DRAFT GUIDELINES FOR THE PREPARATION OF THE ENVIRONMENTAL IMPACT STATEMENT FOR THE WHITES POINT QUARRY AND MARINE TERMINAL PROJECT

NOVEMBER 2004

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DRAFT GUIDELINES FOR THE PREPARATION OF THE ENVIRONMENTAL IMPACT STATEMENT OF THE PROPOSED WHITES POINT QUARRY AND MARINE TERMINAL PROJECT

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PART I INTRODUCTION

Part I of the Draft Environmental Impact Statement (EIS) Guidelines introduces the overall scope and intent of the joint review process as applied to the preparation of the EIS.

1.0 PURPOSE OF THE EIS GUIDELINES

A joint review panel (the Panel) has been established by the Minister of the Environment, Canada under the authority of the *Canadian Environmental Assessment Act* and by the Minister of Environment and Labour, Nova Scotia under the authority of the Nova Scotia *Environment Act* to consider the environmental effects associated with the Whites Point Quarry and Marine Terminal project (the Project) proposed by Bilcon of Nova Scotia, Corporation (the Proponent).

The Proponent is proposing to construct and operate a basalt quarry, processing facility and marine terminal located on Digby Neck in Digby County, Nova Scotia.

Quarrying is expected to take place on 120 hectares of land, with production expected to be 2 million tonnes of aggregate per year. Approximately 4 hectares of new quarry would be opened each year. The land-based quarry operations are expected to be year-round, with aggregate stockpiled for ship loading once per week. Drilling and blasting of basalt rock, loading, hauling, crushing, screening, washing and stockpiling would be done on-site.

Land-based permanent structures would include rock crushers, screens, closed circuit wash facilities, conveyers, load out tunnel, support structures and environmental control structures. Associated construction processes would include the erection of on-land aggregate processing equipment, conveyers and wash-water pumping systems.

Marine facilities would include a conveyor, ship loader, berthing dolphins and mooring buoys. Construction processes for the marine terminal infrastructure would include the anchoring of pile support structures to the basalt rock extending offshore, as well as the construction of concrete caps as dolphins. Approximately 40,000 tonnes of aggregate would be produced for loading each week.

This document contains the draft Guidelines to be used by the Proponent for the preparation of the EIS for the Project. The factors to be considered in the EIS are defined in the "Agreement Concerning the Establishment of a Joint Review Panel for the Whites Point Quarry and Marine Terminal Project Between The Minister of the Environment, Canada and The Minister of Environment and Labour, Nova Scotia" (the Agreement).

1.1 Preparation and Review of the EIS

The EIS Guidelines establish the issues that the Proponent must address in the EIS, how to describe and assess these issues, and how to structure the EIS. While the EIS Guidelines provide a framework for preparing a complete and accessible EIS, it is the responsibility of the Proponent to provide sufficient data and analysis to allow evaluation of the potential adverse environmental effects of the Project by the Panel, the public, and technical and regulatory agencies.

The Proponent will prepare an EIS that addresses the requirements of the EIS Guidelines for submission to the Panel. The Panel will then make the EIS available to the public and stakeholders, and will receive comments during a review period of not less than 60 days, to determine whether additional information must be provided before convening public hearings. Comments made by the public or stakeholders pursuant to the review shall be filed in writing with the Panel. Written comments received pursuant to the public review shall be immediately provided to the Proponent by the Panel. The Proponent shall, as appropriate, provide to the Panel its response to the written comments not later than fifteen (15) days following completion of the period for public examination and comment. Should the Panel identify deficiencies after reviewing the EIS, and in consideration of any comments received from the public, stakeholders or the Proponent, the Panel may require additional information from the Proponent. Any request for additional information shall be issued within fifteen (15) days following the expiration of the period for public examination and comment or fifteen (15) days following receipt of the Proponent's response to the written comments from the Public, whichever occurs later.

The Panel shall schedule and announce the start of public hearings once the Panel is satisfied that sufficient information has been provided. A minimum of thirty (30) days public notice will be provided prior to the start of the hearings.

1.2 Panel Report

As required in clauses 6.2 and 6.3 of the Agreement, following public hearings, the Panel will prepare and submit a report to the provincial Minister of Environment and Labour and the federal Minister of the Environment that includes recommendations on all factors set out in section 16 of the *Canadian Environmental Assessment Act* and, pursuant to Part IV of the Nova Scotia *Environment Act*, recommend either the approval, including mitigation measures, or rejection of the Project. As prescribed in the Agreement, the Panel shall deliver its Report to the Parties within ninety days (90) following the close of the public hearings.

2.0 THE EIS AS A BASIS FOR PUBLIC REVIEW

The purpose of the EIS Guidelines is to provide specific guidance to the Proponent on the content of the EIS document that will move the review process toward its objectives as set out in the Agreement. It will serve as the basis for the Panel's review of the Project and will enable any interested party, the public, and the Panel to understand and assess the potential adverse environmental effects of the Project.

To adequately describe the potential adverse environmental effects of the Project, the EIS must provide the following information:

a. purpose of the Project;
b. need for the Project;
c. alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means;
d. alternatives to the Project;
e. the location of the proposed undertaking and the nature and sensitivity of the surrounding area;
f. planned or existing land use in the area of the undertaking;
g. other undertakings in the area;
h. the environmental effects (both positive and negative) of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
i. the socio-economic effects of the Project;
j. the temporal and spatial boundaries of the study area(s);
k. comments from the public that are received during the review;
l. steps taken by the Proponent to address environmental concerns expressed by the public;
m. measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
n. follow-up and monitoring programs including the need for such programs;
o. the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future; and
p. residual adverse effects and their significance.

As an integral part of the joint review process, an executive summary must be provided which addresses each of the above listed sections. It must be written in clear, concise language, with minimum use of technical terminology. Summary tables and graphics should be considered as effective means of presenting data. The executive summary must be available in English and French. It must also be made available in electronic format to assist in distribution.

3.0 CONSIDERATION OF TRADITIONAL KNOWLEDGE

Traditional knowledge, which is rooted in the traditional life of Aboriginal people, has an important contribution to make to an environmental assessment. This knowledge is based on personal observation, collective experience and oral transmission over generations. The Proponent should consider local traditional knowledge and expertise in preparing the EIS.

4.0 PREPARATION AND PRESENTATION OF THE EIS

This section sets out how the EIS is to address public participation as well as the study strategy, methodology and presentation. Through its EIS, the Proponent must demonstrate that it has addressed the considerations listed in Section 2.0.

4.1 Public Involvement

Public involvement is a central objective of the overall review process and a means to ensure that the Proponent addresses public concerns. In preparing the EIS, the Proponent must demonstrate how it has consulted with residents and organizations that are likely to be affected by the Project, and other parties who may be interested in the Project.

The Proponent must describe in the EIS the objectives of this consultation, the methodology used, the results, and the ways in which the Proponent has addressed the concerns identified by using a concordance table.

Meaningful public involvement in the environmental assessment review can only take place if the public has a clear understanding of the proposed Project as early as possible in the review process. Therefore, the Proponent must:

a. continue to provide up-to-date information describing the Project to the public and especially to the communities likely to be most affected by the Project; and
b. explain the results of the EIS in a clear direct manner to make the issues comprehensible to as wide an audience as possible (see Section 4.4).

4.2 Study Strategy and Methodology

The Proponent is expected to observe the intent of the EIS Guidelines and to identify and describe any significant adverse environmental effects caused by the Project, including situations not explicitly identified in these EIS Guidelines. It is possible that these EIS Guidelines include matters that, in the judgement of the Proponent, are not relevant or significant to the Project. If such matters are omitted from the EIS, they must be clearly indicated so that the public and other interested parties have an opportunity to comment on this judgement. Where the Panel disagrees with the Proponent's decision, it may require the Proponent to provide additional information.

The Proponent must explain and justify methods used to predict potential adverse environmental effects of the Project on each valued environmental component (VEC), which includes biophysical and socio-economic components, on the interactions among these components and on the relations of these components within the environment. The information presented must be substantiated. In particular, the Proponent must describe how VECs were identified and what methods were used to predict and assess the adverse environmental effects of the Project on these components. The value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans. The culture and way of life of the people using the area affected by the Project may themselves be considered VECs.

In describing methodology, the Proponent must explain how it used scientific, engineering, traditional and other knowledge to reach its conclusions. Any assumptions made must be clearly identified and justified. All data, models and studies must be documented so that the analysis is transparent and reproducible. All data collection methods must be specified. The uncertainty, reliability and sensitivity of models used to reach conclusions must be indicated. The sections on the existing environment and on potential adverse environmental effects predictions and assessment must be prepared to the highest standards in the relevant subject area. All conclusions must be substantiated.

The EIS must identify all significant gaps of knowledge and understanding where they are relevant to key conclusions presented in the EIS. The steps to be taken by the Proponent to address these gaps must also be identified. Where the conclusions drawn from scientific and technical knowledge are inconsistent with the conclusions drawn from traditional knowledge, the EIS must contain a balanced presentation of the issues and a statement of the Proponent's conclusions.

4.3 Use of Existing Information

In preparing the EIS, the Proponent is encouraged to make use of existing information related to the Project. When relying on existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent shall either include the information directly in the EIS or clearly direct (e.g. through cross-referencing) the Panel to where it may obtain the information (i.e. indicate documents and/or sections of documents and where it may be obtained if information not included in the EIS or supporting annexes). When relying on existing information, the Proponent must also comment on how representative the information or data is over space and time, and any limitations on the inferences or conclusions that can be drawn from them.

4.4 Presentation of the EIS

For clarity and ease of reference, it is suggested that the EIS be presented in the same order as the EIS Guidelines. However, in certain sections of the EIS, the Proponent may decide that the information is better presented following a different sequence. The EIS must include a guide that cross-references the EIS Guidelines with the EIS so that points raised in the EIS Guidelines are easily located in the EIS.

In the interest of brevity, the EIS should make reference to, rather than repeat, information that has already been presented in other sections of the document. A key subject index would also be useful and should reference locations in the text by volume, section and sub-section. As well, the names of the Proponent's key personnel and/or contractors and sub-contractors responsible for preparing the EIS shall be listed. Supporting documentation should be provided in separate volumes, and should be referenced by volume, section and page in the text of the main EIS. The Proponent should make the EIS text available in an electronic format to facilitate internet access.

The Proponent should present the EIS in the clearest language possible. However, where the complexity of the issues addressed requires the use of technical language, a glossary defining technical words and acronyms must be included. The Proponent should provide charts, diagrams and maps wherever useful to clarify the text, including perspective drawings that clearly convey what the developed Project site would look like.

4.5 EIS Summary

It is essential to the public hearings stage of the joint review that residents of those communities likely to be affected by the Project have an adequate understanding of the proposed Project and its potential adverse environmental effects. The Proponent should therefore prepare a plain language summary of the EIS that will provide the reader with a concise but complete overview of the EIS, including all the information listed in Section 2.0. This summary should be made available in English and French. The Proponent should also make the EIS summary available in an electronic format.

PART II CONTENT OF THE EIS

Part II of the EIS Guidelines provides specific instructions for the content of each section of the EIS.

5.0 INTRODUCTION

This section should orient the reader to the EIS by briefly introducing the geographic setting, the Project, the underlying rationale for the Project, the Proponent, the joint federal and provincial review process and the content and format of the EIS.

5.1 The Setting

The Proponent should provide a concise description of the geographic setting in which the Project is proposed to take place. This description should integrate the natural and human elements of the Environment in order to explain the interrelationships between the physical and biological aspects and the people and their communities.

5.2 The Project

The Proponent will briefly summarize the Project, its purpose, location, scale, components, activities, scheduling and costs. The Proponent must include the components outlined in the Terms of Reference of the Agreement.

5.3 The Proponent

This section should introduce readers to the Proponent with summary information on the nature of the management structure and organizational accountability for:

a. the design, construction, operation and modification of the Project;
b. the implementation of environmental mitigation measures and environmental monitoring; and
c. the management of potential adverse environmental effects.

5.4 The Planning Context

The Proponent will identify the planning context for the environmental assessment of the Project. Policy and planning considerations, such as government policies, regulations, and land use plans that have a bearing on the Project must be discussed. The need for the environmental assessment under the *Canadian Environmental Assessment Act* and the Nova Scotia *Environment Act* must be identified.

5.5 The Environmental Impact Statement

The Proponent must:

a. briefly explain the environmental assessment review process in the context of the Panel's terms of reference included in the Agreement;
b. describe the role of the EIS in the overall environmental assessment process; and
c. provide an annotated table of contents for all volumes and background reports, and any other information that will help the reader find his or her way around the EIS.

6.0 BOUNDARIES FOR THE ENVIRONMENTAL ASSESSMENT

Scoping establishes the boundaries of the environmental assessment and focuses the assessment on relevant issues and concerns. By defining the spatial and temporal boundaries, a frame of reference for identifying and assessing the environmental effects associated with the Project will be established. Different boundaries may be appropriate for each VEC.

6.1 Spatial Boundaries and Scale

In determining the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects, the Proponent will consider, but not be limited to, the following criteria:

a. the physical extent (terrestrial and marine) of the proposed Project, including any offsite facilities or activities;
b. the extent of aquatic and terrestrial ecosystems potentially affected by the Project;
c. the extent of potential effects arising from noise, light and atmospheric emissions;
d. land use for commercial, cultural, recreational and aesthetic purposes by communities whose areas include the physical extent of the Project; and
e. the size, nature and location of past, present and reasonably foreseeable projects and activities which could interact with items b) and c).

These boundaries also indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects must be presented. The Proponent is not required to provide a comprehensive baseline description of the environment at each of the above scales, but should provide sufficient detail to address the relevant environmental effects of the Project and the alternative means. The EIS must contain a justification and rationale for all boundaries and scales chosen.

6.2 Temporal Boundaries

In characterizing the environmental effects of the Project, the Proponent shall consider the current baseline environment and environmental trends within the study area. The description of the existing baseline and the environmental trends shall include a consideration of past projects and activities carried out by the Proponent and/or others within the study area.

In describing and predicting the environmental effects of the Project, the Proponent shall cover the period from the start of any pre-construction activity associated with the Project through construction, operation, including maintenance and repairs, and any modifications through the proposed life of the Project, and eventual decommissioning, reclamation and abandonment.

In assessing cumulative environmental effects within the study area, the Proponent shall consider the effects of the Project in combination with other past, present and reasonably foreseeable projects.

As is the case for the determination of spatial boundaries, the temporal boundaries must indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects will be presented.

7.0 PROJECT DESCRIPTION

The Proponent must provide a description of the Project that includes the following:

a. an explanation of the purpose and need for the Project;
b. an analysis of alternatives to the Project including, but not limited to, the "do nothing" scenario;
c. an analysis of alternative means of carrying out the Project including, but not limited to, alternative locations, size of the quarry, use of existing marine infrastructure, quarrying methods, production rates and alternative transportation;
d. identification and application of criteria to determine the technical and economic feasibility of the alternative means (e.g. transportation, natural, social, economic and cultural environment);
e. identification of the potential adverse environmental effects of each feasible alternative means;
f. location of the Project and the timing for the Project and related projects;
g. relevant information on the Project's history and current status;
h. major components of the Project and their location, including using maps indicating: boundaries of the Project in relation to other rights of way (e.g. rail lines, gas pipelines, road interchanges, shipping lanes), existing infrastructure, land uses, waste disposal areas, temporary and permanent existing and proposed transportation systems and routes, important environmental features and local neighbourhoods;
i. design features of the Project including, but not limited to, safety features, efficiency, network aspects (provision of shipping continuity and links to existing marine infrastructure);
j. any relationship to a series of separate projects or to a larger project must be stated, as it could have implications for the consideration of alternatives, cumulative environmental effects and mitigation options;
k. the relationship of the Project to publicly adopted policy and plans at regional, provincial and federal levels;
l. a description of those aspects of the Project, including accidents and malfunctions, that could reasonably be expected to affect the environment;
m. an explanation of how the environment has influenced the design of the Project;
n. a discussion of how design, engineering and management plans are consistent with the maintenance of ecosystem function and integrity; and
o. a risk assessment of those conditions that might impair the fulfillment of the Proponent's plans and commitments regarding the avoidance or mitigation of adverse effects.

7.1 Regulatory Environment

The Proponent must describe the existing regulatory environment (federal, provincial, municipal) including all permitting, licensing and regulatory requirements and Municipal Planning Strategy and Bylaw requirements that apply to all phases of the Project and associated infrastructure. The Proponent must also include a description of which guidelines and standards would apply to the Project (e.g. TERMPOL Code, Nova Scotia Pit and Quarry Guidelines). Those applicable standards or guidelines shall also be

referenced in the appropriate sections of the report. Each regulatory approval required must be listed with the following details:

a. activity requiring approval and when it is required;
b. regulatory agency;
c. name of approval or permit; and
d. associated legislation.

7.2 Project Justification

7.2.1 Purpose and Need for the Project

Identify the main function of the Project. Explain what is to be achieved by carrying out the undertaking, the opportunity the undertaking is intending to satisfy and who will benefit from the undertaking.

7.2.2 Alternatives to the Project

Include an analysis of alternatives to the Project[1] including, but not limited to, a "do nothing" scenario, meeting market demands with alternative construction materials, and meeting market demands through increased efficiency of resource use extracted from other sites. Identification and application of criteria used to determine the technical and economic feasibility of the alternatives to the Project (e.g. transportation, natural, social, economic and cultural environment). This must be done to a level of detail which is sufficient to allow the Panel and the public to compare the Project with the alternatives in terms of the economic costs and the environmental, social and economic benefits. The Proponent must include reasons for selection of the Project as the preferred alternative, including the reason for rejection of other alternatives.

7.2.3 Alternative means of Carrying Out the Project

Include an analysis of other alternative means of carrying out the undertaking in each phase of the Project and provide reasons for the selection of the proposed mean(s). Examples include alternative sites, alternative extraction methods, alternative technologies for wastewater treatment, alternative transportation modes and routes, other reclamation and decommissioning options, etc. This section must include alternatives to marine transport. Identify the potential adverse and beneficial environmental effects of each feasible alternative mean to a level of detail which is sufficient to allow the Panel and the public to compare the environmental effects, both biophysical and socio-economic, of the Project with the effects of the alternative means. The Proponent must include reasons for selection of the proposed Project including justification for rejection of other alternative means.

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[1] Canadian Environmental Assessment Agency (October 1996). Addressing "Need for", "Purpose of" "Alternatives to" and "Alternative Means" under the *Canadian Environmental Assessment Act.* OPS-EPO/2 – 1998. Available from: www.ceaa-acee.gc.ca

7.3 Detailed Project Description

The description must address all phases of the Project in sufficient detail to allow the Proponent to predict potential adverse environmental effects and address public concerns about the Project. The Proponent must describe the Project as it is planned to proceed through the site preparation and construction, operation and maintenance and any potential modifications. The description must include a timeline for all phases of the Project, with detailed decommissioning, abandonment and reclamation plans. This section must include a discussion of the planned uses of the marine terminal as related to the project and any potential use other than for the project, including the use of the marine terminal after the decommissioning of the quarry.

7.3.1 Physical Components

Describe in detail and identify the location of the major physical components of the undertaking relating to the quarry such as, but not limited to, aggregate extraction and processing, loadout facilities, stockpiles, roadways, topsoil and overburden piles, retention and settling ponds, fuel and dangerous goods storage areas, and administrative buildings.

Provide a detailed description (including location) of the major physical components related to the marine terminal. This must include, but not be limited to, conveyors, ship loaders, berthing dolphins, mooring buoys and fuelling facilities.

A scaled site map of the main Project components will be provided.

7.3.2 Site Preparation and Construction, Components and Activities

Provide a detailed description of the physical components required for site preparation and construction of the quarry, and the associated activities and techniques that will be used. The Proponent must consider addressing, but not be limited to, the following:

a. all site preparation activities, including drilling and blasting, stripping of vegetation, and clearing and grubbing;
b. all blasting (handling procedures, frequency and size, pre-blast surveys, weather condition considerations);
c. all topsoil and overburden storage areas (location and dimensions);
d. all site access roads (including gradient) and public roadways;
e. all sewage treatment and waste management systems;
f. all dangerous goods storage areas;
g. all watercourse crossings and diversions, including wetland alteration;
h. all structures (e.g. offices and warehouses) and utilities;
i. all erosion and sedimentation control measures; and
j. visual effect management (e.g. landscaping, screening mounds and plantings, use of existing features, photographic records).

Provide a detailed description of the physical components required for the construction of the marine terminal and associated infrastructure, and the associated activities and techniques that will be used. The Proponent must consider addressing, but not limit the description to, the following:

a. all site preparation activities, including any land based activities associated with the installation of marine infrastructure;
b. the requirements for any drilling, blasting, or dredging, including handling procedures, frequency and size, pre-blast surveys, weather condition considerations,;
c. the anchoring of pile support structures and construction of concrete caps as dolphins;
d. all structures (e.g. offices and warehouses) and utilities;

This section shall also discuss risk management (e.g. contingency plans for uncontrolled release of substances, emergency response plans) and proposed construction schedules, including days of the week, times of the day, seasonal schedules and anticipated commencement and completion dates.

7.3.3 Operation and Maintenance

Provide a detailed description of the physical components that will be required for Project operation and maintenance, and the associated activities and techniques. The Proponent must consider including, but not be limited to, the following:

a. the lifespan of the Project, annual average and maximum production rates
b. all drilling and blasting (frequency and size, pre-blast surveys, weather condition considerations);
c. all crushing, screening and washing facilities;
d. all equipment;
e. all stockpiling;
f. all water management (detailed water budget, including effluents, treatment and water recycling opportunities);
g. all waste management (overburden, management of acid-generating rock, management of ammonia from blasting activities);
h. sewage management, solid waste;
i. all dangerous good use and waste dangerous goods management;
j. land transportation (modes, routes, load size and frequency);
k. marine transportation (routes, vessel size and type, frequency, duration of berthing);
l. the use of the marine terminal for purposes other than those associated with the quarry
m. environmental controls for noise, dust, and viewscape protection; and
n. risk management (contingency plans for uncontrolled release of substances, emergency response plans).

7.3.4 Modification Phase

This section must describe the Proponent's approach to, and conceptual plans for potential modifications. The Proponent must specify the conditions which would necessitate modifications of the Project. Expansion or other modification activities must be generally described and must include, to the extent possible, an overview of planned components such as those outlined in Section 7.3.1.

7.3.5 Decommissioning and Reclamation

The Proponent must provide a decommissioning and reclamation plan which details the immediate plans for quarry reclamation as operations advance (progressive reclamation), plans for decommissioning the operation (removal of equipment and structures), and the long-term objective for future use of the property following decommissioning. Reclamation must include all exploration boreholes and test pits. There must be a commitment to develop a future detailed reclamation plan for the entire site, including which organization and individual would be responsible. Details must be provided on plans for monitoring and maintaining reclamation efforts to ensure success. This section must also include plans for the future use or decommissioning of the marine terminal and associated infrastructure and potential monitoring plans.

7.4 Environmental Protection Plan

The Proponent must describe its Environmental Protection Plan and its environmental management system through which it will deliver this plan. The Plan must provide an overall perspective on how potentially adverse environmental effects will be managed over time and must include:

a. a plan to control, minimize, and mitigate any contaminants, such as heavy metals, excess suspended solids, dioxins, carbon monoxide, oxygen demanding materials or organic contaminants that may be released or generated by the Project;
b. a plan to control air emissions from the Project;
c. plans to manage human/wildlife interactions at the site and adjacent areas and address hazards to wildlife presented by the Project;
d. emergency response and contingency plans, including plans for addressing spills and other accidents and malfunctions both on land and in water; and,
e. plans for ongoing site rehabilitation during the life of the Project.

8.0 EXISTING ENVIRONMENT

The purpose of this section is to describe the existing environment prior to Project development and what is valued by the members of the public, at a level and scale of detail that enable readers to understand the material presented.

This section of the EIS must provide a baseline description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions as well as the variability in these components, processes and interactions over time scales appropriate to this EIS. The Proponent's description of the existing environment must be in sufficient detail to permit the identification, assessment and determination of the significance of potentially adverse environmental effects that may be caused by the Project and to adequately identify and characterize the beneficial effects of the Project.

This description must include, but not necessarily be limited to those VECs, processes, and interactions that either were identified to be of public concern during scoping sessions or that the Proponent considers likely to be affected by the Project. The location of these VECs must be indicated on maps or charts. In doing so, the Proponent must indicate to whom these concerns are important and the reasons why, including social, economic, recreational, and aesthetic considerations. The Proponent must describe the nature and sensitivity of the area within and surrounding the Project and any planned or existing land use in the area. The Proponent must also indicate the specific geographical areas or ecosystems that are of particular concern, and their relation to the broader regional environment and economy, e.g., the contribution of the Digby Neck area to critical habitat, bird and fish population stocks, the presence of particular species and species at risk in the region.

In describing the physical and biological environment, the Proponent must take an ecosystem approach that takes into account both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The Proponent must identify and justify the indicators and measures of ecosystem health, social health and integrity it uses. These must be related to Project monitoring and follow-up measures.

For the biological environment, baseline data in the form of inventories alone is not sufficient for the Panel to assess effects. The Proponent must consider the resilience of species, communities, and habitat. The Proponent is not required to generate new stock assessments for species other than fish in affected aquatic environments, but it must include all available historical data on population stocks and status. Emphasis must be on those species, communities and processes identified as VECs during the scoping sessions. However, the interrelations of these components and their relation to the entire ecosystem and communities of which they are a part must be indicated. The Proponent must address such issues as habitat, nutrient and chemical cycles, food chains, productivity, as these may be appropriate to understanding the effect of the Project on ecosystem health and integrity. Range and probability of natural variation over time must also be considered.

In describing the socio-economic environment, the Proponent must provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect the people and communities in the study area.

The Proponent must present information in the EIS so that it conforms to the most current *Wild Species Priorities, Inventory and Mitigation Standards* available from the Nova Scotia Department of Natural Resources.

In providing baseline information on the environment, the Proponent must present a sufficient time-depth of data and information to establish norms, trends, and extremes, to the extent that such information is available. The Proponent must comment on the quality and reliability of these data and their applicability for the purpose used, and clearly identify gaps, insufficiencies, and uncertainties, especially those that must be remedied for monitoring purposes. The baseline, while necessarily relying on recent and current data, must not be a static or equilibrium description of the environment.

Without limiting the range of consideration, the Proponent must consider the following components, the interactions between these components, and their interactions with the physical and biological environment.

8.1 Biophysical Environment

8.1.1 Geology

Provide a general description of the geologic features of the quarry site, including the surficial geology (e.g. soil types, permeability, porosity, risk of erosion, etc.) and bedrock geology (e.g. acid producing/consuming rocks, sulphides, carbonates, host rock, etc.) as it relates to the undertaking. If acid slates are present, additional information will be required to determine if the material is net acid producing/consuming. The most current geological maps and stratigraphic terminology must be used when describing the site geology. The geological maps must be included in the registration document.

8.1.2 Surface Water

Provide a general description of the hydrological conditions and water quantity and quality for all surface waters, including ephemeral streams, within and in the vicinity of the quarry development. Estimates of normal (base and mean) flows and extreme (high and low) flows and water levels must be provided for any watercourses that may potentially be affected by pit dewatering, water extraction or diversion.

8.1.3 Groundwater

Provide a pre-development well water survey to establish baseline well water quality and quantity. Provide a general description of the hydrological conditions and water quality and quantity for all groundwater supplies that may be impacted by the quarry

development, including all freshwater streams whose groundwater supplies originate within the quarry even though they may surface and flow outside the quarry. Include detail on the type, depth, number and location of all wells that may be impacted by the quarry development.

The characteristics of surface water and groundwater interactions must also be described (e.g., physical features or mechanisms influencing recharge or discharge characteristics potentially affecting shallow and deep groundwater resources, and groundwater contributions to stream base flows in the study area).

8.1.4 Wetlands

Identify the location, size and class of any wetland on-site or downstream that may be impacted by the quarry development. Evaluation of the wetlands must include the following aspects: wildlife habitat potential (including rare and endangered species), groundwater recharge potential, the role of the wetland in surface flow regulation (stormwater retention and flood control), and the potential role of the wetland in water treatment.

8.1.5 Physical Oceanography

Describe local oceanographic conditions, including, but not limited to:

a. average and maximum current speed and direction;
b. bathymetry (seabed topography);
c. water column characteristics (temperature, salinity, potential for sea ice);
d. wind and swell characteristics, fetch, occurrence of storms;
e. tidal characteristics (range, period, volume);
f. conditions within the shipping lanes to be used for aggregate transport; and
g. sediment characteristics (type, quality, transport).

8.1.6 Terrestrial Species and Habitat

Describe the local and regional floral and faunal species, including birds (both permanent residents and migratory), occurrence and distribution, range, abundance, and population status, including seasonal variation and variability over multiple years. Qualified professionals (biologist, botanists, etc.) must be consulted by the Proponent to conduct appropriate surveys to identify flora and fauna species that exist, including any species at risk that may exist throughout the Project site and throughout any other areas which may be impacted by the development. Botanical and wildlife surveys must be conducted at the site during the appropriate growing or breeding season.

Identify wildlife habitats, including areas with high wildlife concentrations and wildlife corridors, including bird migratory routes, which may exist within the boundaries of the development. The status and productivity of these habitats must be evaluated.

Identify all protected and conservation areas of provincial, federal and municipal jurisdictions (e.g. provincial wilderness areas, provincial parks, sites of ecological significance, and nature reserves, federal migratory bird sanctuaries and wildlife management areas, and municipal protected water supply areas, etc.) in the vicinity of the undertaking.

As there is concern for the movement of potentially invasive species within provincial and international boundaries, these species must be considered. Current lists of these species are available from Environment Canada's Canadian Wildlife Service and through the National Botanical Services in Ottawa.

8.1.7 Aquatic Species and Habitat

The principles and information sources that apply to terrestrial species and habitat (see 8.1.6) also apply to freshwater and marine species and habitat. The description of these species and habitat must identify any species at risk and ecologically sensitive and/or critical habitat and migratory routes of fish and marine mammals. This section must also identify potentially invasive species.

Identify any fish or fish habitat that exists in any identified watercourse within the quarry site or any other receiving watercourse that may be impacted by the development. Describe the marine habitat and species of fish, including pelagic and demersal finfish, shellfish, crustaceans and marine mammals, likely to be present in the area.

A description of any seasonal variation in the location, abundance and activities of aquatic species must be included. Describe and identify key habitat features, such as spawning, rearing, nursery, feeding, migration and overwintering areas, as they occur within the project area. In the course of describing aquatic species and habitats, the Proponent must include any consultations with, and document, traditional ecological knowledge from local fishermen and fishermen's associations.

8.1.8 Species at Risk

The Proponent shall identify all aquatic and terrestrial Listed species (those found on the *Species at Risk Act* (SARA) *List of Wildlife Species at Risk*), and their critical habitat (if identified in a recovery strategy or action plan), found within the regional study area. The Proponent shall also identify any additional species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) found in the regional study area, and indicate when each species is expected to become listed under SARA. The Proponent shall consider all species listed as Endangered, Threatened, or Special Concern in their assessment.

For all above mentioned species, the Proponent shall provide information (with references) on the species' seasonality, frequency, habitat (as defined in Section 2 of SARA), critical habitat (if identified in a recovery strategy or action plan), and current status rank (e.g., endangered, threatened, species of special concern). Among other

resources (e.g., species specialists, primary literature), information regarding these topics may be found in COSEWIC status reports, recovery strategies, and action plans. If critical habitat has not yet been identified for the species, this fact must be noted by the Proponent.

All species listed under the Nova Scotia *Endangered Species Act* shall be identified and all species listed as Endangered, Threatened, or Vulnerable must be considered in the assessment. Species listed under the Nova Scotia General Status of Wild Species must also be identified and all species designated as Red or Yellow must be considered in the assessment. To satisfy provincial requirements, the EIS shall include the required information as stated in the Standards and Process Applied to Provincial Environmental Impact Assessments: Wild Species Priorities, Inventory and Mitigation Standards For Reporting as prepared by the Nova Scotia Department of Natural Resources.

8.1.9 Climatic Conditions (Including Air Quality)

Provide a description of the climatic conditions in the Project area, considering both the quarry site and the marine terminal, with an emphasis on elements that will have an effect on, or interfere with, the Project. The description must include how the factors may be expected to change with the seasons. Factors discussed must include:

a. air temperature and relative humidity;
b. precipitation (average and maximum amounts, percentage as rain, snow, fog);
c. wind speed and direction;
d. solar radiation; and
e. occurrence of storms.

A description of the ambient air quality in the Project area shall be provided, with emphasis on substances that may be emitted due to the Project. Particular attention is to be paid to ambient dust levels in areas where quarry or loading activities may contribute to increased dust levels.

8.1.10 Noise levels

Provide a baseline study of all sensitive areas within 200 metres of the quarry site and at any other areas where loading and traffic noise could be expected to have an environmental effect. Background ambient noise levels must be characterized for the quarry and loading facilities.

8.2 Socio-Economic Conditions

8.2.1 Economy

Describe population and community distribution in the project area. This must include a description of the proximity of the Project to affected communities, including the number of residences within intervals of 500 metres, 1, 1.5 and 2 kilometres of the proposed

undertakings. Communities outside of the 2 kilometre radius that could potentially be affected by the Project may also have to be identified, as appropriate. Discuss the contraction and growth patterns and information on demographics, including age and employment statistics. Describe the economic conditions for the region and surrounding communities. Information must be provided on the available labour supply and rates of employment for the region and surrounding communities.

8.2.2 Land Use and Value

Identify the past land use(s) of the site. Describe the planned and existing land uses within the Project site and any other area that may be impacted by the Project development. This must include a description of existing land based infrastructure that is likely to be affected by the Project such as sewer and water treatment distribution systems, wells, waste management areas, etc.

8.2.3 Commercial and Recreational Fisheries

Identify the geographical locations of historical and current regional freshwater and marine fishing operations and the seasonal variations of fishing activities for commercial, recreational and aboriginal uses, including current use of the area for aquaculture or its potential use. Describe the types of fisheries, including, but not limited to, lobster, scallops, crab, herring, mackerel, gaspereau, freshwater speckled trout, sea urchin dive fisheries and marine plant harvesting.

8.2.4 Land Based Transportation

Describe the existing conditions of the proposed modes and routes of transportation (e.g. provincial highways, arterial highways, on-site access roads, etc.) that will be used throughout the quarry development. Include information on the existing types and volumes of traffic. Describe the areas through which trucks will travel (e.g. residential or school areas).

8.2.5 Marine Transportation

An explanation of the management of vessel traffic in the vicinity of the marine terminal must be provided. This must include marine traffic such as recreational boating, shipping, commercial and passenger traffic with focus on navigation safety.

8.2.6 Recreation and Tourism

Discuss the level and value of existing and planned recreation and tourism activities (e.g. hunting, fishing, hiking, parks, sea kayaking, whale watching) for the surrounding areas.

8.2.7 Human Health

Provide current information on the health status of the communities in the Project study area. Human health considerations must include physical, social, cultural, and economic aspects. Also, indicate the proximity of the Project to individual and community water supplies. Potential effects on health, those aspects of human health that are or can be affected by contaminants or changes in the environment must be identified in Section 9.2.7.

8.2.8 Aboriginal Land and Resource Use

Identify the lands and resources of specific social, cultural or spiritual value to Aboriginals of Nova Scotia with focus on the current use of lands and resources for traditional purposes. Uses may include, but are not limited to, camping, travel on traditional routes, hunting, fishing, trapping, planting, harvesting, collecting, and any other traditional use.

8.2.9 Physical and Cultural Heritage Resources

Identify any terrestrial and marine areas containing features of historical, archaeological, paleontological, architectural or cultural importance. Describe the nature of the features located in those areas. Particular attention must be given to Aboriginal and Afro-Canadian cultural and historical resources.

8.3 Other Undertakings in the Area

Indicate the type, size, location and any other relevant information of other undertakings or developments in the area of the proposed quarry and marine terminal.

9.0 EFFECTS PREDICTION, MITIGATION MEASURES AND SIGNIFICANCE OF RESIDUAL EFFECTS

The purpose of this section is to identify potential effects of the Project, including ways in which the environment may be changed, where and for how long as well as whether residents and the environment will be better or worse off because of the construction and operation of the Project. An analysis of the Project's effects on the VECs must consider and demonstrate linkages between predicted physical and biological changes resulting from the Project. The Proponent must explain how VECs were chosen and provide the rationale for the determination of the significance of the effects on each VEC.

This section must:

a. identify what physical, biological and socio-economic changes may be expected to occur or could occur as a result of the Project, including accidents, malfunctions and unplanned events. The effects of worst case scenarios must be addressed as appropriate;
b. assess the effects;

c. describe and justify the Proponent's plans to mitigate the likely adverse effects of the Project, enhance the beneficial effects of the Project and assess the likely effectiveness of those plans; and
d. assess the significance of any adverse environmental effects after the implementation of mitigation measures.

The EIS must provide a comprehensive analysis of the short and long term effects of the Project on the environment and indicate the sensitivity of the function, integrity and health of the environment to these predicted effects. The Proponent must indicate the degree of uncertainty in predicting the potential adverse and beneficial environmental effects identified.

Mitigation

The Proponent must describe general and specific measures intended to mitigate the potentially adverse environmental effects of the Project for each component of the biophysical environment (section 9.1) and socio-economic environment (section 9.2) where mitigative measures would be necessary. Mitigation is defined as 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. The Proponent must indicate which measures respond to statutory or regulatory requirements, and which go beyond these.

The Proponent must present information on mitigation measures so that it conforms to the most current *Wild Species Priorities, Inventory and Mitigation Standards* available from the Nova Scotia Department of Natural Resources.

All proposed mitigation must be described by phase, timing and duration. Information must be provided on methods, equipment, procedures and policies associated with the proposed mitigation or restitution. The Proponent must discuss and evaluate the effectiveness of the proposed measures and assess the risk of mitigation failure and the potential severity of the consequences. Information must be provided on similar mitigation methods used with similar projects and the degree of success achieved.

The Proponent must indicate what other mitigation measures were considered (including the various components of mitigation) and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation must be justified. The Proponent must identify who is responsible for the implementation of these measures and the system of accountability.

Significance of the Residual Adverse Environmental Effects

The EIS must contain a detailed analysis of the significance[2] of the potential residual adverse environmental effects it predicts. It must contain clear and sufficient information to enable the Panel and the public to understand and review the Proponent's judgment of the significance of effects. The Proponent must define the terms used to describe the level of significance.

Determining whether the adverse environmental effects of a project are significant may be based on existing environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment or maximum acceptable levels of specific hazardous agents in the environment. If the level of an adverse environmental effect is less than the standard, guideline, or objective, it may be insignificant. If, on the other hand, it exceeds the standard, guideline, or objective, it may be significant.

The Proponent must assess the significance of predicted effects according to the following categories:

a. magnitude of the effect;
b. geographic extent of the effect;
c. timing, duration and frequency of the effect;
d. degree to which effects are reversible or mitigable;
e. ecological and social/cultural context;
f. probability of occurrence;
g. standards, guidelines or objectives.

Presentation of the effects, mitigation measures and the significance of the residual effects

The EIS must avoid repetition by identifying the potential adverse environmental effects, the proposed mitigation measures and the significance of the effects after mitigation measures have been taken into account, on each VEC, both biophysical and socio-economic, in the same discussion. A summary of the effects, mitigation and significance associated with each VEC must be provided in tabular format to provide clarity and ease of reference.

9.1 Biophysical Environment

[2] Canadian Environmental Assessment Agency (November 1994). Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects. Available from: www.ceaa-acee.gc.ca

9.1.1 Geology

Discuss the predicted effects on the identified geological formations and how those effects will be avoided or minimized. Potential effects to be considered must include, but not be limited to, the following:

a. effect on physical stability conditions (including physical strength characteristics) and thermal regime;
b. effect of modified ground ice or thermal conditions on existing infrastructure;
c. effect of frost heave; and
d. effect of acid rock drainage and seepage.

Discuss how these effects will be monitored, if required.

9.1.2 Surface Water

Discuss and quantify the predicted effects on existing surface water, both on-site and downstream (e.g. water course alterations, release of effluent, sedimentation, pit dewatering). Describe any proposed monitoring programs that will be designed to provide information on the effects of the Project on surface water.

9.1.3 Groundwater

Discuss how the quarry development may affect surrounding groundwater aquifers (e.g. groundwater draw-down) and provide detail on how the effects to groundwater will be avoided or mitigated. Modelling work may be required to predict these effects. All parameter estimates (e.g., precipitation, evaporation, ground-water flows, soil permeability, hydraulic roughness, water balance, etc.) reported by the Proponent must include the source of information (either estimates or empirical) and make reference to measurement standards or collection protocols used, assumptions built into the data, and data reporting that includes ranges and confidence estimate for the parameters.

Describe any monitoring programs, including sampling protocol and monitoring station locations that will be designed to provide information on effects on groundwater quality and quantity.

9.1.4 Wetlands

Predict the effects (with rationale) to all identified wetlands and provide information on how avoidance or mitigation will be used to preserve the ecological and hydrological integrity of the wetlands. Discuss any proposed monitoring of the identified wetlands, if required.

9.1.5 Physical Oceanography

This component must include an assessment of how the Project will affect local oceanographic conditions. The EIS must discuss potential effects on parameters such as current speed and direction, bathymetry, water column characteristics (temperature and salinity) and sediment characteristics (quality and transport).

9.1.6 Terrestrial Species and Habitat

Describe the predicted effects that the quarry development may have on all identified features within and outside the immediate footprint of the development as identified in section 8.1.6. Describe any monitoring programs that will be designed to provide information on effects on flora, fauna, habitat and protected and conservation areas to determine the success of the mitigation. Potential effects may include:

a. effect of loss of terrestrial habitat and the quality of lost habitat for relevant species;
b. disturbance of feeding, nesting or breeding habitats;
c. physical barriers to wildlife;
d. disruption, blockage, impediment and sensory disturbance (e.g., noise and light effects) of daily or seasonal wildlife movements (e.g., migration, home ranges, etc.);
e. direct and indirect wildlife mortality; and
f. reduction in wildlife productivity;

9.1.7 Aquatic Species and Habitat

Describe the predicted effects that the Project will have on the freshwater and marine species and habitat identified in section 8.1.7. Describe any monitoring programs that will be designed to provide information regarding effects on aquatic species or their habitat to determine the success of any mitigation measures. Effects to be discussed must include:

a. effects on all water bodies that may experience changes to fisheries resources;
b. effects on habitat, including aquatic vegetation and sensitive areas such as spawning grounds, nursery areas, winter refuges and migrations corridors;
c. effects on aquatic species, including rare and/or sensitive species;
d. potential lethal effects on fish from acute exposure to mine effluent, including process upsets;
e. potential lethal and sublethal effects on fish due to chronic exposure to mine effluent, including within all proposed mixing zones;
f. effects of blasting on fish and fish habitat on local aquatic systems;
g. effects of all activities related to sediment dredging, including transportation and disposal around the marine terminal, on marine resources and habitat, particularly the effects of increased turbidity;
h. changes in water chemistry (nutrients, bacteria, major ions, metals) as a result of the Project; and

i. effects of dewatering and flow supplementation on fish habitat, winter refugia and fish migration.

9.1.8 Species at Risk

For all of the species identified in section 8.1.8, the Proponent shall:

a. Identify all potential adverse effects of the project on the species and their critical habitat;
b. Identify measures to avoid or lessen all adverse effects on the species and their critical habitat that are consistent with any existing recovery strategy or action plan, and;
c. Design and implement a program to monitor all adverse effects on the species and their critical habitat that is consistent with any existing recovery strategy or action plan.

Note that for SARA Listed species, this information is required under Section 79(2) of SARA. It is prudent to provide this information for species currently listed by COSEWIC that may become listed under SARA over the course of the environmental assessment and/or the lifetime of the Project. The Proponent shall assess the significance of all adverse effects of the project on all SARA and COSEWIC.

The Proponent shall also assess the significance of all adverse effects of the project on all species listed as Endangered, Threatened, or Vulnerable pursuant to the Nova Scotia *Endangered Species Act* and all species designated as Red or Yellow under the *Nova Scotia General Status of Wild Species*. The Proponent shall explicitly state whether or not any project effects are expected to contravene the SARA prohibitions (SARA Sections 32, 33 and 58).

9.1.9 Climatic Conditions (Including Air Quality)

Discuss how dust from blasting, trucking, etc., and other air emissions will affect the existing atmospheric conditions and what will be done to avoid or mitigate negative effects. Describe any monitoring programs that will be designed to provide information regarding effects on air quality and the success of mitigation measures employed.

9.1.10 Noise Levels

Discuss the predicted effects (with rationale) that increased noise levels from blasting, crushing activity, equipment operation, trucking, etc., will have on wildlife and residents near the quarry development. Include the decibel ratings for all machinery to be used at the quarry.

Discuss potential effects of noise associated with the construction of the marine terminal, including effects from activities such as blasting and driving, drilling or grouting of piles, dredging, and increased vessel traffic.

Discuss the methods to be used to monitor noise levels throughout the life of the development.

9.1.11 Effects of the Environment on the Project

Describe the potential effects that the environment may have on the Project. The assessment must take into account how local oceanographic conditions and natural hazards, such as severe meteorological conditions and seismic events, could adversely affect the Project. Among the parameters to be considered must be the effect of extreme precipitation events on site water management and the influence of wind and waves on the marine terminal infrastructure and on aggregate loading.

Consideration of applicable climate elements must include, but not be limited to:

a. an estimate of its importance to the project;
b. an estimate of how sensitive the project is to variations of this element
c. a discussion of climate data used; and
d. change in sea level.

The sensitivity of the project to overall climate variability must be identified and discussed. The Agency document "Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners"[3] provides guidance for incorporating climate change into an environmental assessment.

9.2 Socio-Economic Conditions

9.2.1 Economy

Provide detail on the anticipated economic activity and opportunities including, but not limited to, employment levels (during all phases of the Project), property taxes, and property values. Specify whether these will be new jobs or existing jobs which will be maintained.

Predict the positive and negative effects (with rationale) that the proposed quarry development will have on the economy. Discuss how any negative effects on the economy will be avoided or mitigated.

9.2.2 Land Use and Value

Describe the predicted effects (with rationale) that the proposed quarry development will have on the existing and planned land and water uses, including changes in aesthetics

[3] Canadian Environmental Assessment Agency (November 2003). Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners. Catalogue No. En106-50/2003E-PDF. Available from: www.ceaa-acee.gc.ca

and/or economic, education, and recreational opportunities caused by the construction, operation and modification of the Project in terms of increased noise levels, lowered air and water quality, alteration or visual and topographic characteristics of the area. Discuss the potential effects on existing structures (e.g. building foundations, wells, etc.) caused by blasting, etc. Discuss plans to conduct a pre-blast survey prior to any blasting activities. Also discuss temporary and permanent restrictions on land use during construction and operation.

9.2.3 Commercial and Recreational Fisheries

Identify the predicted effects on the fisheries and/or loss of access to fishing grounds due to the project, such as the effects resulting from the construction phase and presence of the marine terminal, navigation restrictions and construction or operational vessels. The discussion must also include potential damage to fishing gear or vessels.

9.2.4 Land Based Transportation

Discuss the potential usage of the roadways, including the time of year, frequency, route and the hours of operation. Discuss the predicted effects (with rationale) to local and regional traffic volumes and road conditions, including provincial highways, arterial highways and on-site access roads that will be used throughout the quarry development. Include information on the potential effects on the areas through which trucks will travel, such as residential or school areas. Include the proposed methods for avoiding effects on the existing transportation infrastructure.

9.2.5 Marine Transportation

Discuss the predicted effects of increased ship traffic on existing ship traffic in the Bay of Fundy and Whites Cove. The effects assessment must include potential conflicts between existing marine traffic and construction vessels, including navigation restrictions, and conflicts between existing marine traffic and aggregate carriers. Provide an indication as to the type, size, and number of vessels associated with all components of the Project and the frequency that any vessel will be in the Project area as defined by the spatial boundaries for the scope of the Project. Disruption of marine traffic through accidents associated with the shipping and loading of aggregate, including groundings and fuel spills, must be discussed. Potential interference with navigation due to presence of the berthing dolphins, mooring buoys and dredgeate disposal sites must also be considered.

9.2.6 Recreation and Tourism

Describe the predicted effects (with rationale) the quarry development will have on recreation and tourism. Include a discussion of the effects of the quarry operation on the landscape aesthetics and viewplanes.

9.2.7 Human Health

Discuss the potential effects (with rationale) that the undertaking could have on the physical, mental, and cultural health of affected communities and the employees in the surrounding area.

The analysis must include, but not be limited to, the following:

a. an analysis of the effects of the project on the health and safety of all workers, including the possible effects of any accidents or spills;
b. an assessment of the project's potential effects on human health through sources of contaminants from the project and potential exposure pathways into air and potable water;
c. any potential effects of air emissions associated with the project on human receptors within the project study area, such as health effects of nitrogen oxides, sulphur oxides, VOCs, carbon monoxide, dioxins/furans, metals, hydrogen chloride, and any other emissions from fossil fuel combustion, and explosives use;
d. any potential effects of project-generated noise on human receptors within the project study area.

9.2.8 Aboriginal Land and Resource Use

Describe the effects on Aboriginal land and resource use from construction activities, the presence of the quarry and marine terminal and associated activities.

9.2.9 Physical and Cultural Heritage Resources

If it has been determined that sites of historical, archaeological, paleontological or architectural importance may exist, qualified professionals must be hired by the Proponent to conduct a survey to identify these sites. The potential effects of the Project on these sites and on any physical and cultural heritage resources that are likely to be affected by the Project must be identified and discussed. Describe the proposed measures to preserve, protect or recover these resources. The Agency document "Reference Guide: Assessing Environmental Effects on Physical and Cultural Heritage Resources"[4] provides guidance for assessing effects on heritage resources.

9.3 Other Undertakings in the Area

Describe the predicted effects (with rationale) that the proposed quarry development will have on other undertakings in the area.

9.4 Possible Malfunctions or Accidents

[4] Canadian Environmental Assessment Agency (1996). Reference Guide: Assessing Environmental Effects on Physical and Cultural Heritage Resources. Available from : www.ceaa-acee.gc.ca

The Proponent must identify and describe the probability of possible malfunctions or accidents associated with the Project, and the potential adverse environmental effects of these events. The description must include the safeguards that have been established by the Proponent to protect against such occurrences and the contingency procedures in place. The Proponent must be aware of the various safety regulations and standards of the jurisdictional authorities which apply to the Project, including those that relate to marine vessel movements. An environmental protection plan that describes the protective measures and contingency procedures must be developed by the Proponent.

9.5 Cumulative Environmental Effects

The Proponent must identify and assess the cumulative adverse and beneficial environmental effects of the Project in combination with other past, present or reasonably foreseeable projects and/or activities within the study area. The approach and methodologies used to identify and assess cumulative effects must be explained. The Operational Policy Statement on "*Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act*"[5] provides guidance for assessing cumulative effects. In assessing the cumulative environmental effects of the Project in combination with other projects and/or activities, the Proponent must identify any changes in the original environmental effects and significance predictions for the individual Project. The Proponent must also discuss the effectiveness of the proposed mitigation and/or other restitution measures and the response to such changes, as well as the implications for monitoring and follow-up programs as described in Section 10.0.

9.6 Sustainable use of Renewable Resources Effects

The Proponent must include a consideration of the potential adverse environmental effects on the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future. The Proponent must clearly identify the renewable resources that may be affected by the Project and the criteria used in determining whether their sustainable use will be affected. Sustainable use may be based on ecological consideration such as, integrity, productivity, and carrying capacity.

9.7 Residual Adverse Effects and their Significance

This section of the report shall list and contain a detailed discussion and evaluation of the residual effects for each separate VEC, including the criteria for determining significance. Residual effects are those beneficial and adverse environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies or other acceptable means, including emergency response and contingency plans. Those effects that cannot be mitigated or avoided shall

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[5] Canadian Environmental Assessment Agency (March, 1999). Addressing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act.* (OPS-EPO/3- 1999). Available from: www.ceaa-acee.gc.ca

be clearly distinguished from those effects that will not be mitigated or avoided. These effects become important in the evaluation of a proposed Project as they represent the environmental cost of the Project.

The Proponent must outline its compensation plans and policies for addressing adverse residual environmental effects, including compensation for:

a. loss of fish habitat in accordance with Fisheries and Oceans Canada's policy for the Management of Fish Habitat; and
b. damage caused by the Proponent's activities to the environment, to property, or to the land and resource use of others.

If the project is expected to result in any adverse residual effects on species at risk or their critical habitat that will contravene the SARA prohibitions (SARA Sections 32, 33 and 58), the Proponent may wish to request a SARA Section 73 permit. In such an event, the Proponent should contact Environment Canada (for terrestrial species) or Fisheries and Oceans Canada (for aquatic species) regarding the permitting process. Note that SARA Section 73 permits are for use under exceptional circumstances only. Before such a permit can be issued, a number of strict preconditions must be met (SARA Subsections 73(2) to 73(9)).

10.0 MONITORING AND FOLLOW-UP PROGRAM

The EIS shall include a framework upon which compliance and effects monitoring will be based throughout the life of the Project, including eventual abandonment. This section of the EIS must provide information on all proposed monitoring programs and a framework for actions to be taken to respond to monitoring results, including plans for a formal follow-up program pursuant to the *Canadian Environmental Assessment Act* to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures.

10.1 Monitoring

The Proponent must describe the bio-physical and socio-economic monitoring programs to be incorporated into all phases of the Project in order to ensure that regulatory requirements are met, sustainable development objectives are advanced and that adverse environmental effects are avoided or minimized. The Proponent must describe how the results of monitoring programs will be used to refine or modify the design and implementation of management plans, enforcement and penalties for non-compliance, and mitigation measures and Project operations.

The proposed approach for monitoring must be described. The Proponent must explain the reasons for any cases where it is not possible to specify the details of a monitoring program in the complete EIS that is submitted to the Panel. The Proponent must explain when and how the program will be defined, and when it will be reviewed by public and regulatory agencies.

This description must include:

a. the objectives of the monitoring program and a schedule for collection of the monitoring data required to meet these objectives;
b. the relationship of the various components of the monitoring program to specific regulatory requirements;
c. the selection of the subjects and indicators to be monitored, and the criteria used in their selection including, the role played by ecological risk monitoring in determining subjects and indicators;
d. the frequency, duration and geographic extent of monitoring and the justification for these decisions;
e. approaches and methods used to analyze monitoring data;
f. reporting and response mechanisms, including criteria for initiating a response, and the procedures to be followed. The reasons for selecting these criteria must be explained;
g. the approaches and methods used to analyze monitoring data;
h. integration of monitoring results with other aspects of the Project including, adjustments for operating procedures and refinement of mitigation measures;
i. procedures to assess the effectiveness of monitoring programs, mitigation measures, and recovery programs for areas disturbed by the Project;
j. sources of funding for all monitoring programs; and
k. quality assurance and quality control measures to be applied to monitoring programs.

The Proponent must provide a table showing all VECs and indicate where monitoring is proposed.

10.2 Follow-Up Program

A follow-up program is a formal, ongoing process to verify the accuracy of the environmental assessment of the Project and determine the effectiveness of mitigation measures. If either of these two steps identify unforeseen adverse environmental effects, then the existing mitigation measures must be adjusted or, if necessary, new mitigation or compensation measures must be developed.

The Proponent must identify from their perspective:

a. the need for such a follow-up program and its objectives;
b. how it will be structured including, enforcement and penalties for non-compliance;
c. which elements of the monitoring program described in Section 10.1 it would incorporate;
d. the roles to be played by the Proponent, regulatory agencies, and others in such a program;
e. possible involvement of independent researchers;
f. the sources of funding for the programs; and