



FINAL REPORT

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4.0 ENVIRONMENTAL ASSESSMENT SCOPE AND METHODOLOGY

4.1 INTRODUCTION

Given that both the provincial and federal environmental assessment legislation are triggered, the federal and provincial regulators have agreed to review the Project proposal jointly and to harmonize the respective assessment processes. The harmonization process has been established and is governed by a Memorandum of Understanding (MOU) of 20 March 2008. The “harmonized” assessment requirements have been formulated in an Environmental Assessment Information Requirement Document (Appendix 1.0-A).

The assessment scope and methodology for the Project have been developed to satisfy regulatory requirements of the federal CEEA (Screening level Environmental Assessment) and the provincial Environmental Assessment Regulations (Class 1 Environmental Assessment Registration) and to address the specifics of the above mentioned MOU and Environmental Assessment Information Requirement Document.

4.2 SCOPE

A scoping process focuses the environmental assessment on the Project components and activities to be assessed, the key environmental issues, and the appropriate spatial and temporal boundaries. The scope of the assessment must be established early in the process to ensure that the analysis remains focused and manageable. The scoping process for this assessment has included the following:

- Preliminary research, which included a review of existing literature on the Project site and surrounding area, as well as other relevant scientific research publications and regulatory documents;
- A review of the Environmental Assessment Information Requirement Document and other regulatory requirements, as well as consultations with regulators and other government officials (see Section 1.3 Regulatory Overview);
- Public consultation, which was incorporated as part of the ongoing public consultation process for the Project and is described in Section 3.0 of this document;
- Communication with First Nations, including preliminary discussion regarding the Project and the development of an MKS (see Section 3.0); and
- Professional judgment of the EIS study team as an important component of the scoping exercise.

The results of the scoping exercise are presented through Sections 4.4 to 4.6.

4.3 PROJECT COMPONENTS

The scope of the proposed Project includes all of the works and activities associated with the construction, operation, and decommissioning phases of the Project. The Project components and activities are detailed in Section 2.0 of this report. Time lines associated with the three phases are discussed in Section 2.1.4.

Included in the Project components to be assessed are also potential accidental events and malfunctions that may occur in relation to the Project. These are described in detail in Section 8.

4.4 ENVIRONMENTAL COMPONENTS, VECS

4.4.1 VEC Identification

A preliminary set of environmental and socio-economic components of concern (ECCs/SCCs) were identified, based on issues that had been highlighted through the public consultation process, First Nations dialogue, and regulatory review. Some of these issues were identified in the provincial and federal Environmental Assessment Information Requirement Document, as well as other Project documents. These were further refined using the professional judgment of the EIS study team, and are presented in Table 4.5-1.

Potential interactions between the Project components and activities and the ECCs/SCCs were evaluated using a pathway analysis methodology (Table 4.5-1). Pathways for construction, operation, decommissioning/abandonment activities, and potential accidental events for each of the Project components were examined. Table 4.5-1 summarizes the rationale for exclusion or inclusion of ECCs as VECs. Where no meaningful interaction or impact pathway was identified, the issue was deemed not to be relevant to the assessment and scoped out of the analysis. Where clear interactions or pathways between ECCs and SCCs, and the Project activities were identified, they became the VECs on which the assessment is focused.

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Table 4.5-1: Scoping, Pathway Analysis and VEC Identification

Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
SOILS & SEDIMENTS	SOIL QUALITY	X		<ul style="list-style-type: none"> • Loss of top-soil • Exposure of bedrock and acid rock drainage • Soil contamination due to accidental spills and release of contaminants from loading/unloading accidents/ breaking open of containers 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute / regulation • Public concern • Air quality regulations for dust
	SEDIMENTS - MARINE ENVIRONMENT	X		<ul style="list-style-type: none"> • Increased concentrations in contaminants due to sediment disruption and site run-off 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute / regulation • Public concern • <i>Fisheries Act</i>
	SEDIMENTS– FRESHWATER ENVIRONMENT	X		<ul style="list-style-type: none"> • Increased concentrations in contaminants due to sediment disruption and site run-off 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute / regulation • Public concern • <i>Fisheries Act</i>
ATMOSPHERIC ENVIRONMENT	CLIMATE AND ATMOSPHERIC CONDITIONS <ul style="list-style-type: none"> • Climate Change and Greenhouse Gases • Microclimate change 	X		<ul style="list-style-type: none"> • Exhaust emissions from on-site operation of heavy equipment. • Exhaust emissions from train and road traffic. • Exhaust emissions from container vessels • Change in topography 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute / regulation • Public concern

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Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
	AIR QUALITY – INCLUDING: <ul style="list-style-type: none"> Emissions from combustion exhausts Dust 	X		<ul style="list-style-type: none"> Exhaust emissions from on-site operation of heavy equipment. Exhaust emissions from train and road traffic. Fugitive dust from site preparation and earthwork. Exhaust emissions from container vessels 	X		Included as a VEC: <ul style="list-style-type: none"> Protected by statute / regulation Public concern
ACOUSTIC ENVIRONMENT	CONSTRUCTION NOISE	X		<ul style="list-style-type: none"> Operation of heavy equipment (e.g., site clearing, earthwork, grading) Sheet pile driving Noise effects on near-by human receptors 	X		Included as a VEC: <ul style="list-style-type: none"> Municipal Bylaw; Provincial noise guidelines
	OPERATIONAL NOISE	X		<ul style="list-style-type: none"> Berthing of ships Loading/unloading of container ships Loading/unloading of containers via rail or truck Rail operation 	X		Included as a VEC: <ul style="list-style-type: none"> Public concern
	UNDERWATER NOISE	X		<ul style="list-style-type: none"> Sheet pile driving Vessel movement at site during construction Berthing/deberthing of ships Effects on marine mammals 	X		Included as a VEC: <ul style="list-style-type: none"> Provincial noise guidelines Public concern Marine mammals protected under (<i>Species at Risk Act</i>)
OCEANOGRAPHIC CONDITIONS	CURRENTS	X		<ul style="list-style-type: none"> Wharf may cause change in currents at and near site 	X		Included as a VEC: <ul style="list-style-type: none"> Public concern
	SEDIMENT TRANSPORT	X		<ul style="list-style-type: none"> Infill and dredging activities Marginal wharf may change sediment transport, erosion and deposition at and near site Propeller wash may change current sedimentation patterns 	X		Included as a VEC: <ul style="list-style-type: none"> Public concern

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Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
GROUNDWATER RESOURCES	QUALITY AND QUANTITY	X		<ul style="list-style-type: none"> Alteration of infiltration and runoff characteristics. Alteration of groundwater flow due to change of infiltration Alteration of water supply in near-by wells (quantity and quality) Effects on groundwater quality through infiltration of contaminated surface water 	X		Included as a VEC: <ul style="list-style-type: none"> Protected by statute/regulation Public concern
SURFACE WATER (FRESHWATER AND MARINE ENVIRONMENT)	FRESHWATER ENVIRONMENT -QUALITY AND QUANTITY	X		<ul style="list-style-type: none"> Site runoff quality Change in infiltration/runoff coefficient Discharge of treated water Change in drainage patters, i.e., diversion of site run off from or to stream courses Accidental discharges (fuel spills, leaks in container) Train and/or truck traffic accident associated with spills to freshwater-environment Acid rock drainage 	X		Included as a VEC: <ul style="list-style-type: none"> Protected by statute/regulation Public concern
	MARINE ENVIRONMENT - QUALITY			<ul style="list-style-type: none"> Direct and indirect (via water courses) discharges from site Discharges from on-site spills and accidents Accidental fuel discharges from vessels Ballast water discharges at wharf (not considered part of routine operations) Accidental vessel grounding or berthing accident involving spills Accident during container loading/unloading with release of harmful substances into marine environment 	X		Included as a VEC: <ul style="list-style-type: none"> Protected by statute/regulation

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Table 4.5-1: Scoping, Pathway Analysis and VEC Identification

Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
MARINE ENVIRONMENT	MARINE HABITAT	X		<ul style="list-style-type: none"> • HADD as a result of the wharf development and wharf and vessel operation • Short-term effects on habitat from spills and other malfunctions and accidents in marine and/or terrestrial environment 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute/regulation (<i>Fisheries Act</i>) • Public concern
	MARINE BIOTA (INCL. MARINE MAMMALS)	X		<ul style="list-style-type: none"> • Effects on biota as a result of changes to marine habitat (may include physical characteristics, water and sediment quality, under water noise levels, effects of propeller wash) • Effects on species as a result of blasting • Effects on species as a result of malfunctions and accidents (e.g., fuel spills) 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute/regulation (<i>Fisheries Act</i>) • Public concern
	MARINE SPECIES AT RISK (INCL. MARINE MAMMALS)	X		<ul style="list-style-type: none"> • HADD; i.e., effects on biota as a result of changes to marine habitat (may include physical characteristics, water and sediment quality, under water noise levels, effects of propeller wash)) • Effects on biota as a result of underwater noise levels (incl. noise from blasting) • Effects on species as a result of malfunctions and accidents (e.g., fuel spills) 	X		<ul style="list-style-type: none"> • Protected by statute/regulation (<i>Species at Risk Act</i>) • Public concern
FRESHWATER ENVIRONMENT	FRESHWATER FISH HABITAT	X		<ul style="list-style-type: none"> • Habitat alteration, disturbance and /or destruction (HADD) • Short-term effects on freshwater habitat from on-site spills and other malfunctions and accidents (incl. rail and road accidents) 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute/regulation

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Table 4.5-1: Scoping, Pathway Analysis and VEC Identification

Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
	FRESHWATER FISH	X		<ul style="list-style-type: none"> • HADD; i.e., effects on biota as a result of changes to freshwater habitat • Effects on species as a result of blasting • Effects on species as a result of new barriers to fish migration • Direct effects on species as a result of malfunctions and accidents (e.g., fuel spills; incl. rail and road accidents) 	X		<ul style="list-style-type: none"> • Protected by statute/regulation (<i>Fisheries Act</i>) • Public concern
	FRESHWATER FISH SPECIES AT RISK	X		<ul style="list-style-type: none"> • HADD; i.e., effects on biota as a result of changes to marine habitat • Effects on biota as a result of underwater noise levels (incl. noise from blasting) • Effects on species as a result of new barriers to fish migration • Direct effects on species as a result of malfunctions and accidents (e.g., contamination from spills; incl. rail and road accidents) 	X		<ul style="list-style-type: none"> • Protected by statute/regulation (<i>Species at Risk Act</i>) • Public concern
TERRESTRIAL ENVIRONMENT	FLORA	X		<ul style="list-style-type: none"> • Site clearing and development activities • Transmission and rail corridor development • Changes in site drainage with effects on off-site habitat/vegetation communities • Spills and other malfunctions and accidents with the potential to affect habitat and to directly affect plant individuals. 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute/regulation



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		Yes	No		Yes	No	
	BIRDS INCLUDING: ○ WATERFOWL ○ SHOREBIRDS ○ PASSERINE ○ RAPTORS ○ BREEDING BIRDS			<ul style="list-style-type: none"> • Vegetation clearing/ bird habitat removal or alteration as a result of clearing and development activities for the site, rail and transmission corridors • Noise effects (disruption; startling) from construction and operating activities • Lighting effects and bird collisions with equipment and structures • Disruption of nesting activities (noise, movement) • Disruption of wintering shorebirds (vessel maneuvering, loading noise) • Spills and other malfunctions and accidents with the potential to affect habitat (e.g., oil spills) 	X		<ul style="list-style-type: none"> • Protected by statute/regulation (<i>Migratory Bird Convention Act, NS Wildlife Act</i>) • Public concern
	WILDLIFE (INCLUDING MAMMALS)	X		<ul style="list-style-type: none"> • Vegetation clearing/ wildlife habitat removal or alteration as a result of clearing and development activities for the site, rail and transmission corridors • Noise effects (disruption; startling) from construction and operating activities • Spills and other malfunctions and accidents with the potential to affect habitat (e.g., oil spills) 	X		Included as a VEC: <ul style="list-style-type: none"> • Protected by statute/regulation • Public concern

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Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
	WETLANDS	X		<ul style="list-style-type: none"> Wetland removal or alteration as a result of clearing and development activities for the site, rail and transmission corridors Alteration of site drainage and implications for near-by watercourses/wetland habitat Alteration of water quality (e.g., increased nutrient intake) Temporary increase in contaminant levels (malfunction and accident scenarios with contaminant discharges) 	X		<ul style="list-style-type: none"> Protected by statute/regulation (<i>NS Environment Act</i>) Public concern
	SPECIES AT RISK	X		<ul style="list-style-type: none"> All factors listed under Terrestrial Environment 	X		Included as a VEC under Vegetation and Wildlife: <ul style="list-style-type: none"> Protected by statute/regulation (<i>Species at Risk Act, NS Endangered Species Act</i>) Public concern
SOCIO-ECONOMIC ENVIRONMENT	ABORIGINAL RESOURCES AND LAND USE	X		<ul style="list-style-type: none"> Current use of lands and resources for traditional purposes by Aboriginal People at the Project site will be limited due to access restrictions and habitat changes 	X		Included as a VEC: <ul style="list-style-type: none"> Protected by statute/regulation Public concern
	PLANNED LAND USES (PLANNING STRATEGY)	X		<ul style="list-style-type: none"> No adverse interaction identified. Project is within proposed future land use designation/zoning 		X	Not Included as a VEC: <ul style="list-style-type: none"> No adverse interaction identified – project complies with existing land use designation/zoning

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Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
	LABOUR AND ECONOMY	X		Project is expected to have beneficial effects: <ul style="list-style-type: none"> • Increased employment opportunities • Increased municipal tax contributions • Increased spending power • Diversification in local labour market 	X		Included as a VEC: <ul style="list-style-type: none"> • Potential economic benefit • Public Concern
	FISHERIES AND AQUACULTURE	X		Potential for effects related to: <ul style="list-style-type: none"> • damage of fishing gear from container vessel traffic; • habitat loss, reduced fish populations, loss of income • accidental spills affecting aquaculture operations 	X		Included as a VEC: <ul style="list-style-type: none"> • Potential economic impact • Public Concern
	PROPERTY VALUE (RESIDENTIAL)	X		<ul style="list-style-type: none"> • Construction activities can temporarily affect neighboring property values as a result of traffic, noise, dust, etc. • Economic growth in area can lead to increase in residential property values. 	X		Included as a VEC: <ul style="list-style-type: none"> • Public concern
	RECREATION	X		<ul style="list-style-type: none"> • Recreational uses could be affected by noise, dust, lighting, and changes in landscape aesthetics 	X		Included as a VEC: <ul style="list-style-type: none"> • Public concern
	MUNICIPAL INFRASTRUCTURE AND SERVICES (INCL. ROAD AND RAIL SERVICES, TREATMENT SYSTEMS, EMERGENCY RESPONSE ETC)	X		<ul style="list-style-type: none"> • Increased pressure on road infrastructure; • Potential increased demand on emergency response services. 	X		Included as a VEC: <ul style="list-style-type: none"> • Public concern

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Environment/ Resource	Environmental Components of Concern (ECC)	Pathway of Concern/ Project- Environment Interaction		Possible Pathways/Project-Environment Interactions	Determined to be a VEC?		Key Rationale for Inclusion/Exclusion as Valued Environmental (VEC)
		Yes	No		Yes	No	
	MARINE TRAFFIC AND NAVIGATION	X		<ul style="list-style-type: none"> Increased risk of accidents (navigational safety) 	X		Included as a VEC: <ul style="list-style-type: none"> <i>Navigable Waters Protection Act</i>
	VISUAL AESTHETICS	X		<ul style="list-style-type: none"> Permanent built project features (wharf, cranes, storage yard, buildings) are likely to change landscape aesthetics 	X		Included as a VEC: <ul style="list-style-type: none"> Public concern
	ARCHAEOLOGY AND HERITAGE RESOURCES	X		<ul style="list-style-type: none"> Potential disturbance of unknown archaeological resources during excavation and tilling activities 	X		Included as a VEC: <ul style="list-style-type: none"> Protected by statute/ regulation
	COMMUNITY HEALTH AND WELL BEING	X		<ul style="list-style-type: none"> Interactions with social environment (labour market conditions, income situations, access to municipal services) and physical environment (noise, environmental quality, landscape aesthetics) Country foods (e.g., fish, shellfish, wild game, garden produce, berries etc.) (if currently harvested at or near the site, could potentially be affected as a result air emissions or accidental spills at / near the project site and act as pathways to human health. 	X		Included as a VEC: <ul style="list-style-type: none"> Public Concern

4.5 BOUNDARIES

Boundaries are established to provide for a meaningful and manageable focus for the assessment. They are also an aid in determining the most effective use of available study resources. The boundaries established in the context of this EIS include:

- **Project Boundaries** define the extent of the Project, both spatially and temporally. The Project site is identical for all VECs and involves the footprint and boundary of the future Project as described in Section 2 (Project Description); it includes the
 - MITI site (as defined by future fence line); and
 - associated rail and transmission corridors.

The temporal project boundaries are set by the Project schedule and are applicable to all VECs and also established in the Project description.

- **Ecological boundaries:** are determined by the spatial and temporal distributions of the biophysical VECs under consideration. Spatial ecological boundaries may be limited to the Project site and adjacent lands, or may extend well beyond the immediate footprints as the distribution and/or movement of an environmental component can be local, regional, national, or international in extent. Such factors as population characteristics and migration patterns are important considerations in determining ecological boundaries, and may influence the extent and distribution of an environmental effect. Temporal ecological boundaries consider the relevant characteristics of environmental components or populations, including the natural variation of a population or ecological component, response and recovery times to effects and any sensitive or critical periods of a VEC's life cycle (e.g., spawning, migration), where applicable.

Ecological spatial and temporal boundaries for this assessment are described for each biophysical VEC in Section 6.0.

- **Socio-economic boundaries** are determined by the nature of the socio-economic VECs under consideration (e.g., the spatial distribution of fishing activity). Temporal socio-economic boundaries also include consideration of natural variation in socio-economic components or systems, response and recovery times, and any particularly important periods (e.g., recreation seasons).

Socio-economic spatial and temporal boundaries for this assessment are described in Section 7.0 for each VEC.

- **Administrative and legislative boundaries** are the spatial and temporal dimensions imposed on the assessment for political, socio-cultural, or economic reasons. Spatial administrative boundaries can include such elements as the way in which natural and/or socio-economic systems are managed (e.g., Northwest Atlantic Fisheries Organization (NAFO) Fishing Areas). Temporal administrative boundaries may include, for example, fishing seasons. Administrative boundaries also include those regulatory requirements that influence the Project and its implementation.

The Project is regulated under the jurisdiction of the Province of Nova Scotia as well as the Federal government. Legislation and regulations pertaining to both are described in Section 1.4 “Regulatory Overview”. These requirements are taken into account and, if required, expanded upon for each VEC in Sections 6 and 7 respectively.

- **Technical boundaries** represent any technical limitations on the ability to assess, evaluate, and/or monitor potential environmental effects. For example, insufficient data or data gaps on the abundance, status, and distribution of a fish or wildlife population may limit the ability to predict the potential effects of a proposed development on it. Where such limitations exist, it is important that they be recognized and acknowledged. Technical boundaries for this assessment will be determined where necessary for each VEC and addressed in Sections 6 and 7 respectively.

4.6 ANALYSIS, MITIGATION AND ENVIRONMENTAL EFFECTS EVALUATION

For each VEC, the potential interactions are investigated and evaluated based on current scientific knowledge with regard to each interaction. The effects are characterized as either “positive” or “adverse.” Effects are analyzed qualitatively, and, where possible, quantitatively, using existing knowledge, professional judgment, and appropriate analytical tools.

For adverse effects, mitigation measures are identified and the significance of the predicted environmental effects of the Project are evaluated based on a set of defined environmental effects thresholds of significance (Section 4.7.1). For beneficial effects, enhancement measures are developed but no determination of significance is conducted.

Environmental effects are evaluated for each VEC as either significant or not significant, based on the significance criteria (see below), and summarized in table form.

4.6.1 Evaluation of Significance

The significance evaluation of residual adverse effects for each VEC is based on the criteria as specified by the Canadian Environmental Assessment Agency (1994, 1997), including:

Magnitude the nature and degree of the predicted environmental effect. Rating depends on the nature of the VEC and the potential effect. For biophysical/ecological VECs the rating system is as follows:

<i>Low</i>	Affects a specific group or critical habitat for one generation or less; within natural variation;
<i>Medium</i>	Affects a portion of a population or critical habitat for one or two generations; temporarily outside the range of natural variability;
<i>High</i>	Affects a whole stock, population or critical habitat (may be due to the loss of an individual(s) in the case of a species at risk) outside the range of natural variability.

For socio-economic VECs the magnitude of potential effect is defined as:

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<i>Low</i>	Does not have a measurable effect on valued socio-economic components;
<i>Medium</i>	Has a measurable effect on socio-economic components, but is temporary and/or is highly localized;
<i>High</i>	Has a measurable and sustained adverse effect on socio-economic components.

Geographic extent	The area over which the particular effect will occur.
Frequency	How often the effect will occur.
Duration	How long the disturbance will occur.
Reversibility	The ability of a VEC to return to an equal, or improved, condition once the disturbance has ended (for example, reclaiming habitat area equal or superior to that lost). Predicted effects are rated as reversible or irreversible, based on previous research and experience.

4.6.2 Thresholds for Determination of Significance

Section 16(1)(b) of CEAA requires that the significance of environmental effects be determined. Accepted practice in meeting this requirement involves establishing and applying a threshold for the determination of significance. Residual environmental effects significance thresholds have been established based on information obtained in issues scoping, available information on the status and characteristics of the VEC, and may involve the application of environmental standards, guidelines or objectives, where these are available (e.g., applicable ambient air quality guidelines). Consideration of the carrying capacity, tolerance level, or assimilative capacity of the area or VEC may be helpful, even though it may not be possible to quantify these characteristics.

In general, significant environmental effects on VECs are those adverse effects that are rated high in magnitude and which extend beyond local boundaries, occur frequently or permanently, and are not reversible.

Where VEC-specific significance thresholds have been applied, these are defined in Sections 6.0 and 7.0. Environmental effects are evaluated for each VEC as either significant or not significant, based on the significance criteria, and summarized in table form.

4.6.3 Likelihood of the Effect

For all Project-environment interactions where an adverse effect has been evaluated “significant,” the likelihood of this effect to occur is determined. The determination of “likelihood” is based on expert judgment or quantitative risk assessment.

4.7 FOLLOW-UP AND MONITORING

Section 16(2)(c) of CEAA requires consideration of the need for, and requirements of, any follow-up studies. Follow-up and EEM programs provide essential feedback, in particular with respect to: predicted Project effects; unanticipated effects; the necessity and efficacy of Project management strategies; and cumulative effects. It allows environmental managers to adapt follow-up procedures to the situation and implement an adaptive management approach.

Monitoring by the proponent may be undertaken for a number of reasons including regulatory or corporate compliance (environmental compliance monitoring), evaluation of mitigating measures, strengthening predictive capacity in future EISs, and commitments to third parties.

Monitoring and follow-up requirements are evaluated for each VEC and are linked to the sensitivity of a VEC to both Project-related and cumulative environmental effects. The likelihood and importance of such effects, as well as the level of confidence associated with the adverse residual effects rating, are also taken into consideration.

4.8 CUMULATIVE EFFECTS

Subsection 16(1)(a) of the CEAA requires that every screening of a project include an assessment of the “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.” This assessment considers the regional context for each VEC to identify potential cumulative effects with other projects and activities in accordance with the Cumulative Effects Assessment Practitioners Guide (Canadian Environmental Assessment Agency, 1999a,b).

In accordance with the EIS Guidelines (Canadian Environmental Assessment Agency, 2005), the Cumulative Effects Assessment (CEA) conducted for the Project includes five components:

- scoping (identification of other projects) ;
- analysis of effects;
- identification of mitigation measures
- determination of significance of residual adverse effects; and
- follow-up (monitoring) measures to verify effect predictions and effectiveness of mitigation measures.

The scoping exercise involves the identification of other Projects that may have the potential to interact with the proposed undertaking. If a potential interaction is identified, the environmental effects are analyzed in a similar fashion as in the effects assessment of the Project works and activities.

4.9 POTENTIAL EFFECTS OF THE ENVIRONMENT ON THE PROJECT

The definition of effects of the environment on the Project under Section 2(1) of CEAA includes “any change to the Project that may be caused by the environment.” This may include climate change and weather patterns, extreme weather events, and seismic activity.

4.10 MALFUNCTIONS AND ACCIDENTS

The objective of the assessment of possible environmental effects of malfunctions and accidents are to ensure that:

- abnormal events and/or operational upset conditions are considered;
- credible events are identified; and
- the significance of the residual effects (i.e., after mitigation) of such events is determined.

The focus of the assessment is on those events that are considered credible in the context of the specific Project. It is not the intent of the EIS to address all conceivable abnormal occurrences, but rather, to address only those that have a reasonable probability of occurring (considering the specific aspects of site conditions and Project design) that may have an environmental effect or consequence.

The assessment of likely effects associated with accidents and malfunctions is conducted in three steps. This involves the identification of credible scenarios, a screening of scenarios requiring an effects assessment, and an effects assessment.

In the effects assessment, credible malfunctions and accident scenarios are assessed in the same manner, and using the same assessment criteria, as for the effects assessment of the normal construction and operational works and activities. The objective of this assessment is to determine if the scenario could reasonably be expected to result in a significant residual environmental effect.

4.11 SUMMARY OF RESIDUAL ENVIRONMENTAL EFFECTS

Adverse environmental effects on each VEC are summarized, as well as any adverse environmental effects that might result from malfunctions or accidents. This section also addresses the likelihood of all predicted significant adverse residual effects.