or DIAND.

3.5.3 Valued Ecosystem and Cultural Components (VECCs)

See the *Project Description guidelines* for a discussion of VECCs.

- Present the selected list of expected VECCs for the project and the methodology and rationale used for selection. Provide any further information on VECCs especially if more have been identified.
- Describe how Traditional Knowledge was used in the determination of VECCs.

3.5.4 Relationships between Environmental, Socio-Economic and Cultural Components

- Identify the key environmental relationships that may be affected by the project. Effort should focus on those environmental components identified as being most important according to the issues and concerns raised by stakeholders.

3.5.5 Sensitivity to Disturbance

- Describe the sensitivity of each environmental component to the various project activities.
- Document the methods used to define sensitivity.

3.6 ENVIRONMENTAL EFFECTS ASSESSMENT

This section is key to the EAR, as it includes predictions of environmental and directly related socio-economic effects of the project. The basic steps involved in assessing environmental effects were presented in Section 2.5. Generally these steps involve describing the project and environmental conditions, identifying VECCs, and defining the project and assessment scope. The proponent and the RA should work co-operatively to determine VECCs and scope of project and assessment. Once the project is defined, project environmental interactions can be identified and analysed. Section 2.5 discussed various methodologies used in an EA. Mitigation measures should be presented to address environmental effects and residual effects fully described. The EAR should then evaluate and determine the significance and likelihood of the expected residual effects and should propose an overall conclusion to the EA.

The methodology used to assess environmental and directly related socio-economic effects should be described. Methods should be transparent, scientifically defensible and should address the legislated requirements of CEAA.

3.6.1 Project and Assessment Scope

The final project and assessment scoping for the EAR should be based on discussions with the RA(s). It is the responsibility of the RA(s) to determine the scope of the project and the scope of the EA. The reader is referred to the *Project Description guidelines* for a discussion of project and assessment scope.

3.6.1.1 Scope of the Project

The scope of the project should be defined in the *Project Description*, however the EAR should incorporate any modifications and additions to the scope of the project.

- Present the agreed upon scope of the project as determined by the RA(s).

3.6.1.2 *Scope of the Assessment*

The scope of assessment should be defined in the Project Description, however the EAR should recognize any refinements to the assessment scope.

- Present the agreed upon scope of assessment as determined by the RA (s) including:
 - Temporal and spatial boundaries (which may differ for each VECC), and
 - Scope of cumulative effects assessment including temporal and spatial boundaries.

3.6.2 *Public Consultation*

Refer to the Project Description section for guidance on conducting public consultations. This section should describe the public consultation program and its results.

- Describe the consultation methods used to identify, inform and solicit input from potentially interested parties. Identify who provided input and their key concerns. Outline similarities or differences in perceived viewpoints.
- Describe how First Nations were consulted and how their specific concerns, issues and comments were identified and incorporated into the EA.
- Describe how First Nation's Traditional Ecological Knowledge was sought and integrated it into the EA.
- Describe and discuss how public comments or concerns relating to the project and its environmental effects were identified and integrated into the EA. For issues not addressed in the EA, the proponent should provide details on why a particular issue or issues were not dealt with.

3.6.3 *Predicted Environmental Effects of the Proposed Project*

The EAR will provide a comprehensive analysis of the potential short and long-term effects of the project, including malfunctions and accidents, on the physical, biological, socio-economic and cultural components as identified in Section 3.5. A discussion of how the environment may affect the project should also be included. This section of the report should also address issues identified in the consultations to date. Additionally comments, concerns and issues raised during the review of the Project Description should be addressed.

3.6.3.1 *Methods used to Predict Effects*

- Describe the methods used to predict the potential effects of the project on the components identified in Section 3.5. The methods used should be transparent, scientifically defensible and address the legislated requirements of CEAA.

3.6.3.2 *Effects on the Environmental Components*

- Describe the predicted project effects on the environmental components with attention focused on VECCs. The assessment should include all project phases including construction, operation, decommissioning and post decommissioning.
- The effects assessment should incorporate comments, issues and concerns raised during consultation and review of the Project Description.

3.6.3.3 *Effects of Environmental Changes on Human Health*

- Describe the predicted effects of the environmental changes resulting from the project on human health.

3.6.3.4 *Effects of Environmental Changes on Socio-economic Conditions*

- Describe the predicted effects of the environmental changes resulting from the project on socio-economic conditions. Effects on socio-economic conditions include effects at the population or community level on:
 - The quality of life or “way of life”;
 - The economy, commercial opportunities, or employment;
 - The availability of recreational opportunities or amenities;
 - Homelife or personal security;
 - Future land uses; and,
 - The future use or production of commercial and/or subsistence species or resources.

3.6.3.5 *Effects of Environmental Changes on Physical and Cultural Heritage*

- Describe the predicted effects of the environmental changes resulting from the project on physical and cultural heritage.

3.6.3.6 *Effects of the Environment on the Project*

- Describe the predicted effects of the environment on the project including those identified in Section 3.5.

3.6.4 *Cumulative Effects Assessment*

The intent of the cumulative effects assessment (CEA) is to assess potential environmental effects that are likely to result from the proposed project in combination with other past, existing and future projects or activities that have been or will be carried out. The cumulative effects must result at least in part from the project being proposed, and only those environmental effects of the project which interact or accumulate with effects from other projects or activities are to be included as potential cumulative effects. The CEA should focus on the environmental effects on VECCs due to interactions with other projects or activities.

In the case of future projects or activities, there must be reasonable certainty of occurrence. Therefore, the cumulative effects assessment should include all certain and all reasonably foreseeable projects. Reasonably foreseeable projects include those that have entered the assessment process under CEAA, those where a permit or licence has been issued, and those where binding commitments have been made by governments.

The EAR should:

- Describe the activities of the other projects identified in the scoping of CEA and indicate the environmental effects that are expected.
- Describe the predicted environmental effects of the project in the context of the other projects past, present and future.
- Document the sources of information used to identify other projects, and if possible, briefly describe the methods used to determine the environmental effects of these other projects.

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- Predict cumulative environmental effects.
 - Identify mitigation measures for the cumulative environmental effects.
 - Evaluate the significance of residual cumulative environmental effects including comparison against thresholds or land or resource use objectives.
 - Recommend follow-up monitoring activities or future management options.

Guidance

Cumulative Effects Assessment Practitioners Guide (AXYS, 1999).

A Reference Guide for the CEEA Addressing Cumulative Environmental Effects (FEARO, 1994).

Thresholds for Addressing Cumulative Effects on Terrestrial and Avian Wildlife in the Yukon Territory (March, 2001). Prepared by AXYS Environmental Consulting for DIAND and Environment Canada.

3.6.5 Mitigation Measures

This section should summarize and provide options, plans or measures to avoid, reduce, control or eliminate adverse environmental effects including cumulative environmental effects. Mitigation may include restitution for environmental damage such as replacement, restoration, compensation, or other appropriate means.

Identification of adverse environmental effects from project components or undertakings is conducted as early as possible in the assessment process. Proponents then identify mitigation measures to address the adverse environmental effects. The residual effects which may still occur after mitigation has been implemented are then assessed for their significance (Section 3.6.7).

Mitigation measures are part of the project design, defined early in the planning stages of a project. They may be refined throughout the assessment process as adverse environmental effects are clarified or in response to comments from RA(s), specialist advisors, First Nations, public and other interested parties. Mitigation measures are often part of the industry's code of good practice, standards or environmental policies, and can include plans for areas such as water management, waste management, monitoring or decommissioning.

- Describe the mitigation proposed for the adverse environmental effects of the proposed project including mitigation of cumulative environmental effects. Mitigation should deal with all phases including construction, operation and decommissioning. Include a brief description of strategies, methodologies, schedules and plans for construction, operation and decommissioning and reclamation.
- Describe restitution measures that will be used where damage to the environment cannot be avoided. This should include a description of commitments, approaches and specific options for restoration, replacement and/or compensation for any potential/predicted environmental damage.

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- Describe contingency measures for accidents, failures and malfunctions including methods for reducing the likelihood of accidents and malfunctions.
 - Describe health and safety programs for workers, the public and wildlife.
 - Describe material handling for hazardous materials or dangerous goods and provide any contingency plans for hazardous materials, particularly fuels and reagents or chemicals.
 - Present and describe any proposed environmental management systems, adaptive management plans, and environmental protection plans or programs.
 - Present and describe any proposed monitoring programs. Include programs for construction monitoring and environmental monitoring (water quality, hydrology, aquatic resources, wildlife, etc). Indicate any required long-term monitoring requirements.

3.6.6 *Determination of Residual Effects*

Residual effects are adverse environmental effects that remain after the implementation of mitigation measures.

- Describe residual effects in the same terms as the original effects. Any assumptions or uncertainty surrounding the implementation and effectiveness of mitigation measures, including the prediction of residual effects, should be explicitly outlined.

3.6.7 *Determination of Significance of Environmental Effects*

The RA(s) for a project are responsible for making a determination on the significance and likelihood of residual effects. However, the proponent is encouraged to conduct an analysis of significance and likelihood as part of the EAR. The methodology for determining significance and likelihood of effects, after mitigation, should be clearly defined, as the RA(s) will analyse the process and rationale used when making their significance determination. A discussion of the important components for determining the significance and likelihood of adverse environmental effects is provided in Section 2.5.7. The iterative process of EA allows for the modification of existing and/or implementation of additional mitigation measures to reduce any significant environmental effects identified.

- Develop significance criteria in relation to the type of effect, the probability of occurrence, the magnitude of the effect (e.g., proportion of a species affected), and its geographic extent, frequency, duration, and reversibility. Ecological context is critical to the determination of significance, since regions that have already been adversely affected by human activity, or are for other reasons ecologically vulnerable, will have less resilience to imposed stresses.
- Provide an analysis of the significance of the adverse residual effects including information on the methods used to assess significance. The methodology description should address both the process (e.g., professional judgment, public consultation, expert advisors) and the criteria for significance.

The likelihood of the residual adverse significant effects should be determined by indicating the probability of occurrence and the degree of uncertainty or certainty surrounding predictions of effects.

- Describe the set of standards used in the assessment.

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- Indicate the level of confidence associated with each assessment.
 - Describe possible effects on people and communities associated with the predicted environmental effects, including impacts on:
 - Human health (physical, psychological, spiritual);
 - Socio-economic conditions (e.g., quality of life, current and future commercial opportunities, employment, current land and resource use); and,
 - Physical and cultural heritage (e.g., archeological and spiritual sites).
 - Where damage to the environment will not be completely avoided, restitution measures should be presented.
 - Provide a description, in a manner similar to mitigation measures, of commitments, approaches and specific options for restoration, replacement, and/or compensation for any potential/predicted environmental damage. For example, these could include programs to promote socio-economic benefits, such as those relating to training, workplace orientation, and contracting and procurement.

Guidance

Refer to the Agency's Reference Guides to the CEEA *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects* (November 1994) *Assessing Environmental Effects on Physical and Cultural Heritage Resources* (April, 1996) and for further guidance.

3.6.8 Follow Up Program

Under CEEA, the need for and the requirements of any follow-up program are at the discretion of the RA(s) for screenings. Follow-up is mandatory for comprehensive studies. As noted in the "Cumulative Effects Assessment Practitioner's Guide" (AXYS, 1999), the purpose of follow up programs is to:

- Test the accuracy of impact predictions and the value of recommended mitigation measure;
- Determine effectiveness of mitigation measures and the need for modification to those measures to ensure impact predictions remain valid
- Identify unexpected environmental problems
- Implement additional mitigation measures as monitoring requirements are needed, which may derive from both regulatory requirements (permit system compliance monitoring) and from the EA process.

3.6.8.1 Methods and Program Components

- Provide a description of the physical, chemical and biotic parameters to be monitored (these can be linked to the selected environmental indicators), the sampling program and a description of monitoring and analytical methods and technologies (including quality

assurance/quality control). Include monitoring site descriptions, locations and the sampling and reporting frequency.

- Provide a description of the approach to implementing the monitoring program including roles and responsibilities, community involvement and mechanisms to compile, interpret, report and maintain data/information.
- Provide a description of the triggers or indicators to be used for implementing any additional remedial measures and indicate the responsible authorities and mechanisms for implementing these measures.
- Provide a description of how monitoring results will be applied to evaluate EA effectiveness.
- In developing follow-up programs, attention should be given to how traditional ecological knowledge can be applied, and how knowledgeable aboriginal and other local people can be involved in implementation.
- Describe how the proposed programs will meet requirements of other legislation and associated regulations such as the *Metal Mining Liquid Effluent Regulations* issued under the Fisheries Act.

3.7 SUPPORTING INFORMATION

This section should include a list of references used in the EAR and any supporting data, reports or other information that is used to document project information and support assessment conclusions. The information should be referenced as appendices.

4 GLOSSARY AND DEFINITIONS

Glossary

Acronyms used in this guidance document include:

Agency	Canadian Environmental Assessment Agency
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Act
CS	Comprehensive Study
CSR	Comprehensive Study Report
DAP	Development Assessment Process
DIAND	Department of Indian Affairs & Northern Development
EAR	Environmental Assessment Report
EARP	Environmental Assessment and Review Process
EIS	Environmental Impact Statement
EA	Environmental Assessment
FA	Federal Authority
FEARO	Federal Environmental Assessment Review Office
IEE	Initial Environmental Evaluation
RA	Responsible Authority
RERC	Regional Environmental Review Committee
VECCs	Valued Ecosystem Cultural Components

4.1 DEFINITIONS

The following definitions provide additional guidance to proponents on some of the terminology used in the Guidelines. Definitions in italics are from the Canadian Environmental Assessment Act. The Responsible Authorities Guide to the CEEA, FEARO, 1994 and the Cumulative Effects Practitioners Guide, CEEA, 1999, were used as sources for various definitions.

Action	any project or activity of human origin.
Activity	any action that is not a physical work. Activities do not involve the construction of an object and may lead to an environmental effect (i.e. a highway is a physical work, but traffic on the highway is an activity).
Agency	the Canadian Environmental Assessment Agency, established by Section 61 (also known as the CEA Agency). (Replaced Federal Environmental Assessment Review Office).
Alienation	an effect on biological species due to sensory disturbance (e.g., noise, light, smell).
Alternative Means	methods of a similar technical character or methods that are functionally the same; “alternative means” with respect to a nuclear power plant, for example, includes selecting a different location, building several smaller plants, and expanding an existing nuclear plant.
Alternatives to a Project	functionally different ways of achieving the same end; for example, “alternatives to” a nuclear power plant include importing power, building a hydroelectric dam, conserving energy, and obtaining the energy through renewable resources.
Baseline Information	a description of existing environmental, social and economic conditions at and surrounding a project.
Canadian Environmental Assessment Act (CEAA)	An Act to establish a federal Environmental assessment process (replaces EARP Guidelines Order).
Cause-effect Relationship	the connection between an action’s disturbance (cause) and its effect on the environment.
Class screenings	environmental assessment criteria approved by the Agency directing the required environmental assessment activities for any grouping/class of activities that are similar in nature, routine or repetitive and have known and mitigatable environmental effects.
Combined Effects	the effects that arise due to various components of the same

	Project.
Comprehensive study	an environmental assessment pursuant to Section 21 of CEAA; it includes a consideration of the factors required to be considered under subsections 16(1) and (2).
Comprehensive Study List	a list of all projects or classes of projects that have been prescribed pursuant to regulations made under paragraph 59(d); the regulation sets out types of projects likely to have significant adverse environmental effects and having additional assessment requirements than screenings.
Comprehensive Study Report	a report that summarizes the results of a comprehensive study.
COSEWIC	Committee On the Status of Endangered Wildlife in Canada. This Committee determines the national status of wild Canadian species, subspecies and populations suspected of being at risk.
Cumulative Effects Assessment	an assessment of the incremental effects of a project on the environment when the effects are combined with those from other existing and future projects. The combined effect from project interactions may be greater than the effect observed only from each project in isolation.
Cumulative Environmental Effects	effects on the environment, over a certain period of time and distance, resulting from effects of a project when combined with those of other past, existing and imminent projects and activities.
Decommissioning	restoration work to minimize the ongoing adverse environmental effects of a project, or project component, that is no longer required.
Direct Effect	an effect in which the cause-effect relationship has no intermediary effects.
Direction	the degree to which an effect on a valued environmental component will worsen or improve as the project proceeds.
Duration	the period of time during which an activity may cause a disturbance to a VECC.
EA Track	the form of environmental assessment of a project must undergo, whether a screening, comprehensive study, mediation, or panel review.
Effect	See Environmental Effect.
Environment	the components of the Earth, and includes;

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- (a) land, water, and air, including all layers of the atmosphere;
 - (b) all organic and inorganic matter and living organisms; and
 - (c) the interacting natural systems that include components referred to above.

Environmental Assessment (EA) in respect of a project, an assessment of the environmental effects of the project that is conducted in accordance with this Act and the regulations.

A systematic process to evaluate the environmental implications of a proposal or project and propose mitigation. The environmental assessment should be completed as early as possible in planning a project or proposal.

Environmental Assessment Review Process (EARP) Cabinet Guidelines Order to implement the federal policy on environmental assessment and review (replaced by CEAA).

Environmental Components Fundamental elements of the natural environment. Components usually includes: air, water, soils, terrain, vegetation, wildlife, fish, and avifauna.

Environmental Effect

- (a) any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and
- (b) any change to the project that may be caused by the environment, whether such change occurs within or outside Canada.

Environmental Protection Plan a description of what will be done to minimize effects before, during, and after project construction and operation. This includes protection of the environment and mitigation of effects from project activities.

Exclusion List a list of all projects or classes or projects that have been prescribed pursuant to regulations made under paragraph 59(c); the regulation describes those undertakings in relation to physical works that do not require an environmental assessment because the effects of the project are insignificant.

Expert Federal Department any federal authority with specialist or expert information or knowledge regarding a project.

Federal Authority

- (a) a Minister of the Crown in right of Canada;
- (b) an agency of the Government of Canada or other body

	<p>established by or pursuant to an Act of Parliament that that is ultimately accountable through a Minister of the Crown in right of Canada to Parliament for the conduct of its affairs;</p> <p>(c) any department or departmental corporation set out in Schedule I or II to the Financial Administration Act, and</p> <p>any other body that is prescribed pursuant to regulations made under paragraph 59(e),...</p> <p><i>but does not include the Commissioner in Council or any agency or body of the Yukon Territory or the Northwest Territories, a council of the band within the meaning of the Indian Act, the Hamilton Harbour Commissioners constituted pursuant to The Hamilton Harbour Commissioner's Act, 1911, a harbour commission established pursuant to the Harbour Commissions Act or a Crown corporation within the meaning of the Financial Administration Act.</i></p>
Federal Support for a Project	the federal power, duty or function that a federal authority exercises or performs in relation to the project, including acting as the proponent, or providing financial support, an interest in federal lands, or a federal permit or licence.
Follow-up Program	<p>a program for:</p> <p>(a) verifying the accuracy of the environmental assessment of a project; and</p> <p>(b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.</p>
Frequency	the number of occurrences of an event within a specific period of time.
Impact Statement	the description of a suspected cause-effect relationship through the use of a formal scientific hypothesis.
Inclusion List	a regulation which contains physical activities and physical activities not relating to physical works for which an environmental assessment is required.
Indicators	anything that is used to measure the condition of something of interest. Indicators are often used as variables in the modeling of changes in complex environmental systems.
Indirect Effect	an effect in which the cause-effect relationship (e.g., between the project's impacts and the ultimate effect on a VECC) has intermediary effects.
Interactions	an action or influence resulting from the mutual relationship between two or more impacts or an impact and a valued

	component.
Law List	a regulation setting out the statutory and regulatory provisions which require an environmental assessment.
Lead RA	where the same project has two or more RA's, one of the RA's may be designated as the lead for purposes of conducting the EA.
Likelihood	the degree of certainty of an event occurring. Likelihood can be stated as a probability.
Magnitude	the portion of the VECC that may be affected by the activity; a measure of how adverse or beneficial an effect may be.
Matrix	a tool to analyze project environment interactions and identify potential effects.
Mediator	the individual appointed by the Minister to conduct an environmental assessment by means of a mediation.
Mediation	the environmental assessment conducted with the assistance of a mediator appointed pursuant to section 30 and that includes a consideration of the factors outlined in subsections 16 (1) and (2).
Minister	Minister of the Environment.
Mitigation	in respect of a project, the elimination, reduction, or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means.
Monitoring	a continuing assessment of conditions at and surrounding the project. This determines if effects occur as predicted, and if mitigation measures are as effective as predicted.
Panel	an Environmental Assessment Panel that conducts the public review of a project or proposal.
Panel Review	an environmental assessment conducted by a review panel established pursuant to sections 33 and that includes consideration of the factors required under subsections 16 (1) and (2).
Physical Activity	any proposed activity not relating to a physical work (a fixed, constructed thing) that is listed in the Inclusion List Regulations and requires an assessment.
Physical Work	any proposed construction, operation, modification,

decommissioning, abandonment or other undertaking in relation to a physical work (when something is a fixed, physical thing which has been or will be constructed).

Project

In relation to a physical work, any proposed construction, operation, modification, decommissioning, abandonment, or other undertaking in relation to that physical work; or any proposed physical activity not relating to a physical work that is prescribed or is within a class of physical activities that is prescribed pursuant to regulations made under paragraph 59(b).

Project Footprint

the area of land or water directly occupied by the project.

Proponent

the person, body, federal authority, or government that proposes the project.

Public Registry

a system for providing convenient public access to documents relating to an environmental assessment.

Public Review

for the purpose of this guide only, an environmental assessment by means of a mediation or panel review.

Record

includes any correspondence, memorandum, book, plan, map, drawing, diagram, pictorial or graphic work, photograph, film, microfilm, sound recording, videotape, machine-readable record, and any other documentary material, regardless of physical form or characteristics, and any copy thereof.

Reclamation

The process of transforming mine land into usable conditions to suit the post-mining land use requirements.

Recovery

the return of environmental conditions to the state they were prior to the project.

Remediation (or remedial measures)

the removal, treatment, destruction or containment of soils, sediments, wastes, ground water or surface waters contaminated by hazardous substances.

Residual Impacts (Effects)

adverse predicted environmental effects that remain after mitigation measures have been applied. They represent the environmental costs of implementing a proposal.

Responsible Authority

in relation to a project, a federal authority that is required pursuant to subsection 11(1) to ensure that an environmental assessment of the project is conducted.

Scope

the limits of the environmental assessment. This focuses the analysis on relevant issues and concerns.

Scope of the Assessment	a determination of: the environmental effects to be addressed; the scope of the environmental effects to be assessed; and the effects to be considered in making decisions regarding the project.
Scope of the Project	those components of the proposed development that should be considered part of the project for the purposes of the EA.
Scoping	a consultative process for identifying and possibly reducing the number of items (e.g., issues, VECCs) to be examined until only the most important items remain for detailed assessment. Scoping ensures that assessment effort will not be expended in the examination of trivial effects.
Screening	an environmental assessment conducted pursuant to section 8 that includes a consideration of the factors set out in subsection 16(1).
Screening Report	a report that summarizes the results of a screening.
Significance	a measure of how adverse an effect may be. Significance is typically determined by asking: 1) is the effect likely to occur, 2) is the magnitude of the effect unacceptable, 3) is the effect permanent, and 4) how long before recovery may occur?
Spatial Boundaries	the area examined in the assessment.
Study Area	the geographic limits within which an impact to a valued ecosystem is likely to occur.
Sustainable Development	development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.
Temporal Boundaries	the period of time examined in the assessment.
Threshold	a limit of tolerance of a VECC to an effect, that if exceeded, results in an adverse response by that VECC.
Traditional Ecological Knowledge (TEK)	a body of knowledge build up by a group of people through generations of living in close contact with nature.
Trigger	an action by a federal authority that triggers or initiates the need for an environmental assessment; that is, one or more of the following duties, powers, or functions in relation to a project: <ul style="list-style-type: none"> • proposes the project; • grants money or other financial assistance to a project; • grants an interest in land for a project; or

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- exercises a regulatory duty in relation to a project, such as issuing a permit or licence, that is included in the Law List prescribed in the CEAA's regulations.

**Valued Ecosystem
Cultural Components**

environmental components having scientific, social, cultural, economic or aesthetic value. Any part of the environment or human society that is considered important by the public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern.

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