Canadian Environmental Assessment Agency
Agence canadienne d'évaluation environnementale

Comprehensive Study Report

Canpotex Potash Export Terminal and Ridley Island Road, Rail, and Utility Corridor

Canadian Environmental Assessment Agency

September, 2012

Canada

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Executive Summary

Canpotex Terminals Limited (Canpotex) and the Prince Rupert Port Authority (PRPA), collectively referred to as the proponent, are each proposing to undertake projects on Ridley Island in the Port of Prince Rupert, British Columbia. Canpotex is proposing to construct and operate a potash export terminal (the Canpotex Potash Export Terminal) and the PRPA is proposing to construct the enabling transportation infrastructure and utilities (Ridley Island Road, Rail, and Utility Corridor). The Canpotex Potash Export Terminal will have the capacity to export up to 11.5 million tonnes of potash annually. The Ridley Island Road, Rail, and Utility Corridor will service the Canpotex facility as well as other future developments on Ridley Island. Together, the Canpotex Potash Export Terminal and the Ridley Island Road, Rail, and Utility Corridor are referred to as "the Project," and a single environmental impact statement (EIS) has been completed for this project.

In order to enable the Project to proceed, the PRPA may issue a lease of federal lands; TC may provide funding and issue an approval under the *Navigable Waters Protection Act*; Fisheries and Oceans Canada (DFO) and Environment Canada (EC) may issue authorizations under the *Fisheries Act* and *Canadian Environmental Protection Act, 1999*, respectively.

Under the *Canadian Environmental Assessment Act* (the Act) and the *Comprehensive Study List Regulations*, a comprehensive study of the Project is required before these authorizations, approvals, funding and lease can be issued. The Project is considered a major resource project and is therefore subject to the provisions of the *Cabinet Directive on Improving the Performance of the Regulatory System for Major Resource Projects*.

The Canadian Environmental Assessment Agency (the Agency) prepared this comprehensive study report in consultation with TC, DFO and EC following a technical review of the proponent's EIS and an evaluation of the environmental effects of the Project. TC, DFO, EC, and Health Canada (HC) provided advice related to their fields of expertise.

Valued ecosystem components (VECs) are notable features of the natural and human environment that are likely to be impacted by the Project. The EIS identified and assessed the Project's VECs; these include air quality, noise and vibration, ambient light, vegetation resources, wildlife and wildlife habitat, aquatic environment, human health, archaeological and heritage resources, current use of lands and resources for traditional purposes by Aboriginal persons and navigable waters.

Based on the analysis of the nature of the proposed Project and its predicted effects on the VECs, the Agency evaluated the potential for this project to have significant adverse impacts on the environment. This evaluation was completed based on technical information provided by the proponent, advice provided by federal and provincial experts, and comments provided by Aboriginal groups and the public through various consultation opportunities.

The potential environmental effects of greatest concern identified during the comprehensive study process included the impacts resulting from disposal at sea of dredged material, the impacts to navigation, and the impacts on fish and fish habitat. Additional concerns related to on-site land disposal, impacts on whales from vessel collisions, effects on archaeological resources, and loss of wetlands.

Methods to reduce or eliminate the Project's potential environmental effects were incorporated into the overall planning and design. The following measures were included to reduce or eliminate the Project's potential adverse environmental effects:

- reducing the marine footprint by decreasing the terminal causeway length by 216 metres,
- developing wetland and fish habitat compensation, and
- limiting vehicular traffic between Prince Rupert and Ridley Island through use of buses, crew cab trucks and other options for group transportation when practical.

A follow-up program is required and has been developed under the Act to verify the accuracy of the environmental assessment and to determine the effectiveness of the proposed mitigation measures for this Project.

Taking into account the implementation of the proposed mitigation measures, the follow-up program and the adherence to conditions and requirements related to the necessary federal permits, authorizations and approvals, the Agency concludes that the Project is not likely to cause significant adverse environmental effects.

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List of Acronyms and Short Forms

the Act	Canadian Environmental Assessment Act
BC	British Columbia
BCEAA	BC *Environmental Assessment Act*
BCMOE	BC Ministry of Environment
BC MWLAP	BC Ministry of Water Land and Air Protection
CACs	criteria air contaminants
CCME	Canadian Council of Ministers of the Environment
CD	chart datum
CDC	Conservation Data Centre
CEA	cumulative effects assessment
CMT	culturally modified trees
CNR	Canadian National Railway
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPAEAR	Canada Port Authority Environmental Assessment Regulations
CWH	coastal western hemlock
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
DWT	dead weight tonnes
EC	Environment Canada
EHS	Environmental Health and Safety
EIS	Environmental Impact Statement
EISG	Environmental Impact Statement Guidelines
EMP	Environmental Management Program
EPRP	Emergency Preparedness and Response Plan
FA	federal authority
FPWC	Federal Policy on Wetland Conservation
FVN	Fairview Terminal North
FVS	Fairview Terminal South
GHGs	greenhouse gases
ha	hectares
HADD	Harmful Alteration, Disruption or Destruction
HCA	*Heritage Conservation Act*
HCP	habitat compensation plan
km	kilometre
kV	kilovolt
LAA	local assessment area

List of Acronyms and Short Forms (cont'd)

LRMP	Land and Resource Management Plan
m	metres
MBCA	*Migratory Birds Convention Act*
NWPA	*Navigable Waters Protection Act*
OR	Oregon, United States
PAH	polycyclic aromatic hydrocarbons
PM	particulate matter
PRG	Prince Rupert Grain
PRPA	Prince Rupert Port Authority
RA	responsible authority
RAA	regional assessment area
RRUC	Ridley Island Road, Rail, and Utility Corridor
RTI	Ridley Island Terminals
SARA	*Species at Risk Act*
TC	Transport Canada
tpy	tonnes per year
TUS	Traditional Use Study
VEC	Valued Ecosystem Component
WA	Washington State, United States

1. Introduction

1.1 Project Overview

Canpotex Terminals Limited (Canpotex) and the Prince Rupert Port Authority (PRPA) are each proposing to undertake projects on Ridley Island in the Port of Prince Rupert, British Columbia (see figure 1-1). Canpotex and PRPA are collectively referred to as the proponent. Canpotex is proposing to construct and operate the Canpotex Potash Export Terminal and the PRPA is proposing to construct the Ridley Island Road, Rail and Utility Corridor (RRUC). The Canpotex Potash Export Terminal will have the capacity to export up to 11.5 million tonnes of potash annually. The Canpotex facility and the RRUC are jointly referred to as "the Project".

1.2 Environmental Assessment Context and Process

1.2.1 Purpose of the Comprehensive Study Report

This report presents the Canadian Environmental Assessment Agency's (the Agency) analysis to determine whether the Project is likely to cause significant adverse environmental effects. The Minister of the Environment will consider this report and comments received from the public and Aboriginal groups before announcing the environmental assessment decision statement.

Table 1-1: Project Summary

Project Summary	Canpotex Potash Export Terminal will have the capacity to export up to 11.5 million tonnes of potash annually. The Ridley Island Road, Rail and Utility Corridor (RRUC) will service the Canpotex facility as well as other future developments on Ridley Island.
Proponent	Canpotex Terminals Limited 1111 – 100 Park Royal South West Vancouver, BC V7T 1A2 Attention: Tyler McDougall, Manager, Capital Projects E-mail: tyler.mcdougall@canpotex.com and Prince Rupert Port Authority 200 – 215 Cow Bay Road Prince Rupert, BC V8J 1A2 Attention: Lorne Keller, Vice-President, Project Development E-mail: lkeller@rupertport.com
Location	The Project will be located on Ridley Island, Prince Rupert, BC. Coordinates at the centre of the proposed terminal footprint are 54.21601° latitude and 130.34928° longitude. In UTM coordinates the site is located in zone 9 at 414209 E and 6008987 N.
Environmental Assessment Contact	Canpotex Potash Export Terminal and Ridley Island Road, Rail, and Utility Corridor Project, Canadian Environmental Assessment Agency 410-701 West Georgia Street Vancouver BC V7Y 1C6 Attention: Jack Smith E-mail: Canpotex@ceaa-acee.gc.ca
Canadian Environmental Assessment Registry (CEAR)	http://www.ceaa-acee.gc.ca/050/details-eng.cfm?evaluation=47632 File number: 47632

Figure 1-1: Project Location

The Minister may request additional information or require that public concerns be addressed further before issuing the environmental assessment decision statement. Following the environmental assessment decision statement, the Minister will refer the Project back to Fisheries and Oceans Canada (DFO), Transport Canada (TC) and Environment Canada (EC), for appropriate action under section 37 of the Act.

1.2.2 Federal Environmental Assessment Process

The *Canadian Environmental Assessment Act* (the Act)[1] applies to federal regulatory authorities when they contemplate certain actions or decisions that would enable a project to proceed in whole or in part.

An environmental assessment is required under the Act due to actions that may be undertaken

[1] The *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force on July 6, 2012, replacing the *Canadian Environmental Assessment Act* S.C. 1992, c. 37. Section 125 of CEAA 2012 sets out transition measures for comprehensive studies, such as the Canpotex Project, which were commenced under the former Act. For this project, all references to federal environmental assessment legislation reflect the requirements and regulations of the *Canadian Environmental Assessment Act* S.C. 1992, c. 37

by the PRPA, DFO, EC and TC. The PRPA is the proponent for the road, rail and utility corridor and will also issue a lease of federal lands to enable the Project to proceed. DFO, TC and EC may issue permits, authorizations or approvals in relation to the project pursuant to the *Fisheries Act*, *Navigable Waters Protection Act* and the *Canadian Environmental Protection Act*, respectively. TC may provide funding for the road, rail, and utility corridor component of the Project.

Moreover, pursuant to paragraph 28(c) of the *Comprehensive Study List Regulations*, this project is subject to a comprehensive study environmental assessment under the Act:

"The proposed construction, decommissioning or abandonment of a marine terminal designed to handle vessels larger than 25,000 DWT unless the terminal is located on lands that are routinely and have been historically used as a marine terminal or that are designated for such use in a land-use plan that has been the subject of public consultation."

2. Project Description

2.1 Scope of the Project

The scope of this project for the purposes of the comprehensive study includes all physical works and activities associated with the construction, operation, modification, and decommissioning of the Project.

2.2 Project Components

The Canpotex Potash Export Terminal will include the following components:

- marine wharf, access trestle, causeway and an all weather ship loading facility capable of receiving vessels of up to 180,000 dead weight tonne (DWT)
- 180,000 tonne potash storage building, conveyor and dust collection systems
- automated railcar unloading and conveyor system, automated portal reclaim system and dust collection system
- stormwater and wash down water settlement pond and marine outfalls
- administration, personnel, maintenance, and storage buildings
- site services including water supply, electrical power distribution and sewage
- other applicable ancillary components located in the project area

Once fully operational, the terminal will have the capacity to export up to 11.5 million tonnes of potash annually.

The PRPA Road, Rail and Utility Corridor will include the following components:

- rail loop (between 8 and 8.5 km), consisting of a railbed for up to 14 inbound and 11 outbound tracks
- three inbound rail tracks and two outbound tracks laid for the Canpotex terminal
- approximately 69 kV transmission line (approximately 3.4 km) connecting Ridley Island and the Canpotex terminal to the BC Hydro power transmission system
- access road with a rail overpass and underpass
- lighting along the rail loop at spacings of 15 to 25 m
- rail causeway upgrade and culverts
- infilling of foreshore marine habitat along portions of the west and east side of Ridley Island and the base of Porpoise Harbour

2.2.1 Activities

The Project includes the following activities:

During construction:

- site preparation, including grubbing, stripping of overburden, blasting, rock crushing and screening, and grading of the project areas

- installation of utilities (electrical power, water, sewers, sewage treatment, fire protection water, wash-down water, stormwater, settling pond, small vehicle fuelling station, oil-water separator)
- construction of the marine terminal
- construction of the access road and railbed, the laying of the rail tracks dedicated to Canpotex terminal
- installation of a transmission line (approximately 69 kV)
- dredging and blasting at the berth
- disposal of dredge material at sea
- installation of pilings and pile caps
- construction of access trestle, causeway and berth
- installation of conveyor system, utilities and shiploader on the trestle and berth
- installation of the effluent disposal pipe and marine outfall
- implementation of fish habitat compensation plan and wetland compensation plan

During operations:

- continuous operation capabilities (24 hours a day and 365 days a year)
- conveying of potash from the storage building to the ships
- receiving and unloading of potash from unit trains to the storage building or for direct loading to the ship
- arrival and departure of vessels from berth
- periodic operation of back-up generation
- waste management
- vehicle fuelling
- infrastructure maintenance

During decommissioning:

- removal of the land-based above-ground infrastructure, the conveyor and shiploading equipment from the jetty and berth
- removal of the berth, causeway and access trestle
- removal of buildings and support structures

Prior to decommissioning, a decommissioning plan will be developed. At a minimum, the plan will include a schedule for equipment decommissioning and disassembly. The schedule will indicate the approximate time required to remove and dispose all abandoned installations, structures, and buildings for which on-site reuse is not possible and to reinstate the site to a quality necessary for subsequent industrial land use. Decommissioning planning will be developed in consideration of environmental goals for the area.

2.2.2 Schedule

The proposed schedule, summarized in Table 2-1, is subject to many factors that may affect the anticipated timing.

Table 2-1: Proposed Schedule for Potash Export Terminal and Road, Rail, and Utility Corridor

Project Component	Canpotex	PRPA
Site clearing	Q2 2014	Q4 2012
Start construction	Q2 2014	Q4 2012
Dredging and disposal at sea	Q3 2014 – Q1 2015	n/a
Pile placement	2015	n/a
Complete construction	Q4 2017	Q2 2014
Operation of terminal and RRUC*	2017 – 2067	2017–*
Decommissioning of terminal*	2067	n/a

NOTE: * The lifetime of the road, rail and utility corridor is indefinite.

3. Scope of the Environmental Assessment

The limits of an environmental assessment are established by a process called scoping. This focuses the study on relevant factors and concerns, which are later reported in a project scoping document.

3.1 Factors to be Considered

Pursuant to subsections 16(1) and 16(2) of the Act, the following factors must be considered as part of a comprehensive study:

- purpose of the project
- alternative means of carrying out the project that are technically and economically feasible, and the environmental effects of any such alternative means
- environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project, and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out
- effects on the capacity of potentially affected renewable resources to meet present and future needs
- significance of the effects
- comments received from the public in accordance with the Act and the regulations
- technically and economically feasible measures that would mitigate any significant adverse environmental effects of the project
- need for and requirements of any Follow-Up Program in respect of the project

In accordance with paragraph 16(1)(*e*) of the Act, the Agency determined that the assessment would include a description of the need for the project, an evaluation of alternatives to the project, and an articulation of the benefits to Canadians as a result of the environmental assessment process.

3.2 Scope of the Assessment

In determining significant environmental effects, the environmental assessment focuses on aspects of the natural and human environment that have particular value or significance and are likely to be impacted by the project. These aspects are termed valued ecosystem components (VECs).

Selection of VECs for the assessment was based on the environmental setting, professional judgment, and issues raised during consultations. The VEC selection process included consideration of the temporal and spatial scope of the Project and the anticipated Project-environment interactions. However, a full assessment of effects was not completed for VECs in the following circumstances:

- where there is no interaction with Project components or Project activities
- interaction occurs, but based on past experience and professional judgment, the interaction would not result in a significant environmental effect, even without mitigation
- where interaction occurs, but it would not result in a significant effect because the application of codified environmental protection practices would effectively mitigate the predicted environmental effect

Based on this rationale, the VECs considered in this assessment include the following:

- air quality
- noise and vibration
- ambient light
- vegetation resources (including rare vegetation and wetlands)
- wildlife and wildlife habitat (including species-at-risk and avifauna)
- aquatic environment (including both fresh and marine waters, and fish and fish habitat)

- human health (including country foods)
- archaeological and heritage resources
- current use of lands and resources for traditional purposes by Aboriginal persons
- navigable waters

For each selected VEC, one or more measurable parameters were identified to facilitate quantitative or qualitative measurement of potential project effects and cumulative impacts.

Measurable parameters provide a means to determine the level or amount of change to a VEC. For example, the current use by wildlife and the connectivity of their potentially affected habitat during construction and operations, were chosen as the measurable parameters for the alteration of movement of wildlife.

3.3 Temporal and Spatial Boundaries

The temporal boundaries of this environmental assessment are defined based on the timing and duration of project activities that could adversely affect the environment, heritage resources and human health. The purpose of the temporal boundaries is to identify when an effect may occur in relation to specific project phases and activities. Based on the proposed project schedule, the temporal boundaries for the assessment are:

- Construction commencing in fall 2012
- Operations commencing in spring 2016
- Decommissioning in 2067

The spatial boundaries for each VEC encompass the geographic extent over which the Project's potential environmental, heritage and human effects are expected to be measureable. These include the local assessment area (LAA) for consideration of direct effects on the selected VECs, and a regional assessment area (RAA) for consideration of cumulative effects. Spatial boundaries for each VEC are described in Table 3-1 and Table 3-2.

Local assessment area

The LAA boundary consists of the project footprint plus a buffer zone within which

Table 3-1: VECs and Local Assessment Boundaries

Valued Environmental Component	Local Assessment Area Boundary
Air quality	For the terminal, a 30 km by 30 km study area centered on the Canpotex terminal. For the rail corridor assessment, the LAA extended from Ridley Island to Lorne Creek
Noise and vibration	Ridley Island and the village of Port Edward
Ambient light	Ridley Island and the village of Port Edward
Vegetation resources	Ridley Island
Wildlife and wildlife habitat	Ridley Island and a 500 m buffer around the edge of the island
Aquatic environment	All freshwater habitats on Ridley Island, 500 m buffer around Coast and Ridley Islands and proposed disposal at sea sites
Human health	Same as air quality (in keeping with largest relevant VEC boundary)
Archaeological and heritage resources	Project footprint (i.e., area subject to physical ground disturbance) including the land based disposal site
Aboriginal groups' current use	Ridley Island and along the shipping lane between Ridley Island and the pilotage stations at Triple Islands
Navigable waters	Project jetty location and west along the shipping lane to the pilotage station

Table 3-2: Regional Assessment Area Boundaries

Valued Environmental Component	Regional Assessment Area Boundary
Air quality	Same as LAA (only one assessment area for air quality)
Noise and vibration	5 km buffer from Ridley Island and along the rail line to Lorne Creek
Ambient light	5 km buffer from Ridley Island
Vegetation resources	Kaien Landscape Unit as identified by Schedule 1 of the Central and North Coast Order of the BC Ministry of Forests, Lands, and Natural Resource Operations Land Use Objectives Plan
Wildlife and wildlife habitat	Areas covered by the provincial North Coast Land and Resource Management Plan (LRMP) with a focus on Ridley Island and the marine habitat in the vicinity of Ridley Island
Aquatic environment	Areas of Chatham Sound west to Triple Islands, south to Porcher Island and north to Dundas Island
Human health	Same as air quality LAA (in keeping with largest relevant VEC boundary)
Archaeological and heritage resources	Approximate boundary of the claimed traditional territory of the Tsimshian Nation extending south to Kitasoo, north to the mouth of the Nass River, and up to the Skeena River just east of Terrace
Aboriginal groups' current use	Approximate boundary of the claimed traditional territory of the Tsimshian Nation extending south to Kitasoo, north to the mouth of the Nass River, and up to the Skeena River just east of Terrace
Navigable waters	Areas of Chatham Sound west to Triple Islands and south to Porcher Island

direct and indirect effects of the Project can be reasonably expected to occur. LAA boundaries for each VEC are defined in Table 3-1.

Regional assessment area

The RAA boundary for the VECs consists of the areas within each LAA boundary and also the areas related to other projects whose potential residual effects that could interact with the residual effects from construction, operation or decommissioning of the Project. RAA boundaries for each VEC are defined in Table 3-2. The defined RAA is used when the cumulative impacts evaluation for an individual effects assessment determines that a cumulative impacts assessment is warranted.

3.4 Purpose of and Need for the Project

Canpotex is proposing to construct the Canpotex Potash Export Terminal to facilitate export of potash from Saskatchewan to global markets via ocean-going vessel in response to increased world-wide demand. PRPA is proposing to construct a road, rail and utility corridor to support works for the marine terminal and other future development on Ridley Island.

4. Project Alternatives

Based on paragraph 16(1)(3) of the Act, the Agency required that the proponent assess alternatives to the project as part of a comprehensive study. Alternatives to the project are functionally different ways to meet the Project's need and purpose. As well, in accordance with paragraph 16(2)(b) of the Act, the comprehensive study included consideration of the alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means. The evaluation of both of these factors is

presented in the following sections, based on evaluations conducted by the proponent.

4.1 Alternatives to the Project

The proponent has indicated that the need for and purpose of the Project is to meet the growing global demand for fertilizer. The Project will accomplish this by providing a means of exporting potash from Canada to overseas markets. Given the location of potash reserves relative to regions requiring potash, the proponent has determined that the only feasible way to transport large volumes of potash to global markets is by rail and ocean going vessel. Consequently, there are no viable alternatives to the Project that are technically or economically feasible.

4.2 Alternative Means of Carrying Out the Project

The proponent reviewed the economically and technically feasible alternative means of carrying out the proposed project. The following factors were considered, along with the general environmental effects associated with such alternative means and the rationale for selecting the preferred alternative. Special consideration was given to the following alternatives:

- alternative project locations
- alternative construction methods specifically in relation to the causeway and trestle
- alternatives to the rail loop and access road design
- alternatives to, and alternative locations for disposal at sea and disposal on land

The proponent's evaluation of the alternative means for carrying out the Project is presented in Table 4-1.

With regards to the alternatives for disposal at sea of dredged sediments, an alternative analysis that considered nine sites was completed. Based on this analysis, three sites were carried forward for further evaluation by the proponent. These sites are referred to as Site A, Site B and the Brown Passage. Site A is indicated as the preferred location by the proponent. DFO's analysis based on its Risk

Table 4-1: Project Alternatives Assessment

Alternatives	Technical Feasibility	Economic Feasibility	Environmental and/or Socio-economic Considerations	Proponent Preferred Option
Alternative Sites				
Prince Rupert, BC	Considered feasible	Closest proximity to Asian markets, therefore, lowest operating costs	Closer proximity to export market would result in reduced transit time therefore reduced emissions, costs and potential for vessel interactions	✓
Vancouver, BC	Considered not feasible. Rail congestion could make expansion difficult.	Considered feasible	n/a	
Cherry Point, WA	Considered not feasible. Rail congestion could make expansion difficult.	Considered feasible	n/a	

Table 4-1: Project Alternatives Assessment (cont'd)

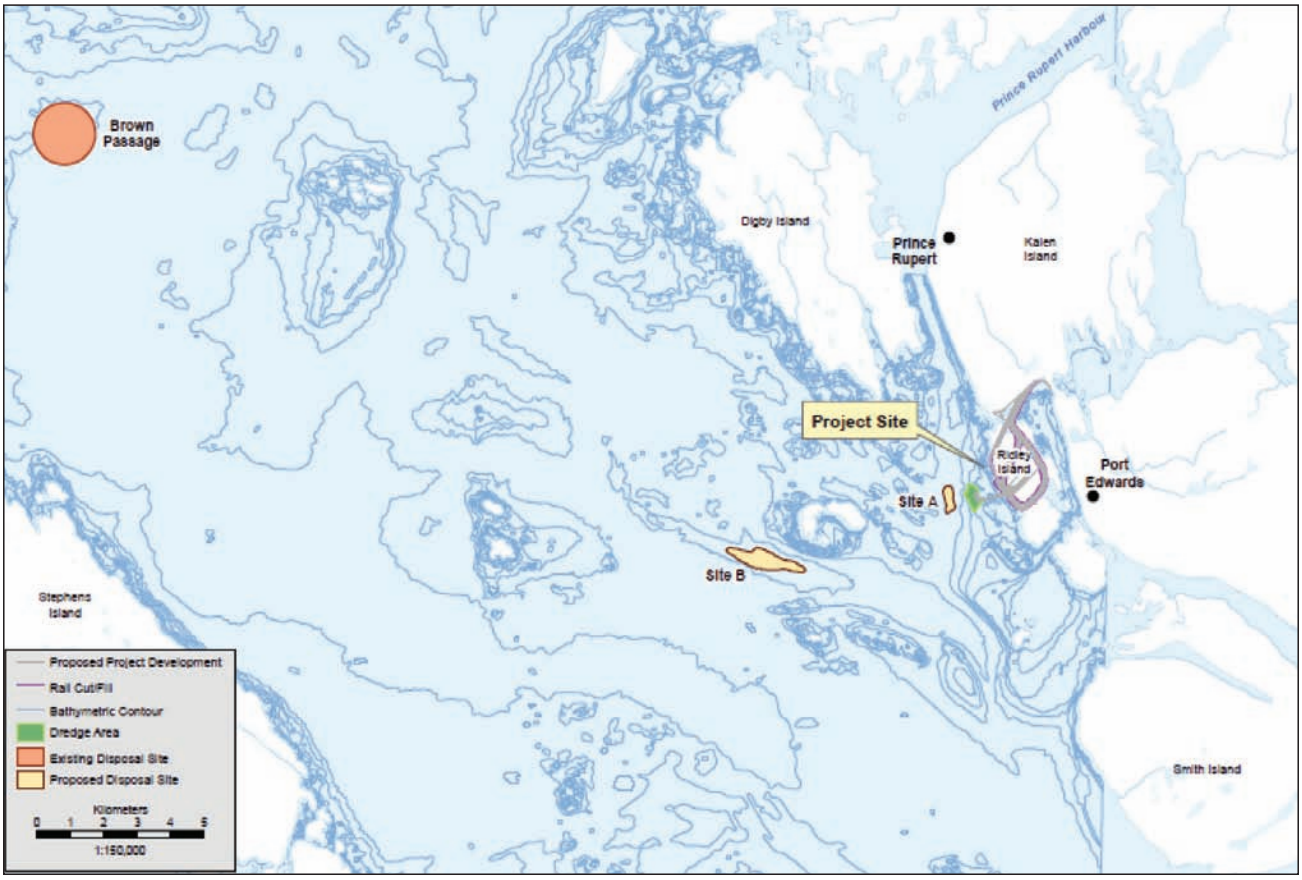
Alternatives	Technical Feasibility	Economic Feasibility	Environmental and/or Socio-economic Considerations	Proponent Preferred Option
Portland, OR	Considered feasible	Considered not feasible. The greater distance to export market would result in greater cost and there would be greater costs associated with accessing inland transportation.	Labour uncertainty due to current economic downturn	
Trestle Support Structures				
Pilings	Feasible	Considered feasible	Some loss of fish habitat	✓
Caissons or cells	Disregarded due to geotechnical issues	Considered feasible	n/a	
Length of Causeway and Trestle				
554 m trestle with a 185 m causeway	Considered feasible	Considered feasible	Impacts on marine habitat would be limited compared to longer causeway option	✓
360 m trestle with a 401 m causeway	Considered feasible	Considered feasible	A 401 m causeway would result in a large amount of habitat loss and may significantly alter water flow and sediment deposition in the area	
760 m trestle	Considered feasible	Considered not feasible due to cost ($8 million)	n/a	
Alternative Disposal at Sea Sites				
Brown Passage	Considered feasible. It is a previously designated disposal site	Disposal cost would be $6-7 million CAD more than alternative options due to distance	The distance from the site would result in greater shipping distance therefore greater costs, emissions, and risk of collision or vessel interference. Aboriginal groups have indicated concerns with this option (though less so than with Sites A and B) due to proximity to traditional fishing area. Use of this disposal area would not likely result in impacts to fish habitat that would require authorization, but may require an authorization for destruction of fish by means other than fishing.	

Table 4-1: Project Alternatives Assessment (cont'd)

Alternatives	Technical Feasibility	Economic Feasibility	Environmental and/or Socio-economic Considerations	Proponent Preferred Option
Site A	Considered feasible	Considered feasible	Reliance on an underwater discharge pipe would result in limited effects on shipping activity, and also reduced emissions and costs. There would be a reduced sediment plume, disposal time, and dispersion. Use of this disposal area would not likely result in impacts to fish habitat that would require authorization, but may require an authorization for destruction of fish by means other than fishing. Aboriginal groups and commercial fishers have indicated significant concerns with this option due to proximity to traditional fishing area.	✓
Site B	Considered feasible	Considered feasible	This option involves greater shipping distance than for Site A but five times less than for Brown Passage; thus, emissions, costs and risk of collision would be reduced. DFO indicates that the use of this disposal area would likely result in impacts to fish habitat that would require authorization and compensation, and would also require an authorization for destruction of fish by means other than fishing. Aboriginal groups and commercial fishers have indicated significant concerns with this option due to proximity to traditional fishing area.	
On-land disposal	Given the amount of material requiring disposal, there are no on-land disposal sites of sufficient size.	Unknown	n/a	

NOTE: n/a = not applicable if alternative is not technically or economically feasible.

Figure 4-1: Disposal at Sea Locations



Management Framework indicates that direct mortality of benthic invertebrates is anticipated at all three sites which would require an authorization under the *Fisheries Act*. A harmful alteration, disruption or destruction (HADD) of fish habitat is anticipated with the use of Site B. If Site B were approved by Environment Canada as an ocean disposal site, an authorization under of the *Fisheries Act* and compensation to offset habitat loss would be required. The locations of the sites are depicted in Figure 4-1.

Although the environmental assessment provides a determination on whether significant adverse environmental effects are likely or not likely for the options presented, the final decision for the disposal site location will be made during the regulatory approval phase pursuant to Part 7, Division 3 of the *Canadian Environmental Protection Act, 1999* which is administered by Environment Canada.

The Agency is satisfied that, according to the results of the evaluation of alternative means, the proponent has identified the technically and economically viable alternative means of carrying out the Project and in identifying preferred alternatives, has considered the environmental effects of the alternatives and their acceptability.

5. Consultation

The federal government agencies have worked cooperatively throughout the consultation process and have collaborated with the proponent on public, project stakeholder, and Aboriginal consultation activities related to

the various environmental assessment and environmental approval processes for the Project.

5.1 Public Consultation Activities

The Act requires that the public be provided with three formal participation opportunities: one at the outset of the process, one during the comprehensive study, and a final opportunity to review and comment on this report.

For this project, the first two formal public consultation periods were held to elicit comments on (1) the project and the conduct of the comprehensive study (August–September 2011), and (2) the summary of environmental effects (December 2011–January 2012).

For the third public consultation opportunity, the Agency will invite the public to provide comments on the content, conclusions, and recommendations of this comprehensive study report. A summary of the comments received will be provided to the Minister of the Environment to inform the environmental assessment decision statement.

Notices of these opportunities for participation were posted on the Canadian Environmental Assessment Registry website. Notices were also provided through local media advertising.

5.2 Aboriginal Consultation Activities

The federal government has a legal duty to consult and, where appropriate, to accommodate, when it has knowledge that its proposed conduct might adversely impact an established or potential Aboriginal or treaty right. Aboriginal consultation is also undertaken more broadly as an important part of good governance and sound policy development and decision making. In addition to the federal government's broader obligations, the Act requires that all federal environmental assessments consider the effect of any project-related change in the environment, and also the effect of that change on current uses of land and resources for traditional purposes by Aboriginal persons. The Act also requires consideration of the effect of any project-related change in the environment on physical and cultural heritage, as well as "any structure, site, or thing that is of historical or archaeological significance," such as sites historically occupied by Aboriginal peoples.

For the purposes of this comprehensive study, the Agency served as Crown consultation coordinator and, together with the federal responsible authorities, conducted consultations in a manner that was integrated with the environmental assessment process to the extent possible.

Aboriginal groups who were contacted and invited to participate in the consultation activities had been identified as potentially having asserted Aboriginal rights that could be adversely impacted by the Project. Five groups were consulted: Metlakatla First Nation (Metlakatla), Lax Kw'alaams First Nation (Lax Kw'alaams), Gitxaala Nation (Gitxaala), Kitselas First Nation (Kitselas), and Kitsumkalum First Nation (Kitsumkalum).

In addition to the three public consultation opportunities noted in Section 5.1, the Agency communicated with Aboriginal groups through phone calls, email, letters, and meetings.

Through the Agency's Participant Funding Program, funds were established to reimburse eligible expenses incurred by Aboriginal groups through their participation in the environmental assessment. All five participating Aboriginal groups were awarded funding through the program.

The proponent also conducted engagement and consultation activities with Aboriginal groups. In determining whether the Project would cause any potentially adverse impacts

on asserted Aboriginal rights and title and also to determine the appropriate mitigation measures, the Agency considered the information collected by the proponent during its consultation activities.

Appendix 5 contains a summary of concerns raised by Aboriginal groups identified during the environmental assessment process.

Potential Adverse Impacts of the Project on Asserted Aboriginal Rights

The Project is located within the asserted traditional territories and/or areas of asserted rights of the Metlakatla, Lax Kw'alaams, Kitselas, Kitsumkalum and Gitxaala. Each of these Aboriginal groups asserts claims of Aboriginal title or rights to Ridley Island and the surrounding area. Potential rights relate to the use for traditional purposes of the land, marine and other resources affected by the Project. Traditional uses include hunting, fishing, gathering activities for subsistence purposes, and use of lands and resources for social and ceremonial activities.

Although many technical and traditional use issues were evaluated and addressed within the environmental assessment, the key potential residual impacts resulting from the project relate to two issues: 1) potential impacts to fisheries resources due to the disposal of dredged material at sea, and 2) potential impact to navigation due to the construction of the trestle from Ridley Island to Coast Island. Other key issues and concerns include marine transportation, whale and vessel interaction, fish habitat compensation planning, wetland compensation, on-site disposal, cumulative effects, development of environmental management plans, and appropriate archaeological monitoring.

The issue of disposal at sea of dredged material was a focus of the environmental assessment. The option of on-land disposal was determined to be unfeasible and ocean disposal locations of dredged material were evaluated in a technical report.[2] This report was shared with Aboriginal groups. From this report, three options were identified and included within the environmental assessment document. These options were evaluated for their likelihood of resulting in significant adverse environmental effects on the valued ecosystem components (VECs) which includes the current use of lands and resources for traditional purposes by Aboriginal persons. The options evaluated were described as Site A, Site B and Brown Passage. Early in the assessment process, Aboriginal groups expressed their concern with the proposed use of Brown Passage. As the environmental assessment process continued and with the completion of an alternatives analysis, greater concern was raised with the use of Site A and Site B, as well as the existing concerns with the use of Brown Passage. However, Brown Passage was the Aboriginal Groups' preferred option. Their concerns centred on potential impacts to fishery resources by disposal at sea of dredged material resulting from potential impacts to water quality, potential impacts to fish habitat, and the cumulative effects of existing and proposed developments within the Prince Rupert harbour area. These issues are discussed further in Section 7.7.

The Project will also result in an impact to navigation for Aboriginal mariners (refer to Section 7.11 Navigable Waters). This project includes the construction of a trestle and conveyor system that will impede a passageway between Coast Island and Ridley Island. Although the Prince Rupert harbour master has indicated that there is no recognized or safe channel through these waters, the channel is used by small vessels because it provides a

[2] Proposed New Disposal at Sea Sites for Canpotex Potash Export Terminal, Ridley Island, Prince Rupert, BC, October 2011, by Stantec Consulting Ltd.

sheltered route from the more open waters on the outside of Coast Island. The channel is too shallow for larger vessels and can only be used by small ones and by those with local knowledge of submerged obstructions within the channel. Despite the construction of the trestle and conveyor system, the passageway is expected to receive continued use by Aboriginal mariners with small vessels. If it is eventually determined that such continued use represents a safety or operational concern to port activities, the Prince Rupert Port Authority may choose to discourage navigation within the immediate vicinity of the project area. In this case, the use of the alternate route around Coast Island would add a distance of about 250 m for each transit.

The Project will be constructed on federal lands managed by the Prince Rupert Port Authority which are not publicly accessible. Although the area is not currently accessible for traditional use activities, the project footprint will remove the potential of the area as a location for any such activities (refer to Section 7.10 Current Use of Lands and Resources for Traditional Purposes by Aboriginal Persons). Vegetative resources such as bark and berries, will be affected and will either be removed or inaccessible in the immediate project area. Marine resources such as fish and shellfish, in the intertidal and sub-tidal environments directly associated with the Project will also be affected or inaccessible. This includes resources affected during dredging and disposal activities. However, the general availability of Aboriginal groups' traditional resources in the areas adjacent to the project footprint is not expected to diminish and alternative locations to carry out traditional activities exist nearby.

It is expected that members of nearby Aboriginal communities can continue their traditional resource use activities. However, the locations of these activities will become restricted to areas outside of the project footprint.

Proposed Accommodation Measures within the Context of the Environmental Assessment

The Agency also considered the consultation measures and engagement activities carried out by the proponent. The proponent held numerous meetings with each of the five Aboriginal groups throughout the environmental assessment process, many of which were also attended by federal authorities. The proponent's efforts for Aboriginal consultation are ongoing and will involve engagement with Aboriginal groups through the development and implementation of environmental management plans, including fish habitat compensation, wetland compensation, and archaeological resource protection.

The participation of Aboriginal groups benefitted the environmental assessment in a number of ways. The original scope of the assessment was set within the limits of the Prince Rupert harbour as defined by the Prince Rupert Port Authority. However, following early input by Aboriginal groups about their concerns with marine shipping and its potential impacts, the scope of the assessment was expanded spatially to include Triple Island. Also, following consideration of input from Aboriginal groups, the scope of the assessment of the increase in rail traffic was also expanded to Lorne Creek. The participation of Aboriginal groups also contributed to the plans for identifying and protecting archaeological resources.

The use of navigation aids, as requested by Transport Canada, will assist Aboriginal mariners with small vessels to continue to use the passage between Coast Island and Ridley Island.

Within the EIS, the proponent also states that "Canpotex and the PRPA are committed to on-going engagement of the affected Aboriginal groups in the Project and the environmental assessment process"…. "An equal level of priority will be dedicated to establishing a relationship with the First Nations communities

where benefits and opportunities for the community can be realized through both business and employment opportunities. Canpotex will work collaboratively with the PRPA and other federal government agencies involved with Crown consultation with First Nations in respect of the impact of the Project on Aboriginal rights, interests and title."

Issues to be Addressed in the Regulatory Approval Phase

The regulatory approval phase of the Project consists of federal authorizations, approvals or permits related to disposal at sea of dredged material, impacts to fish and fish habitat and fish habitat compensation, and navigable waters protection.

The Agency evaluated the proposed sites for disposal at sea of dredged marine sediments in terms of their likelihood to cause significant adverse environmental effects. Based on this evaluation, the Agency has determined the disposal sites presented in the EIS are not likely to result in significant adverse environmental effects, provided the permit application and review process requirements are satisfied pursuant to Part 7, Division 3 of the *Canadian Environmental Protection Act*, 1999. The use of Site B, however, would likely be considered a harmful alteration, disruption or destruction of fish habitat and require a *Fisheries Act* authorization as administered by Fisheries and Oceans Canada.

Any disposal at sea of dredged marine sediments will be in accordance with the requirements of Environment Canada and will be authorized in accordance with the *Canadian Environmental Protection Act, 1999*. Environment Canada will engage further with Aboriginal groups during the detailed design and regulatory phases of the project at which time selection of an appropriate disposal site location will be finalised.

A fish habitat compensation plan is being developed to offset the project's impacts on fish habitat. Should the information on fish habitat impacts change during the Project's detailed design phase, the final plan for fish habitat compensation may be revised. Aboriginal groups will be given an opportunity to review the final fish habitat compensation plan during the regulatory phase of the Project. DFO will also consult further with Aboriginal groups during the detailed design and regulatory phases as required.

Actions taken on behalf of the Prince Rupert Port Authority with respect to the *Canada Marine Act*, such as the establishment of a navigational exclusion zone, will result in an obligation for the PRPA to further consult with potentially affected Aboriginal groups. The establishment of a navigational exclusion zone could potentially result in an impact on asserted Aboriginal rights, specifically those related to the exclusion of access to the designated area. Accordingly, accommodation measures with respect to this potential impact on asserted rights will need to be considered by the PRPA prior to undertaking any such actions.

5.3 Summary of Public Comments

In September 2011, a public comment period was completed on the Project and the conduct of the environmental assessment. Two comments were received from the public during the public participation periods and both were supportive of the project. One made reference to retaining access to a beach on Ridley Island. However, despite the Project, access to this beach is already restricted because the access crosses federal lands managed by PRPA that are not publicly accessible.

A second public comment period was completed during December 2011 to January 2012. This comment period focused on a summary of the EIS

as prepared by the proponent but no comments were received from the public at this time.

Although received outside of the official comment periods for the environmental assessment, comments relating to the project were provided to Fisheries and Oceans Canada in June 2012 on behalf of the United Fishermen and Allied Workers Union, Canadian Auto Workers' union, and the T. Buck Suzuki Environmental Foundation. The comments related to concerns with the effects of dredging and disposal at sea of dredged materials on fisheries resources and fish habitat and the impacts to navigation between the passageway between Ridley and Coast Islands. Of the three options presented for disposal at sea of dredged material, Brown Passage was their preferred option.

6. Existing Environment

The existing environment was studied within the EIS. The result was a detailed evaluation of the geophysical, biophysical, aquatic and human environments.

In regard to the geophysical environment, Ridley Island is a low, flat plain of the Hecate Depression, approximately 0 to 30 metres above sea level. The island consists largely of granite, and off-shore sediments consist of silts, clays and fine sand. The area experiences higher than average seismic activity. Results of soil and sediment analyses confirm copper and arsenic are naturally elevated within the project area. Sediment quality was slightly over guidelines for copper, arsenic, 2-methylnapthalene, and phenanthrene within a settling pond on Ridley Island.

The climate for the project area is temperate with moist winds and the greatest amount of rain fall in Canada. Temperatures range from 7 to 17°C in the summer and 0 to 5°C in the winter.

The air quality is generally good in the project area because the location is far from industrial emitters. The China Paper Group pulp mill, which is now closed, is considered responsible for historically high hydrogen sulphide levels.

In terms of the biophysical environment, the project area lies within the Coastal Western Hemlock biogeoclimatic zone. There are many lowland areas with bogs and wetlands. SARA-listed plant species have been identified at the time of sampling. The assessment area supports moose, deer, marten, squirrels, hares, beavers, wolves, muskrats, weasels, bears, voles and bats. Ridley Island itself has black-tailed deer, porcupine, beaver, muskrats and gray wolves. The Prince Rupert area has 288 bird species recorded including marine birds, songbirds and raptors. Many of these species overwinter and breed in the region. On Ridley Island, the noted species include bald eagle, double-crested cormorant, glaucous-winged gull, pelagic cormorant, ring-necked grebe, western grebe, surf scoter, pigeon guillemot, Barrow's goldeneye, great blue heron, killdeer, bufflehead, mallard duck and Canada goose. Five amphibians and two reptiles occur in the region. The western toad and coastal tailed frog are listed as species of special concern under SARA.

The aquatic environment includes freshwater and marine habitats. The freshwater habitat on Ridley Island is mainly sphagnum bog, and it supports only the three-spined stickleback. The marine habitat is typical of that along the BC coast. There are over 300 species of fish in the area, diverse and productive kelp beds, and the waters have various species of marine mammals. The east side of Ridley Island is protected, and the west side is much more exposed to waves and currents. The area is just north of the Skeena River estuary where several commercially significant species of fish spawn including salmon and eulachon. The marine floor adjacent to the terminal consists of fine-grained sediments, with few rock substrates.

In regard to the human environment, Ridley Island is located in the city limits of Prince Rupert, three km west of the village of Port Edward. There are five Aboriginal groups that have asserted rights and historical presence in the area. As noted in section 5.2, these groups include Lax Kw'alaams, Metlakatla, Gitxaala, Kitselas and Kitsumkalum.

7. Environmental Effects Assessment

7.1 Approach

The Agency, in cooperation with other federal authorities and Aboriginal groups, evaluated the proponents' assessment of the Project's potential adverse environmental effects on the valued ecosystem components (VECs). The analysis of environmental effects was based on information and technical supporting documents prepared and provided by the proponent, comments received during public and Aboriginal consultation processes, and commitments made by the proponent to implement mitigation measures.

Mitigation measures were identified to reduce the overall impact of potential adverse environmental effects. Many of these measures have been integrated into the project design or operational plans. The environmental effects remaining after the implementation of mitigation measures—the residual effects—were evaluated consistent with the Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects (Federal Environmental Assessment Review, 1994). A summary of the evaluation of the significance of environmental effects is included in Appendix 2.

A follow-up framework has been prepared to study areas of the assessment where there may be uncertainty about the magnitude of an environmental effect and the effectiveness of proposed mitigation measures (see Section 8).

A summary of the VECs, environmental effects, proposed mitigation and conclusions regarding the significance of the environmental effects are tabled in Appendix 1.

7.2 Air Quality and Greenhouse Gases

The Project's emissions of criteria air contaminants (CAC) include; sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), inhalable particulate matter (PM_{10}), and fine inhalable particulate matter ($PM_{2.5}$). These emissions have been modeled and the results compared with the relevant Canada and British Columbia ambient air quality objectives. The results indicated that the CAC concentrations for all cases are below the most stringent Canada and British Columbia ambient air quality objectives. None of the relevant regulatory objectives are exceeded at any of the identified sensitive receptor locations.

Project air emissions of greenhouse gases (GHG) were also modeled and compared with the Canada and British Columbia year 2020 projected totals. It is estimated that the Project will contribute 15,654 tonnes of carbon dioxide equivalents per year during construction and 21,144 tonnes of carbon dioxide equivalents per year during operations. GHG emissions from operations will be very small in comparison with the year 2020 projected Canada (about 0.004 percent) and British Columbia (about 0.05 percent) GHG emission totals.

Mitigation

A number of mitigation measures for the protection of air quality have been identified for this project and are described in Appendix 2,

Table 2-1. These mitigation measures will support CAC compliance with the regulatory objectives throughout the project phases.

For mitigation during the construction phase, on and off-road construction equipment will be properly tuned and maintained. Equipment will be powered with low sulphur fuel when available. It is expected that the Ridley Island soil is sufficiently moist so as to naturally suppress excessive dust emissions. If not, dust associated with construction will be minimized with dust suppressants as practicable.

For mitigation during the operations phase, conveyers and transfer points will be enclosed with spill trays to facilitate clean-up. The dust collection system will allow dust to be captured at all transfer points and bagged or returned to the potash handling system. Soft drop unloading systems will be provided in the potash storage building to capture fugitive dust that is generated by stacking and reclaim operations. All dust collectors will be maintained at peak efficiency.

Government, Public and Aboriginal Comments

Health Canada and Environment Canada provided a technical review of information provided by the proponent on air quality contaminants of concern and modeling prepared for the assessment. Environment Canada has recommended that the proponent establish an ambient air quality monitoring network to verify impact predictions and mitigation effectiveness in protecting sensitive receptors.

Agency Conclusions on Significance of the Residual Environmental Effects

Taking into account the implementation of the mitigation proposed, the Agency concludes that the Project is not likely to cause significant adverse environmental effects on air quality.

7.3 Noise and Vibration

The Canpotex facility will be physically separated from the nearest affected residences in Port Edward by distance, the topography of Ridley Island, and the water body separating Ridley Island from the mainland. The Agency evaluated the facility's impact during construction and operations phases based on the sound metrics advocated by Health Canada for use in environmental assessments.

The noise emitted during the construction of the port and the storage facilities will be attenuated by distance and topography. Also, the sound levels can be adequately controlled to limit any impact in Port Edward despite the need for night time construction at the port facility and the storage area. The rail corridor is closer to the village, but construction will be confined to daytime activity.

During operations, the sound produced by activities on Ridley Island and the marine terminal will be adequately attenuated by the distance to Port Edward. The increased rail traffic passing through Port Edward and inland will be closer to the potentially affected residents, but will remain within the noise criterion established by Health Canada. The village of Port Edward is situated on a rail line that is being expanded to accommodate the growth of freight and materials shipment through Ridley Terminals and Fairview Terminal. Although the additional traffic related to the Canpotex facility will gradually increase the noise level, it will remain within the threshold specified by Health Canada.

Mitigation

Additional mitigation measures to reduce noise and vibration include avoiding construction along the east side of Ridley Island during night-time hours and on weekends where practicable. It also includes the application of standard best management practices such as keeping equipment

well-maintained, fitting internal combustion engines with appropriate muffler systems, and the strategic placement of construction equipment such that high noise producing equipment is as far away as possible from nearby residents where practicable. See Appendix 2, Table 2-2 for details.

Government, Public and Aboriginal Comments

Aboriginal groups and Health Canada recommended that vibration be added as a valued ecosystem component. Based on comments from Aboriginal groups, the scope of the noise and vibration assessment was extended to Lorne Creek along the CN Rail line.

Agency Conclusions on Significance of the Residual Environmental Effects

Taking into account the implementation of the mitigation proposed, as well as the monitoring and follow-up program, the Agency concludes that the Project is not likely to cause significant adverse environmental effects as a result of noise and vibrations.

7.4 Ambient Light

The effects of light pollution during the Project's construction and operation phases were assessed by evaluating its visibility to Port Edward residents. Contractors will have limited control over the amount of lighting needed during the construction phase, but the topography of Ridley Island will shield Port Edward from most of the temporary lighting used at that time.

Mitigation

The lighting for the operations phase has been designed to reduce light pollution. The lighting at the terminal will likely not be visible from Port Edward. It has also been designed with full horizontal cutoff fixtures so that skyglow due to the Project will be substantially less than would be the case with older style light fixtures. The retention of the tree cover wherever possible, and particularly on the highest ground of Ridley Island will further reduce the impact of light at Port Edward. See Appendix 2, Table 2-3 for details.

Government, Public and Aboriginal Comments

The Agency considered the results of the ambient light assessment in reaching a determination of the likelihood of significant adverse environmental effects resulting from the Project. No additional comments were received relating to project effects on ambient light.

Agency Conclusions on Significance of the Residual Environmental Effects

With mitigation measures in place, the Agency considers the effects of the Project on ambient light will not likely be significant.

7.5 Vegetation

Rare plant surveys conducted on Ridley Island found two provincially listed rare vascular plants, but these occurred outside the project footprint, and no plants listed as species-at-risk were observed. There will be no direct loss of observed rare plants due to the proposed project.

A total of 69 hectares (ha) of wetland occur in the project footprint and will be lost as a result of the Project. Since the wetlands provide biogeochemical, climate, and habitat functions, a wetland compensation plan will be developed. Following the implementation of the compensation plan, the residual effects of this project on wetland function are expected to be neutral.

A total of 15.6 ha of ecological communities of conservation concern occur in the project footprint

and will be lost. This includes one red-listed wetland community, two blue-listed wetland communities, and two blue-listed upland communities. This loss represents 28 percent of the ecological communities of conservation concern that have been mapped on Ridley Island. The loss of wetland communities of conservation concern will be mitigated by means of the proponents' wetland compensation plan. The loss of the upland communities of conservation concern is expected to be far below the thresholds outlined by the Central and North Coast Order (CNCO) for the Kaien Landscape Unit.

A total of 36 ha of old forest and 47 ha of riparian area will be lost due to the Project. These losses are well within the recommendations by the CNCO for the retention of old forest and riparian areas in the Kaien Landscape Unit.

Plants traditionally used by Aboriginal persons will also be lost due to vegetation clearing for the Project; the particular species are very common on Ridley Island, as well as regionally and provincially.

Mitigation

Mitigation measures will include the development of a wetland compensation plan and includes consideration of rare and traditionally used plants, drainage and erosion control measures. See Appendix 2, Table 2-4 for details.

Government, Public and Aboriginal Comments

Aboriginal groups expressed concern with the loss of the forested area. Comments from Aboriginal groups included the request for consideration of traditionally used plants within any wetland compensation plan. Further development of this plan will provide opportunities for participation from Aboriginal groups and will consider traditionally used plants.

Agency Conclusions on Significance of the Residual Environmental Effects

Based on the findings of this assessment and the proponent's commitment to develop a wetland compensation plan, the Agency considers the potential effects of the Project on vegetation resources will not likely be significant.

7.6 Wildlife and Wildlife Habitat

The Agency considered the effects of the Project on SARA listed species, nesting migratory birds and marine birds. To assess the Project's effects on species-at-risk, the marbled murrelet, northern goshawk and western toad were chosen as indicator species. The project effects on habitat, animal movement patterns, and mortality were also considered.

The most common bird species are Pacific wren, Swainson's thrush, Townsend's warbler, and dark-eyed junco. Less common species include hermit thrush, northern flicker, Stellar's jay, and yellow warbler. The barn swallow, a listed species recorded during breeding bird surveys is listed as threatened by COSEWIC. In addition to migratory bird nests, there are two bald eagle nests on Ridley Island; all of these nests will be avoided during construction activities.

The most abundant species recorded during the marine bird surveys were several unidentified species of gulls, bald eagle, northwestern crow, mew gull, and marbled murrelet. The federally listed species-at-risk observed during marine bird surveys included marbled murrelet and great blue heron.

Habitat alteration for most wildlife species on Ridley Island will displace a very small number of individuals and will not affect

their species population. For the western toad, measures to compensate for this reduction will be applied in the development of a wetland habitat compensation plan.

Mitigation

Mitigation measures include adjusting construction schedules to avoid nesting periods, retaining two bald eagle nests and establishing nest set-backs, and salvage and relocation of western toads. In addition, the wetland compensation program seeks to replace and protect terrestrial and breeding habitat for western toads and will provide habitat for many other species of wildlife. See Appendix 2, Table 2-5 for details.

Government, Public and Aboriginal Comments

The Canadian Wildlife Service (CWS) participated in the conceptual development of the wetland compensation plan which will include elements for terrestrial habitat compensation. Aboriginal groups expressed interest in participating in developing the wetland compensation plan and further development of the plan will include opportunity for their participation.

Agency Conclusions on Significance of the Residual Environmental Effects

Overall, with mitigation measures in place, the risk of mortality for most wildlife is low. Consequently, the risk of mortality of wildlife is considered not significant.

With mitigation measures in place, the Agency considers the effect of the project on wildlife will not likely be significant.

7.7 Aquatic Environment

The waters around the Project area in Prince Rupert are rich in marine resources and support commercial, recreational and Aboriginal food, social and ceremonial fisheries. Key species harvested are: Pacific salmon, halibut, rockfish, ling cod, herring, sole, Dungeness crab, prawns and bivalves.

The aquatic environment assessment focused on the effects of the Project on marine fish and fish habitat. The effects on freshwater fish and fish habitat were not considered because previous studies conducted on Ridley Island indicate there is no habitat suitable to support freshwater fish within the project footprint. Project activities associated with the construction and operation of the marine terminal and the road, rail and utility corridor may result in the following impacts on marine fish and their habitat: loss or alteration of marine fish habitat; direct mortality or physical injury; sensory disturbance (related to underwater noise); and degradation of water and sediment quality. The *Fisheries Act* provides legal protection to fish and their habitats. Impacts to fish and fish habitat may require authorization pursuant to the *Fisheries Act*. In addition, habitat compensation measures may be required to offset loss of the productive capacity of fish habitats."

Project construction activities will result in the loss, alteration, and disruption of marine fish habitat. This includes intertidal substrate loss or alteration from infilling, subtidal substrate loss or alteration, subtidal substrate disruption from dredging, backshore vegetation loss from clearing, and the loss or disruption of small areas of kelp and eelgrass habitat loss from infilling. All species of fish, invertebrates and algae surveyed are common on the north coast of British Columbia and no rare or endangered species were observed at the time of surveying. To ensure that there is no net loss of productive capacity of marine fish habitats, a detailed habitat compensation plan (HCP) is being developed in collaboration with DFO. This plan will include the creation of high-productivity habitats, including a subtidal reef and an eelgrass bed, as well as the restoration of intertidal and subtidal habitats.

Shoreline infilling and dredging activities will result in the direct mortality of some marine invertebrates and destruction of marine plants. Mobile species, such as fish and marine mammals, will likely move from the construction area to avoid the effects of the construction activities. The EIS states that loud in-water construction activities such as blasting and pile driving may cause some fish and marine mammals to temporarily avoid the area affected by noise, however, sound levels will not be of sufficient intensity to cause physical harm. A blasting management plan will be developed to reduce the level of underwater pressure to minimize potential effects on marine organisms. Where practicable, piles will be installed using a vibratory driver, which produces significantly less noise than the conventional impact hammer. If an impact hammer is required, bubble curtains will be employed to provide noise attenuation and reduce sound levels emitted in the marine environment.

For the disposal of dredged material, three disposal sites have been proposed: Site A and Site B (both within PRPA boundaries), and Brown Passage. Site B and Brown Passage would use conventional scow disposal methods. Site A has been identified as the preferred location by the proponent due to its proximity to the project site which enables suction dredge and pipe disposal methods.

DFO analysis based on its risk management framework indicates that direct mortality of benthic invertebrates is anticipated at all three sites resulting in a requirement for an authorization pursuant to the *Fisheries Act*. Impacts to fish habitat would also be likely if Site B is selected as an ocean disposal site, and an authorization pursuant to the *Fisheries Act*, as well as compensation to offset habitat loss, would be required.

Dredging of subtidal sediment and the disposal of this material at sea will result in localized increases in total suspended solid (TSS) levels. TSS monitoring will be conducted throughout the project construction phase to ensure that levels do not exceed the established guidelines.

Through sediment sampling within the dredge area, concentrations of polychlorinated dibenzo-p-dioxins (dioxins) and polychlorinated dibenzofurans (furans) have been identified and found to exceed the Canadian Council of Ministers of the Environment (CCME) Interim Sediment Quality Guidelines but are lower than the CCME probable effects limit. Although these results do not indicate concentrations that represent a likelihood of significant adverse environmental effects, the permitting process administered by Environment Canada will further evaluate sediment quality to ensure the appropriate management of any portion of the material that exceeds the applicable objectives for disposal at sea.

All storm water, wastewater and sewage associated with the terminal will be collected and treated prior to being discharged into the marine environment.

All fresh water used on Ridley Island is obtained from Port Edward. The Project design will include appropriate drainage infrastructure to manage surface water runoff. Potential environmental effects of runoff on receiving waters were considered within the marine environment VEC.

Mitigation

To mitigate the effects to the aquatic environment, the proponent has designed the proposed marine terminal to minimize the project footprint in marine habitat. Where habitat loss cannot be avoided, it will be compensated by the rehabilitation of existing marine fish habitats or the creation of new habitats. A detailed habitat compensation plan will be developed in consultation with DFO and implemented at the project site. Where possible, habitats will be replaced like for like: for example, the loss of an eelgrass bed will be compensated for by the creation or rehabilitation of another eelgrass bed. The

habitat compensation plan will be designed to achieve DFO's guiding principle of "no net loss" of productive fish habitat.

The proponent will also apply other mitigation measures. These include avoiding blasting during sensitive periods on key aquatic receptors, surface and waste water management, monitoring for marine mammal presence, potentially using "bubble curtains" and a vibratory pile driver during pile driving, use of a fish salvage program as needed, and adhering to guidelines for underwater blasting. If practicable, silt curtains will be used to maximize containment of silt to the work site and to exclude surface migrating fish from the work site. Ocean disposal activities will be completed during the least sensitive periods for marine mammals and fish including SARA listed humpback whales and harbour porpoises. Also, if marine mammals are present at the site, work practices will also be modified. See Appendix 2, Table 2-6 for additional details.

Government, Public and Aboriginal Comments

Aboriginal groups expressed significant concerns with the activity of disposing dredged material at sea. They had particular concern with the use of sites A and B because these sites are close to fishing grounds used by both Aboriginal groups and members of the United Fishermen and Allied Workers Union. Aboriginal groups expressed interest in the consideration of sites beyond those included within the EIS. Aboriginal groups suggested that the evaluation for the likelihood of significant adverse environmental effects required additional study to reach a conclusion.

An interest was also expressed in participating in the development of a fish habitat compensation plan and compensation options were developed in communication with Aboriginal groups. Aboriginal groups will continue to have an opportunity to participate in the development of the fish habitat compensation plan.

Fisheries and Oceans Canada and Environment Canada provided expertise on the aquatic environment according to their departmental mandates.

Additional comments are included in Appendix 1.

Agency Conclusions on Significance of the Residual Environmental Effects

Marine fish habitats affected by the Project represent a small fraction of the available habitat in the Prince Rupert region. The creation of compensation habitats will ensure that the productive capacity of the marine environment is not diminished. Throughout all phases of the Project, best management practices will be employed to reduce or eliminate adverse effects on marine fish and fish habitat. With the proposed mitigation and requirements related to the necessary federal permits, authorizations or approvals, the Agency concludes that the residual effects of the Project on the aquatic environment will not likely be significant.

7.8 Human Health

The human health assessment evaluated the potential effects of the Project on human health. These include project-related air and noise emissions, ambient light, changes in local water and sediment quality, and human exposure to potash. The dredging and construction of marine facilities can potentially mobilize contaminants into the water and sediments, and these may be transferred up the food chain. Emissions from trains and vessels may adversely affect ambient air quality. Also, changes in ambient light and noise associated with project activities may disturb local people.

No adverse effects on human health are anticipated from fish consumption. The suspension of sediments as a result of dredging will be short-term and localized, and so no accumulation of metals and polycyclic aromatic hydrocarbons (PAHs) in fish is anticipated.

The predicted maximum ground-level concentrations of criteria air contaminants (SO_2, NO_2, CO, PM_{10}, and $PM_{2.5}$) are below regulatory air quality objectives; therefore, air emissions are not expected to pose a risk to people near the site.

During the construction phase of the project, there will be an increased skyglow due to the use of mobile equipment at night, but otherwise this lighting will not be visible to local residents. Implementation of mitigation measures will reduce the potential increases in ambient light. Modeling of the predicted light levels during the operation phase indicates that the project-related lighting will not affect most local residents. Modeling of the predicted noise indicates levels that do not exceed Health Canada guidelines, and, therefore, noise-related effects on human health are not anticipated.

Potash (potassium salt) is nontoxic at concentrations that would be encountered near the site, and it does not pose a risk to local residents. On-site dust control measures and personal protective equipment will minimize the exposure of workers and prevent potential health effects such as eye or skin irritation.

Mitigation

Potential human health impacts to air quality will be avoided because mitigation measures such as on-site dust control will be implemented. Shielding light fixtures and site layout considerations will also reduce annoyance related to unwanted light sources. Personal protective equipment will minimize the exposure of workers, preventing potential health effects such as eye or skin irritation. See Appendix 2, Table 2-7 for additional details.

Government, Public and Aboriginal Comments

One comment was received from the public related to the value of the beaches at Ridley Island. Access to the beach, however, is on federal lands managed by the Prince Rupert Port Authority that are not publicly accessible.

Health Canada provided comment on the environmental assessment relating to the impacts of the project on human health, for issues within its areas of expertise.

Agency Conclusions on Significance of the Residual Environmental Effects

The human health assessment concluded that the use of appropriate mitigation practices during construction and operations will ensure that regulatory objectives are met and that the quality of life and the health of local residents will be protected. Accordingly, the Agency considers project-related effects on human health to not likely be significant.

7.9 Archaeological and Heritage Resources

Seventeen heritage sites, including 18 culturally modified tree (CMT) sites, are recorded on Ridley Island. However, a 2011 archaeological impact assessment conducted on the Canpotex terminal footprint, including offshore components on and east of Coast Island, did not identify any intertidal, terrestrial, or CMT sites within the terminal footprint. Therefore, the potential for encountering archaeological sites is low. Previous studies on Ridley Island concluded that portions of seven CMT sites are located within the road, rail, and utility corridor and could be affected by the Project.

Mitigation

In the unlikely event that any unrecorded terrestrial or intertidal sites are encountered during the Project's development, every effort will be made to avoid them. Where avoidance is not possible, the impacts on these sites will be mitigated through a program of detailed data collection, including systematic data recovery. Where development activities cannot avoid the CMTs, the effects will be mitigated through a systematic recording and dating program of the sites, and the trees will then be salvaged and given to the Aboriginal groups. In addition, the proponent will prepare a "chance find protocol". This will be enable identification of any archaeological or heritage sites should any be discovered during construction. See Appendix 2, Table 2-8 for details.

Government, Public and Aboriginal Comments

Aboriginal groups requested the inclusion of a "chance find protocol" to ensure an established method of response in case unexpected archeological deposits are found. This plan will be implemented for the Project's construction phase. Aboriginal groups also expressed concern at the potential loss of culturally modified trees at the site.

Agency Conclusions on Significance of the Residual Environmental Effects

Although there is a potential for a small number of culturally modified trees to be removed, the use of a systematic management plan for recording, dating and salvaging will ensure that relevant information is retained and provided to Aboriginal groups. The use of a "chance find protocol" will also ensure any previously unknown terrestrial and intertidal archeological resources, if encountered, will be appropriately identified and managed. Accordingly, the Agency considers the effects on archaeological and heritage resources will not likely be significant.

7.10 Current Use of Lands and Resources for Traditional Purposes by Aboriginal Persons

The Project will occur on Prince Rupert Port Authority (PRPA) land within the claimed or asserted traditional territories of five Aboriginal groups: Metlakatla, Lax Kw'alaams, Gitxaala, Kitselas, and Kitsumkalum.

Although the project footprint is already inaccessible because it is on federal lands managed by the PRPA, the potential use of this site for harvesting vegetative and marine resources will be affected. Vegetative resources (e.g., bark, berries) will either be removed or inaccessible in the immediate Project area. Marine resources (e.g., fish, shellfish) in the intertidal and sub-tidal environments directly associated with the Project will also be affected or inaccessible. This includes resources affected during dredging and disposal activities. Since areas of marine fish habitat that are adversely affected by the project will be replaced through fish habitat compensation and since terrestrial resources are already inaccessible for harvesting purposes due to existing access restrictions by the Prince Rupert Port Authority, the Project itself will not likely represent an impact on the harvesting of marine and terrestrial resources.

Government, Public and Aboriginal Comments

Aboriginal groups submitted comments throughout the environmental assessment process on issues pertaining to the Project's impacts on the current uses of lands and resources for traditional purposes. These comments included the incremental loss of land areas for traditional practices and the effects of the increased rail and vessel activity on hunting and general mobility.

Aboriginal groups expressed significant concern with the potential effects of dredging and disposal

at sea activities and the resulting interference with the harvesting of aquatic resources. This issue is discussed in Section 5.2, Aboriginal Consultation and Section 7.7, Aquatic Environment.

Aboriginal groups expressed concern with the proposed obstruction of a shallow navigational passage between Ridley Island and Coast Island. This issue is discussed in the navigation assessment Section 5.2, Aboriginal Consultation Activities and Section 7.11, Navigable Waters.

Agency Conclusions on Significance of the Residual Environmental Effects

The residual effects of the Project on the traditional use of lands for traditional purposes by Aboriginal persons are likely to be limited in magnitude and geographic extent. Taking into account the implementation of the mitigation proposed, the Agency concludes that the Project is not likely to cause significant adverse environmental effects on the current use of lands and resources for traditional purposes by Aboriginal persons.

7.11 Navigable Waters

The navigable waters assessment focused on the Project's ability to comply with the *Navigable Waters Protection Act* (NWPA), which protects the public's right to navigate, and regulates the construction of works that may infringe on this right. Also considered were the effects of the Project on all navigable waters between the project site and the pilot station at Triple Islands.

The construction of the trestle and conveyer system will obstruct navigation for vessels passing between Ridley Island and Coast Island. Due to shallow conditions within this passage, only small vessels are presently capable of utilizing this passage. Vessels that have a shallow enough draft may continue to pass within the piers of the trestle and conveyer system. However, larger vessels will be required to detour around the causeway and Coast Island. The detour will result in about 250 meters of additional travel distance per transit, as well as increase exposure to less sheltered waters on the outside of Coast Island.

Mitigation

Transport Canada will require the use of navigational aids to assist smaller vessels, including those more vulnerable to the less sheltered conditions on the outside of Coast Island so that the passageway between Ridley Island and Coast Island can still be used. However, this continued use by small vessels may eventually be eliminated in the event that the Prince Rupert Port Authority designates the area as a navigational exclusion zone pursuant to the *Canada Marine Act*.

To mitigate the effects on project-related vessels, multiple navigation systems and controls will be put in place to guide their movement during construction and operation of the terminal.

Mitigation measures also include a marine communication plan, protection zones during construction, and posting a notice for updating navigational charts showing the new jetty location. See Appendix 2, Table 2-9 for additional details.

Navigational user surveys were also undertaken by the proponent to identify potentially affected Aboriginal and non-Aboriginal users. The results of these surveys will be used by Transport Canada in developing further mitigation measures to limit potential impacts to navigation.

Government, Public and Aboriginal Comments

As a result of comments from Aboriginal groups on navigational concerns, the scope of the assessment area was increased from the

Prince Rupert Port Authority boundary to Triple Islands. Aboriginal groups and a local fishers group also expressed concern with the obstruction of the channel used for navigation between Ridley Island and Coast Island. The concerns regarding navigation raised by Aboriginal groups are discussed in Section 5.2, Aboriginal Consultation Activities. In addition, Aboriginal groups raised concern about the cumulative increase in vessel traffic due to the expansion of activities at the port of Prince Rupert.

Agency Conclusions on Significance of the Residual Environmental Effects

Based on the assessment and identified mitigation measures, the Agency concludes the potential effects on vessel traffic will not likely be significant.

7.12 Effects of the Environment on the Project

The types of environmental factors that could potentially affect the Project include slope instability, extreme weather, seismic activity and tsunamis, and climate change and sea level rise. There are no hills within the property that could lead to a landslide. Due to the exposure of Ridley Island to wave action from Chatham Sound there is the possibility that extreme weather resulting in high winds and waves, dense sea foam and poor visibility could result in the temporary closure of the terminal. However, the potential for extreme weather to affect operations is considered low due to the low probability of an extreme weather event and the design criteria followed during project development.

The Project is located in an area of high seismic activity. An earthquake of significant magnitude could lead to permanent lateral ground movement and alter the berth and trestle foundation; this could cause settlement and damage to the structure. To minimize the potential for these effects, the structure is designed to accommodate the seismic movement in a one in 475 year seismic event. The Project is designed to withstand significant waves in 50 year return periods. As a result of these project design measures, which reflect parameters identified by the Geological Survey of Canada and the National Building Code of Canada (2005), seismic activity is not expected to have a significant impact on the Project.

Increasing concentrations of greenhouse gases in the atmosphere are believed to be causing global climate change. Increased temperature may contribute to a sea level rise. The Project has been designed to meet extreme weather criteria identified in the National Building Code of Canada (2005). In addition, a conservative sea level rise of one metre has been incorporated into the design.

Government, Public and Aboriginal Comments

Aboriginal groups commented on the effects of tidal erosion on the site's shoreline. The proponent has included consideration of shoreline protection in the project design.

Agency Conclusions on Significance of the Residual Environmental Effects

Having assessed the proposed mitigation strategies, the Project's design criteria and the environmental management plan, the Agency concludes that significant adverse effects of the environment on the Project are not likely.

7.13 Effects of Accidents and Malfunctions

The following potential accidents and malfunctions were considered in the EIS:

- train derailment along the Skeena River (upstream of the eulachon spawning reach)
- fuel spill at the terminal refuelling station

- potash spill to the marine environment
- marine vessel collision with another vessel or grounding
- marine vessel collision with a marine mammal
- train collision with an ungulate

A train derailment along the Skeena River could potentially result in the release of toxic and non-toxic substances into the river. Such a spill could affect aquatic resources, Aboriginal groups' current traditional use, and human health. Depending on the timing and location of the release, juvenile salmon, eulachon, and fish habitat could be affected. However, given the mitigation in place, including emergency response plans, the effects of a spill would likely be localized. Nevertheless it may result in temporary disturbance to some freshwater species and habitat during clean up. Such a disturbance is expected to be short term, localized and reversible. Therefore, the potential residual effects associated with a train derailment are expected to be not significant. A fuel spill at the terminal would not likely pose a major risk to the environment; it would occur in an already disturbed area where there are no watercourses, and all on-site drainage would be collected in an on-site retention pond. As a result, an on-site spill is expected to affect surface soil only.

The release of potash into the marine environment as a result of equipment malfunction or operator error could cause a localized increase in salinity in the marine environment, which could affect marine species that are intolerant to salinity changes. Marine waters surrounding the terminal exhibit dynamic fluctuations in salinity (due to seasonal inputs of freshwater from the Skeena River), and any localized increases in salinity would dissipate rapidly. Species living in environments with dynamic fluctuations in salinity have adapted to those conditions and are generally tolerant of changes. If a spill accumulated on intertidal habitat it could result in death of organisms that have a low salt tolerance. However, because potash is non-toxic, only those organisms directly exposed to it would be affected. The accidental input of potash to the marine environment may have temporary, localized effects on marine biota. However, as potash dissolves rapidly in water and is non-toxic, such effects are expected to be minimal.

Collisions and groundings of marine vessels could puncture a vessel's fuel tank. In a worst case scenario, this could result in the release of 4,000 cubic metres of heavy fuel oil. Given recent records, the likelihood of such an incident is considered very low. For the period 1998 to 2008, there were six reported incidents involving marine vessels in the Prince Rupert area. Of the six reported incidents, three involved bulk cargo vessels. In two cases, the vessel sustained considerable to extensive damage as a result of grounding, but fuel tanks were not punctured in either case. The last recorded incident involving a bulk carrier in the Prince Rupert area occurred in 2001, again with no fuel loss. Considering the number of vessels that call on the Port of Prince Rupert every year (increasing from 215 to 380 between 2006 and 2010), the incidence of vessel collisions and groundings is extremely low.

Vessel strikes with marine mammals can injure or cause the death of whales. Within the assessment area, bulk carrier vessels may encounter several species of large baleen whales, including humpback whales. Although the probability that a bulk carrier vessel will strike a humpback whale is extremely low, bulk carriers calling on Canpotex terminal will observe a maximum speed limit of 14 knots while transiting between Triple Island and the terminal site which will reduce the likelihood of a collision with a humpback whale.

Train collisions with an ungulate, such as a moose, could lead to injury and death. Such incidences are known to occur along the rail

line between Ridley Island and Lorne Creek. Studies are underway to identify ways to reduce the likelihood of a strike, including the use of fencing, whistle calls, and brush and snow management. Considering the number of trains associated with the Canpotex project, no significant effect on the ungulate population is expected. In terms of the cumulative effect of collisions as a result of all projects in the area, there is a concern for the local ungulate population, but not the regional population, which is relatively strong based on resource management harvest (hunting) rates.

Mitigation

Vessel and train movement will occur in compliance with existing codes, procedures and regulations including local pilotage procedures.

Government, Public and Aboriginal Comments

Aboriginal groups provided comments on ungulate strikes due to the increased rail traffic. They also raised potential issues of marine mammal strikes and potential spills of railcars into the Skeena River. Of particular concern were the potential effects of a potash spill on eulachon spawning in the Skeena River. Each of these issues was included in the assessment.

Environment Canada provided comments relating to emergency response planning, the fate and effects of spills, and hazardous materials management (Appendix 3, Commitment 1).

Agency Conclusions on Significance of the Residual Environmental Effects

Taking into account the implementation of the proposed mitigation measures, the Agency considers that the Project is not likely to cause significant adverse environmental effects through accidents and malfunctions.

7.14 Capacity and Sustainability of Renewable Resources

The Act under section 16(2) (d) states that comprehensive study reports must "address the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and the future." The effects of the Project on renewable resources were assessed in detail in the EIS. The assessment focused on vegetation (Section 10), wildlife (Section 11), and aquatic resources (Section 12), which are renewable resources and VECs on Ridley Island and in Prince Rupert harbour. An adverse effect on these resources could reduce the area's capacity to support sustainable forestry, fishing, hunting, and trapping.

The assessment of effects on each of these resources was conducted according to the Scope of Assessment for the Project as well as environmental assessment methods that have been developed to satisfy the regulatory requirements of both CEAA and the Canada Port Authority Environmental Assessment Regulations (CPAEAR). The measures for significance were determined for each VEC and were generally determined by a regulatory standard or a threshold, where available, and based on community and Aboriginal groups' values or management objectives.

After consideration of the Project's design and project-specific mitigation and compensation measures, the Agency determined that none of these thresholds or standards were exceeded and that the Project will not result in significant adverse residual effects for each of the renewable resource VECs.

As the Project is not predicted to have any significant adverse residual effects on renewable resources, the Agency concludes that the Project's impacts on the capacity of the renewable resources will not be significant.

7.15 Cumulative Effects Assessment

Cumulative environmental effects (CEA) are defined as the effects of a project that are likely to result when a residual effect acts in combination with the effects of other projects or activities that have been or will be carried out.

Approach

The CEA was guided by the Canadian Environmental Assessment Agency's Operational Policy Statement (Agency, 2007) and the Cumulative Effects Assessment Practitioners Guide (Agency, 1999). The CEA is based on the following five-step framework:

1. **Scoping.** The cumulative effects assessment was scoped to focus on the identified valued ecosystem components (VECs) and residual environmental effects of the Project when considered in association with environmental issues of regional concern, and the effects of past, present, and reasonably foreseeable actions or projects that have been or will be carried out in the region. The proposed project's CEA is focused on the analysis of effects related to current and future projects and activities that include the most likely future development scenario for the study area. Emphasis is given to cumulative environmental effects arising from projects or activities that are certain and/or reasonably foreseeable, with hypothetical projects considered at a conceptual level.
2. **Analysis of Effects.** The potential environmental effects of each past and presently occurring activity or project and the likely effects of future actions or projects that overlap spatially and/or temporally with project-specific residual effects were identified and considered in terms of the low, medium, and high criteria identified in the environmental effects analysis.
3. **Identification of Mitigation.** Specific mitigation measures to prevent, avoid, reduce, or otherwise control any potential adverse cumulative environmental effects were identified by the proponent. The effectiveness of proposed mitigation was considered along with how existing effects are being or could be managed through other means (i.e., ongoing and future environmental initiatives of other levels of government, cooperative resource management agreements, work of conservation authorities, information from other project proponents, any available environmental assessment reports, and regional stakeholders).
4. **Evaluation of Significance.** The significance of residual cumulative effects was determined using the following criteria:
   a. whether the potential cumulative environmental effects are adverse
   b. whether identified adverse cumulative environmental effects would be considered significant
   c. whether the significant adverse cumulative effects are likely to occur
5. **Conduct of Follow-up.** This step involves the implementation of any required follow-up to the cumulative effects assessment.

7.15.1 Summary of Cumulative Environmental Effects

An analysis of the cumulative environmental effects of the Project, in combination with the residual environmental effects from past, current, and reasonably foreseeable projects, was completed to determine if there is a risk of cumulative environmental effects. The cumulative effects assessment was conducted in two stages. The initial stage consisted of answering the following three questions for each of the VECs:

1. Is the Project predicted to have demonstrable residual environmental effects?

2. Are these effects likely to act in a cumulative fashion with the residual environmental effects of past, current, and reasonably foreseeable projects?
3. Is there a reasonable expectation that the combined cumulative effects (from question 1 and 2) will result in significant adverse environmental effects?

Each of the selected VECs for this project was considered during the assessment:

- air quality
- noise and vibration
- ambient light
- vegetation resources
- wildlife and wildlife habitat
- aquatic environment
- human health
- archaeological and heritage resources
- navigable waters

Numerous past, current, and future projects in the vicinity of the Port of Prince Rupert were included in the cumulative effects assessment. Key projects and their residual effects are summarized in Table 7-15 and Appendix 1.

Government, Public and Aboriginal Comments

Aboriginal groups provided comments on the cumulative impacts from the increased number of ships calling on the Port of Prince Rupert, ocean disposal activities from future projects and increased rail traffic. Environment Canada provided comments relating to potential for cumulative air quality impacts and the need for air quality monitoring. These issues were

Table 7-15 Residual Cumulative Effects from Past, Present and Likely Future Projects

Project	Residual Environmental Effects
Marine terminals and facilities including: Atlin Terminal, Northland Terminal, Lightering Dock, Ocean Dock, Westview Dock, and Fairview Terminal (Phase I and II)	• Air emissions due to shipping traffic and equipment use for loading and unloading vessels • Approximately 13 km of shoreline development including jetties and bank armouring (along Kaien Island and in Porpoise Harbour) • Infill of an estimated 24 ha of marine habitat • 380 vessels per year in 2010 and upwards of 967 by 2017 • Loss of wetland function • Loss of wildlife habitat
Prince Rupert Airport	• Air emissions from aircraft and vehicle traffic • Loss of approximately 13 ha of terrestrial habitat on Digby Island • Loss of wetland function • Potential impacts associated with disposal at sea of dredged material
City of Prince Rupert	• Non point-source air emissions from motor vehicle traffic and heating homes and businesses • Loss of approximately 900 ha of terrestrial habitat on Kaien Isand from municipal developments (including land portions of marine terminals) • Sewage and storm water discharges to Prince Rupert harbour
District of Port Edward	• Non point-source air emissions from motor vehicle traffic and heating homes and businesses • Loss of approximately 46 ha of terrestrial habitat from municipal developments on mainland
CN Rail Line	• Approximately 40 ha of terrestrial habitat loss and an estimated 2 ha of marine infill associated with 25 km of rail in the Prince Rupert and Port Edward area • Up to 14 trains (inbound and outbound) per day currently and 34 train per day in the future • Air emissions due to locomotive operation

Table 7-15 Residual Cumulative Effects from Past, Present and Likely Future Projects (cont'd)

Project	Residual Environmental Effects
China Paper Group Pulp Mill (not operational)	• Loss of approximately 48 ha of terrestrial habitat on Watson Island • Infill of an estimated 6 ha of marine and estuarine habitat for "land-bridge" to mainland and pipeline causeways
Ridley Island Developments including: Prince Rupert Grain, Ridley Terminals (existing and proposed expansion), Houston Pellet, the former Ridley Island log sort, and future developments	• Air emissions due to shipping traffic and equipment use for loading and unloading vessels • Loss of approximately 48 ha of terrestrial habitat on Ridley Island • Infill of an estimated 35 ha of marine intertidal habitat for "land-bridge" to Kaien Island and overburden disposal • Anticipated loss of approximately 175 ha of terrestrial habitat to future developments • Potential contamination from historical activities
Combined Residual Environmental Effects in the Prince Rupert Area	• Air emissions • 13 km of shoreline development • Sewerage and storm water discharges • 1,270 ha of terrestrial habitat loss • 67 ha of marine infill

considered in the evaluation of environmental effects of the Project.

Agency Conclusions on Significance of the Residual Environmental Effects

Taking into account the implementation of the proposed mitigation, the Agency concludes that significant adverse cumulative environmental effects related to the Project are unlikely to occur.

8. Monitoring and Follow-up under the Canadian Environmental Assessment Act

The purpose of a follow-up program is to (a) verify the accuracy of the environmental assessment of a project, and (b) determine the effectiveness of any measures taken to mitigate the adverse environmental effects of the project. Where appropriate, the results of a follow-up program may also support the implementation of adaptive management measures to address previously unanticipated adverse environmental effects and environmental management systems to manage the environmental effects of projects.

The proponent has proposed certain monitoring and follow-up programs to verify the accuracy of their predictions of the Project's environmental effects or the effectiveness of mitigation measures. In addition to several VEC-specific monitoring programs, a qualified environmental monitor will be responsible for overseeing construction activities and ensuring compliance with environmental requirements. Habitat compensation monitoring will also be conducted to monitor the effectiveness of compensation projects in the marine and freshwater environments. The proponent will undertake adaptive management practices with respect to adverse environmental effects that are identified through monitoring. Monitoring and follow-up activities are outlined in Appendix 4.

9. Benefits to Canadians

With the assistance of responsible authorities and federal authorities, the Agency has

rigorously evaluated and assessed the proposed project with respect to its potential effects on valued ecosystem components and other criteria of concern to Canadians. As a result of this environmental assessment process, the Project has been designed to ensure that adverse effects of the Project on the environment will be reduced or eliminated and, where necessary, that mitigation, monitoring, and follow-up programs are in place. Management of environmental issues through the project design and the environmental assessment process brings a net benefit to Canadians.

At key points in the process, the public was invited to participate in the review of the proposed project. Members of Aboriginal groups also reviewed the assessments made by the proponent and the government. As a result of these consultations, and to accommodate the issues and concerns that were raised, the proponent modified the project design, where feasible: for example, by evaluating alternate sites for disposal at sea.

Field studies were carried out to determine the physical, biological, and human characteristics of the environment that would potentially be affected by the Project. The data collected have increased local knowledge concerning archaeological and heritage resources on and around Ridley Island, wildlife and vegetation communities, the aquatic environment, and air and noise quality. This data not only provides residents with greater insight into Prince Rupert's biological and physical environment but also can be used in future assessments in the area, potentially enhancing any future sustainable development opportunities. The environmental assessment process also identified opportunities to compensate for the loss of fish habitat and wetlands.

The assessment process has also provided insight into the capacity for greater economic development in the Prince Rupert area. Subsequently, the new industrial and transportation infrastructure will bring direct and indirect benefits—such as labour opportunities and development expenditures—not only for Prince Rupert but also for the supply chain for Canadian potash globally.

10. Conclusion of the Agency

The Agency has taken into account the following factors in reaching a conclusion on whether the Project is likely to cause significant adverse environmental effects:

- documentation submitted by the proponent
- information, analysis, and conclusions in this comprehensive study report
- views expressed by the public, government agencies, and Aboriginal groups
- the proponent's obligations and mitigation measures, as documented in Appendix 3, Table of Commitments
- requirements to be described in the *Fisheries Act* authorizations and their associated habitat compensation plans to mitigate potentially negative impacts to fish and fish habitat
- requirements to be described in the *Navigable Waters Protection Act* approval,
- requirements to be described in the disposal at sea permit that may be issued under the *Canadian Environmental Protection Act, 1999*
- requirements of the follow-up program to be implemented by the proponent

In the event that the responsible authorities take the course of action described in paragraph 37(1)(a) of the Act, they will ensure that mitigation measures are implemented in accordance with subsection 37(2.1) and (2.2) of the Act.

No significant adverse biological, health, or heritage effects are predicted to result from the

Project. Residual effects are predicted to range in duration from short-term to long-term, and be of low magnitude, localized in geographic extent, and reversible at the terminal site following decommissioning.

The environmental effects of the Project have been determined using assessment methods and analytical tools that reflect current best practices of environmental and socio-economic practitioners. It is the conclusion of the EIS that the Project can be constructed, operated and decommissioned without significant adverse environmental effects, including the consideration of cumulative effects and accidents and malfunctions.

Taking into account the implementation of the mitigation proposed, including commitments made by the proponent in this report and the fulfillment of regulatory requirements, the Agency concludes that the Project is not likely to cause significant adverse environmental effects.

Appendix 1: EIS Summary Table

VEC	Potential Effects	Potential Residual Effects	
Air quality	Change in CAC emissions	Construction: none Operations: none	
	Change in GHG	The Project construction and operations activities will result in the emissions of GHGs, thereby contributing incrementally to national and provincial GHG emission totals (21,144 tpyCO2e during operations	
Noise and vibration	Change in noise level	Construction: in Port Edward sound pressure levels are unlikely to cause more than a brief annoyance during moments of particularly intensive activities. Operations: Closest residents will occasionally perceive the operational sounds, and will hear the train passages	
	Change in vibration	None	
Ambient light	Change in ambient light quality	Some light from the Project will be observable from Port Edward	
Vegetation resources	Loss of rare vascular plants	None	
	Loss of ecological communities of conservation concern	None for wetland communities of conservation concern 1.8 ha of blue-listed upland communities	
	Loss of old forest	Old forest within the project footprint will be lost	
	Loss of wetland function	None	
	Loss of riparian areas	47 ha of riparian habitat will be lost	
	Loss of traditional use plants	Some traditional use plants will be lost	

	Potential Cumulative Effects	Aboriginal and Public Comments and Responses	Proposed Commitments/Mitigation
	Modelling results indicate that the addition of publicly disclosed projects in the assessment area do not have a substantial effects on maximum predicted concentration of CACs.	**Comment 1:** Scope of assessment should be expanded to Lorne Creek **Response 1:** Scope is increased to Lorne Creek	• Use grid-based power rather than generator set for equipment wherever feasible • Use clean fuels in heavy duty diesel vehicles and/or equipment where practical • Sweep paved routes adjoining unpaved traffic areas • Make visual inspections to address potential dust emissions • Use suppressants to reduce dust • Implement air quality and dust control plan • Maintain construction equipment
	Effects of GHGs cannot be attributed to any specific project, and as such, the significance of their cumulative effect was not assessed.	None	
	Modelling results indicate that the addition of future projects in the assessment will not result in exceedances in Health Canada criteria for noise. Therefore cumulative effects of the Project on noise are expected to be not significant.	**Comment 2:** Vibration should be included as a VEC **Response 2:** Vibration is included as part of the noise and vibration section **Comment 3:** Scope should extend out to Lorne Creek. **Response 3:** Scope is extended	• Carry out blasting in accordance with blast management plan • Position stationary noise emission sources as far as practicable from sensitive receptors • Maintain log of noise complaints and address if related to the Project • Develop communication plan to advise residents of noise-causing construction • Avoid construction during the night and weekend where practicable
	None		
	The addition of light effects from publicly disclosed sites in the assessment area will not result in significant cumulative effects.	None	• Leave vegetation buffers where practical
	Given the less than 5% of the RAA is developed or is slated for development by publicly disclosed projects there is no reasonable expectation that the Project's contribution to cumulative effects will compromise the sustainability of the affected resources regionally.	**Comment 4:** Cumulative effects should include land Use plan **Response 4:** A land use plan is included in vegetation and wildlife cumulative effects assessment	• Implement weed management plan • Reduce risk of invasive species by inspecting all construction equipment arriving on the project site • Implement wetland compensation plan

VEC	Potential Effects	Potential Residual Effects	
Wildlife and wildlife habitat	Change in habitat availability	36.3 ha of moderately suitable habitat for marbled murrelets and northern goshawks will be lost 119.9 ha of highly suitable terrestrial habitat and 4.15 ha of highly suitable breeding habitat for western toads will be lost though some will be compensated through the wetland compensation plan	
	Risk of mortality	None	
	Alteration of movement	Some minor disturbance to marine birds as a result of vessel activity	
Aquatic environment	Habitat loss or alteration	None	
	Direct mortality or physical injury	Construction: sedentary invertebrate with high reproductive rates are expected to be affected by the Project	
	Sensory disturbance	Construction: some short term sensory disturbance and localized displacement for fish and marine mammals	
	Degradation of water and sediment quality	Construction: localized increases in TSS Relocation of dredged sediment from marine terminal site to disposal site	
Human health	Changes in country foods to affect human health	None	
	Changes in air emissions to affect human health	Negligible increase in particulate matter	
	Changes in ambient light to affect human health	Low level increases in light levels in Port Edward	
	Changes in noise to affect human health	Brief annoyance during moments of particularly intensive activity	

	Potential Cumulative Effects	Aboriginal and Public Comments and Responses	Proposed Commitments/Mitigation
	There is no reasonable expectation that the Project's contribution to cumulative impacts will affect the sustainability of wildlife resources in the Prince Rupert Region because (1) most wildlife population in the region are secure; (2) alteration of movement to wildlife will be low in magnitude; (3) Project related effects to the risk of mortality will be minor as they will be mitigated using proven measures; (4) the total are of habitat affected by the Project will primarily affect wildlife species with secure populations; and, (5) habitat loss of western toads will be mitigated through wetland compensation.	Comment 5: Cumulative effects should include land use plan **Response 5:** A land use plan is included in vegetation and wildlife in cumulative effects assessment	• Complete clearing activities outside of nesting season where possible • Carry out advance nest survey to ensure no nests are present if clearing during nesting season • Avoid construction within 50 m of eagles nests where practical • During construction, salvage and relocate toads during migration as required • Prohibit feeding and harassment of wildlife • Drivers must follow posted speed limits
	Given the limited amount of regional development (67 ha) and the abundance of undisturbed marine fish habitat, cumulative effects of past, present and future projects on the marine environment are not expected to impact any population of fish, invertebrate or marine mammal at the regional level.	**Comment 6:** Transportation of dredged materials and the effect of disposal should be assessed at Site A, Site B and Brown Passage **Response 6**: Disposal at sea, including transportation activities, is assessed as part of the Project within the EIS **Comment 7:** The aquatic cumulative effects section should include land use plan **Response 7:** A land use plan was not included as part of aquatic assessment because it is not known whether future development will use the aquatic environment **Comment 8:** A disposal at sea site other than Brown Passage should be considered **Response 8:** Two new proposed sites for disposal at sea were assessed as part of the EIS	• Develop habitat compensation plan and post construction monitoring plan • Implement water quality monitoring program
	Consistent with the cumulative effects assessment described in this report for air quality, noise and vibration, ambient light and aquatic environment, no significant effects are expected as a result of past, present and future projects.	**Comment:** There will be loss of access to a small beach located on the south west corner of Ridley Island **Response:** Land access to the beach is lost irrespective of the Project due to Port security requirements. Water access will not be affected	• As identified under sections on air quality, noise and vibration, ambient light and aquatic environment

VEC	Potential Effects	Potential Residual Effects	
Archaeological and heritage resources	Destruction of CMTs	None	
	Disturbance or destruction of terrestrial archaeological or heritage sites	None	
	Disturbance or destruction of intertidal archaeological or heritage sites	None	
Aboriginal groups current uses	Changes to current traditional use patterns	Marine resources (e.g., fish, shellfish) in the intertidal and sub-tidal environments directly associated with the Project will also be affected or inaccessible	
Navigable waters	Physical interference	Loss of access to shallow waters between Coast and Ridley Islands Increased lighting from trestle	
	Change in vessel traffic	Increase in vessel traffic between Triple Islands and Ridley Island	

	Potential Cumulative Effects	Aboriginal and Public Comments and Responses	Proposed Commitments/Mitigation
	Though other projects have affected this resource in the past, the lack of residual effects associated with the proposed project means there is no potential for cumulative effects.	None	• Develop archaeological resource monitoring plan • Protect CMTs where feasible, otherwise systematic recording
	Based on available information, no significant residual effect on Aboriginal groups' current use is expected.	None	None
	Given the negligible overlap between the Project and other facilities generating vessel traffic within the RAA and the separation distance between the Project and other local projects the cumulative effects, if any, would not affect the viability of navigation within the RAA.	**Comment 9:** The assessment should include marine vessel operation and navigation out to the pilotage station at Triple Islands **Response 9:** Scope has been increased as requested **Comment 10:** Projects proposing to ship to Kitimat and to use Triple Island pilotage station should be included in the Navigable Waters and Accident and Malfunctions cumulative effects sections **Response 10:** Vessel travelling to Kitimat travel west of Triple Islands and therefore were not included in the assessment **Comment 11:** Aboriginal groups and other potential vessel users should be consulted **Response 11:** Assessment included consultation with vessel users. Requests for TUSs were submitted to Aboriginal groups	• Apply marine communication plan to ensure vessel operators are aware of construction activities in the area • For all shipping in PRPA waters, follow rules of shipping established by the Port under the Canada Marine Act and the Canada Shipping Act

Appendix 2: Significance of Effects Analysis

Table 2-1: Summary of Project Residual Environmental Effects on Air Quality (key at end of appendix)

Effect #1: Change in Criteria Air Contaminants Emissions					
Activity	Proposed Mitigation Measures (see Notes below)	Residual Environmental Effects Characteristics			
		Direction	Magnitude	Geographic Extent	
Construction and commissioning	• Equipment maintenance • Low sulphur fuel • Dust suppressants • Scheduling • Minimize disturbance • Cover trucks • Site paving	A	L	S	
Operations—Project Site		A	M/L	L	
Operations—Rail Traffic		A	L	L	
Decommissioning		A	L	S	
Residual environmental effects for all Phases		A	L	L	

NOTES:

1. **Equipment maintenance:** Follow equipment maintenance schedules.
2. **Low sulphur fuel:** Use low sulphur fuel for construction equipment.
3. **Dust suppressants:** Application of dust suppressants such as water to minimize the amount of fugitive dust.
4. **Scheduling:** Minimize activities that generate large quantities of dust during high winds.
5. **Minimize disturbance:** Minimize the area of activity.
6. **Cover trucks:** Cover truckloads of materials which could generate dust, as necessary.
7. **Site paving:** Paving of the site as soon as practicable.

Table 2-2: Summary of Project Residual Environmental Effects on Noise and Vibration

Potential Residual Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects Characteristics			
		Adverse or Positive Effect	Magnitude	Geographic Extent	
Effect #1: Noise Effects					
Construction and Commissioning	• Avoid night-time and weekend construction activities along the east side of Ridley Island where possible • Use welded track if practical • Maintain mufflers on internal combustion engines • Near sensitive receptors, reduce number of construction equipment in operation simultaneously • Proper maintenance of conveyors	A	M	L	
Operation		A	L	L	
Decommissioning		A	M	L	
Residual environmental effects for all Phases		A	L	L	

	Residual Environmental Effects Characteristics			Significance*	Prediction Confidence	Likelihood	Recommended Follow-up and Monitoring
	Duration/ Frequency	Reversibility	Ecological Context				
	ST/S	R	D	N	H	M	None
	MT/R	R	D				
	MT/R	R	D				
	ST/S	R	D				
	MT/S	R	D				

* Significance determination

- Not Significant—ambient concentrations of air contaminants are likely to be below relevant regulatory criteria for ambient air quality (i.e., always to be of low to moderate magnitude throughout the LAA).
- Significant—Residual effects ambient concentrations of air contaminants are likely to exceed relevant regulatory criteria for ambient air quality (i.e., to be high in magnitude) and are of concern relative to the geographical extent of predicted exceedances and/or their frequency of occurrence.

	Residual Environmental Effects Characteristics			Significance*	Prediction Confidence	Likelihood	Recommended Follow-up and Monitoring
	Duration/ Frequency	Reversibility	Environmental Context				
	ST/S	R	U	N	H	H	Complaint driven resolution plan.
	LT/R	R	U				
	ST/S	R	U				
	LT/R	R	U				

Table 2-2: Summary of Project Residual Environmental Effects on Noise and Vibration (cont'd)

Potential Residual Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects Characteristics			
		Adverse or Positive Effect	Magnitude	Geographic Extent	
Effect #2: Vibration Effects					
Construction and Commissioning	• Vibration effects at nearby receptors have not been predicted, however the mitigation measures identified for noise will also reduce vibration effects.	A	L	S	
Operation		A	L	S	
Decommissioning		A	L	S	
Residual environmental effects for all Phases		A	L	S	

* Significance determination:

For the purposes of this assessment, based on Health Canada's draft guidance document on noise assessments for CEAA Projects, a residual effect from noise is considered significant if it meets any of the following four conditions:

1. There is an increase in the percent highly annoyed by greater than 6.5% after mitigation has been applied.
2. The LDN value for construction noise with mitigation exceeds 62 dBA.

Table 2-3: Summary of Project Residual Environmental Effects on Ambient Light

Potential Residual Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects Characteristics			
		Adverse or Positive Effect	Magnitude	Geographic Extent	
Effect #1: Change in Ambient Light Quality					
Construction and Commissioning	• Use of "dark sky" shielded luminaires for outdoor lighting • Retain tree line directed to Port Edward where possible • Control outdoor light levels • Centralized lighting control systems	A	L	L	
Operations		A	L	L	
Decommissioning		A	L	L	
Residual environmental effects for all Phases		A	L	L	

* Significance determination:

For the purpose of this assessment, a significant adverse environmental effect on ambient light is defined as an increase in project-related light emissions such that the guidelines for light trespass and glare are exceeded, and where the project-related sky glow would be typical of an urban environment.

	Residual Environmental Effects Characteristics						
	Duration/ Frequency	Reversibility	Environmental Context	Significance*	Prediction Confidence	Likelihood	Recommended Follow-up and Monitoring
	ST/S	R	U	N	H	H	
	LT/S	R	U				
	ST/S	R	U				
	LT/S	R	U				

3. For schools and pre-schools, sound levels exceed an indoor class time average of 40 dBA after mitigation has been applied.
4. For hospitals and seniors residences, sound levels exceed an indoor Leq of 30 dBA, after mitigation has been applied.

A significant adverse effect due to vibration would be associated with intermittent levels that are high in magnitude, or persistent vibrations with medium-term duration that occur at sensitive receptor buildings.

	Residual Environmental Effects Characteristics						
	Duration/ Frequency	Reversibility	Ecological Context	Significance*	Prediction Confidence	Likelihood	Recommended Follow-up and Monitoring
	ST/O	R	U	N	H	H	Use of a qualified Environmental Monitor to oversee general construction and any other activities that could be disruptive concerning light. Follow-up monitoring during all phases of the Project will be on a complaint-driven basis so that specific light trespass issues can be addresed.
	LT/C	R	U				
	ST/O	R	U				
	LT/C	R	U				

Table 2-4: Summary of Project Residual Effects on Vegetation Resources

Potential Residual Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects Characteristics			
		Adverse or Positive Effect	Magnitude	Geographic Extent	
Rare plants	• Wetland compensation planning	N	–	–	
Ecological Communities of Conservation Concern		A	M	S	
Old forest		A	L	S	
Wetland function		N	–	–	
Riparian		A	L	S	
Traditional use plants		A	L	S	
Combined		**A**	**L**	**S**	

*Significance determination:

With the exception of wetlands, there is an absence of federally set standards or thresholds for determining the significance of effects on vegetation resources. As such, recommendations from relevant policy, guidance documents and literature are used to determine the potential of a project to compromise the sustainability of vegetation resources, and thus the significance of effects on vegetation resources. For wetlands, the Federal Policy on Wetland Conservation is followed. Standards for determining significance of each KI are described below.

For rare plants, the Alberta Native Plant Council (ANPC 2006) recommends the removal of no more than one in 50 rare plants to maintain the biological integrity of a population. Therefore residual effects on rare plants are considered significant if they result in the loss of 2% of individuals within a population of Red-listed plants in the regional assessment area (RAA; as defined in Section 3.2.2). For Blue-listed plants residual effects are significant if more than 10% of the individuals within a population are removed.

For ecological communities of conservation concern, the Central and North Coast Order (CNCO) (Ministry of Agriculture and Lands 2009) contains objectives for retention of Red- and Blue-listed plant communities on provincial Crown land. It outlines that rare plant communities must be protected during primary forest activities, but if there are no practical alternatives for infrastructure or road access then up to 5% of a Red-listed or 30% of a Blue-listed community may be disturbed. Therefore, residual effects to ecological communities of conservation concern are considered significant if they lead to the loss of more than 5% of a Red-listed community or 30% of a Blue-listed community in the regional assessment area (RAA; as defined in Section 3.2.2). Note that the CNCO defines Blue- and Red-listed plant communities on its Schedules 5 and 6, whereas the definition used in this assessment is based on the most current listings provided by the BC Conservation Data Centre.

	Residual Environmental Effects Characteristics					
	Frequency	Duration	Reversibility	Ecological Context	Significance*	Recommended Follow-up and Monitoring
	–	–	–	U	N	
	O	L	I	U	N	Wetland compensation plan
	O	L	R	U	N	
	–	–	–	U	N	Wetland compensation plan
	O	L	I	U	N	
	O	L	R	D	N	Incorporate traditional use plants into wetland compensation plan where feasible
	O	**L**	**I**	**U**	**N**	

The CNCO outlines objectives for retention of old forest on provincial Crown land in the Kaien landscape unit, in which the Project occurs (Ministry of Agriculture and Lands 2009). The CNCO recommends retention targets for modal, rare, and very rare units as well as an overall retention target. In the CWHvh2, it recommends the retention of between 59% and 63% of "medium" spruce site series surrogates and "good" western redcedar and spruce leading site series surrogates. It also recommends that 30% of old forest in the Kaien landscape unit be retained. Therefore, residual effects to old forest are considered significant if they: 1) result in the loss of more than 40% of these specifically identified modal, rare or very rare units, and 2) overall, result in the loss of more than 70% of the old forest in the RAA.

The Federal Policy on Wetland Conservation (Government of Canada 1991) has the goal of no net loss of wetland functions on all federal lands and waters. The LAA is entirely federal Crown land, so effects to wetlands are considered significant if they lead to the net loss of any wetland function.

The CNCO outlines retention guidelines for riparian forests, providing requirements that primary forest activities must maintain 70% of functional riparian forest adjacent to S1 to S3 streams; lakes, fens and marshes greater than 1.0 ha; and forested swamps greater than 0.25 ha (Ministry of Agriculture and Lands 2009). Following guidance from the CNCO, residual effects to riparian areas are considered significant if they result in the loss of more than 30% of riparian areas in the RAA.

Residual effects to traditional use plants are considered significant if they eliminate the ability of First Nations to access traditional use species regionally.

Table 2-5: Summary of Project Residual Environmental Effects on Wildlife and Wildlife Habitat

Potential Residual Environmental Effects	Proposed Mitigation Measures	Residual Environmental Effects Characteristics			
		Adverse or Positive Effect	Magnitude	Geographic Extent	
Effect #1: Change in Habitat Availability					
Construction and Commissioning	• Limit and mark Project footprint clearing limits • Establish wetland compensation program to replace and protect habitat for use by western toads	A	L	L	
Operations		A	L	L	
Decommissioning		No effects anticipated; positive if any			
Residual environmental effects for all Phases		A	L	L	
Effect #2: Risk of Mortality					
Construction and Commissioning	• Clear vegetation outside of the nesting season for birds (April 1 to July 31) • Establish a 50 m no-development and no-disturbance setback around the two trees with Bald Eagle nests • Prohibit feeding and harassment of wildlife. • Establish a wildlife encounter management plan to report Project related wildlife deaths and nuisance animals to Canpotex, and the appropriate provincial wildlife authority • Salvage and relocate western toads prior to vegetation clearing and grubbing • Salvage and relocate western toads to prevent road and rail mortality for activities occurring during breeding season • Place exclusion fencing around western toad breeding ponds	A	L	S	
Operations		A	L	S	
Decommissioning		No effects anticipated			
Residual environmental effects for all Phases		A	L	S	
Effect #3: Alteration of Movement					
Construction and Commissioning	• Establish a 50 m no-development and no-disturbance setback around the two trees with Bald Eagle nest • Prohibit feeding and harassment of wildlife	A	L	L	
Operation		A	L	L	
Decommissioning		No effects anticipated			
Residual environmental effects for all Phasest		A	L	L	

*For this assessment an effect is considered significant when there is a moderate to high probability that the Project may affect the long-term viability of a local population (and not significant when this is not the case). Determining significance is most straightforward when there are clear thresholds in terms of the long-term viability of wildlife populations. Unfortunately, for most effects on wildlife, clear thresholds are not available. The assessment therefore is largely based on broadly applied thresholds used in conservation. Several international initiatives have applied a one percent population threshold to designate sites of conservation significance. To designate a Canadian Important Bird Area (Smart and Wilcox 2001), a Western Hemisphere Shorebird Reserve Network site (http://www.whsrn.org/network/sites.html), or a Ramsar Wetland of International Importance (http://www.ramsar.org/key_criteria.htm) the site must support at least 1% of the individuals of the population of interest—national, regional, or global.

	Residual Environmental Effects Characteristics						
	Duration/ Frequency	Reversibility	Environmental Context	Significance*	Prediction	Likelihood	Recommended Follow-up and Monitoring
	P/O	R	D	N	M	H	Monitor use of wetland compensation area by western toads.
	P/C	R	D				
	P/O	R	D				
	ST/O	R	D	N	M	M	The need for salvage and relocation will be reassessed following construction.
	LT/R	R	D				
	LT/R	R	D				
	MT/C	R	D	N	H	L	None necessary.
	MT/C	R	D				
	C	R	D				

- Changes in habitat availability will be significant if Project activities result in the loss of suitable habitat, such that at least 1% of individuals in the population of a selected indicator species are negatively affected.
- Risk of mortality will be considered significant if it affects at least one percent of individuals in the population of selected indicator species.
- Alteration of movement will be considered significant if it eliminates usage of the waters surrounding Ridley Island by sensitive marine birds (i.e., marbled murrelet).

Table 2-6: Summary of Project Residual Environmental Effects on the Aquatic Environment

Potential Residual Environmental Effects	Proposed Mitigation/ Compensation Measures	Residual Environmental Effects Characteristics			
		Direction	Magnitude	Geographic Extent	
Habitat Loss or Alteration					
Construction and Commissioning	• Habitat compensation for lost/ disturbed fish habitats • Best management practices	A	M	S	
Operation		No effects anticipated			
Residual environmental effects for all Phases		A	M	S	
Direct Mortality or Physical Injury					
Construction and Commissioning	• Seasonal Avoidance • Marine Mammal Monitoring Program • Bubble curtains • Fish Salvage Program • Blasting Guidelines • Best management practices	A	M	L	
Operation		No effects anticipated			
Residual environmental effects for all Phases		A	M	L	
Sensory Disturbance					
Construction and Commissioning	• Seasonal Avoidance • Use of vibratory pile driver wherever feasible • Bubble curtains • Best management practices	A	L	R	
Operation		A	L	R	
Residual environmental effects for all Phases		A	L	R	
Degradation of Water and Sediment Quality					
Construction and Commissioning	• Erosion Control Waste water treatment • Best management practices	A	L	L	
Operation		A	L	R	
Decommissioning		No effects anticipated			
Combined Environmental Effect		A	L	L	
Combined Residual Environmental Effects					
Construction and Commissioning		A	M	L	
Operation		A	L	R	
Combined Environmental Effect		A	M	L	

* For the Aquatic Environment, an effect is considered 'significant' if it has a moderate to high probability of affecting the long-term productive capacity of fish habitat in the Prince Rupert area or the viability of a local population.

	Residual Environmental Effects Characteristics						Recommended Follow-up and Monitoring
	Duration and Frequency	Reversibility	Ecological Context	Significance*	Prediction Confidence	Likelihood	
	MT/O	R	U	N	H	H	Monitoring of construction activities that could impact the aquatic environment Habitat compensation
	MT/O	R	U				
	MT/S	R	U	N	M	M	Monitoring of construction activities that could impact the aquatic environment Marine mammal monitoring during blasting
	MT/S	R	U				
	ST/S	R	U	N	M	M	Monitoring of construction activities that could impact the aquatic environment
	LT/R	R	U				
	LT/R	R	U				
	ST/S	R	U	N	H	L	Monitoring of construction activities that could impact the aquatic environment Ongoing site water quality monitoring Wastewater monitoring
	LT/R	R	U				
	ST/S	R	U				
	MT/S	R	U	N	H	L	All follow-up and monitoring listed above
	LT/R	R	U				
	MT/S	R	U				

Table 2-7: Summary of Project Residual Environmental Effects on Human Health

Potential Residual Environmental Effects	Proposed Mitigation/ Compensation Measures	Residual Environmental Effects Characteristics			
		Direction	Magnitude	Geographic Extent	
Potential for Changes in Country Foods to Affect Human Health					
Construction and Commissioning	• Waste water treatment • Best management practices	N	–	–	
Operations		No effects anticipated			
Decommissioning		No effects anticipated			
Residual environmental effects for all Phases		N	–	–	
Potential for Changes in Air Emissions to Affect Human Health					
Construction and Commissioning	• Equipment maintenance • Low sulphur fuel • Dust suppressants • Scheduling • Minimize disturbance • Cover trucks • Site paving if necessary	A	L	L	
Operations		A	L	L	
Decommissioning		No effects anticipated			
Residual environmental effects for all Phases		A	L	L	
Potential for Changes in Ambient Light to Affect Human Health					
Construction and Commissioning	• Use of “dark sky” shielded luminaires for outdoor lighting • Retain tree line directed to Port Edward where practicable • Control outdoor light levels • Centralized lighting control systems	A	L	L	
Operations		A	L	L	
Decommissioning		No effects anticipated			
Residual environmental effects for all Phases		A	L	L	
Potential for Changes in Noise Levels to Affect Human Health					
Construction and Commissioning	• Avoid night-time construction activities on the east side of the island • Internal combustion engines • Near sensitive receptors the number of construction equipment in operation simultaneously will be reduced • Proper maintenance of conveyors	A	M	L	
Operations		A	L	L	
Decommissioning		A	M	L	
Residual environmental effects for all Phases		A	L	L	

* For Human Health, an effect was only deemed significant where a complete exposure pathway between contaminant(s) and humans exists, and where exposure concentrations are likely to result in Human Health effects. If stressor levels (i.e., chemicals, light levels, or noise) were greater than applicable health-based regulatory standards, and a pathway of exposure was identified, stressors were then carried forward for assessment of their potential to cause health effects. If stressor levels were lower than the regulatory objectives, then these factors were expected to have negligible effects to the public.

	Residual Environmental Effects Characteristics						Recommended Follow-up and Monitoring
	Duration and Frequency	Reversibility	Ecological Context	Significance*	Prediction Confidence	Likelihood	
	–	–	–	N	M	H	Use of a qualified Environmental Monitor to oversee general construction and any other activities that could be disruptive to the Aquatic Environment
	–	–	–				
	ST/S	R	D	N	M	H	During Operations: Particulate matter monitoring at Project site
	LT/C	R	D				
	LT/C	R	D				
	ST/S	R	D	N	M	H	Use of a qualified Environmental Monitor to oversee general construction and any other activities that could be disruptive concerning light
	ST/S	R	D				
	ST/S	R	D				
	ST/S	R	D	N	M	H	Complaint driven resolution plan
	LT/R	R	U				
	ST/S	R	U				
	LT/R	R	U				

Table 2-8: Assessment of Effects on Archaeological and Heritage Resources

Potential Residual Environmental Effects	Proposed Mitigation/ Compensation Measures	Residual Environmental Effects Characteristics			
		Direction	Magnitude	Geographic Extent	
Effect 1: Destruction of CMTs					
Construction and Commissioning					
Preparation (Clearing and Grubbing, Site Grading)	• Avoidance of CMTs within or adjacent to the Project footprint where possible • Equipping construction foremen with Chance Find Protocol • Systematic recording, including stem-round collection, of all CMTs identified within the Project footprint	A	L/M	S	
Effect 2: Disturbance or Destruction of Terrestrial Archaeological or Heritage Sites					
Construction and Commissioning					
Temporary Construction Infrastructure (trailers, power, sanitary facilities, etc.)	• Equipping construction foremen with Chance Find Protocol • Systematic recording of identified archaeological and heritage sites • Additional mitigation by systematic data recovery and/ or archaeological monitoring of development where warranted	A	L/H	S	
Site Preparation (Clearing and Grubbing, Site Grading)					
Rail Loop Construction					
Onshore Terminal Construction (receiving, storage, reclaim and shiploading facilities, site services)					
69 kV transmission line Construction					
Installation of Canpotex Rail Tracks					
Access Road/Overpass Construction					
Marine Facilities Construction (causeway, trestle, and berth)					

	Residual Environmental Effects Characteristics						Recommended Follow-up and Monitoring
	Duration and Frequency	Reversibility	Ecological Context	Significance*	Prediction Confidence	Likelihood	
	LT/O	I	D	N	H	L	None required unless undiscovered resources are identified during the construction phase
	LT/O	I	D or U	N	H	L	None required unless undiscovered resources are identified during the construction phase

Table 2-8: Assessment of Effects on Archaeological and Heritage Resources (cont'd)

Potential Residual Environmental Effects	Proposed Mitigation/ Compensation Measures	Residual Environmental Effects Characteristics			
		Direction	Magnitude	Geographic Extent	
Operations					
Arrival and Departure of Vessels	• Systematic recording of identified archaeological and heritage sites • Additional mitigation by systematic data recovery where warranted	A	L/H	S	
Decommissioning					
Removal of Site Infrastructure (potash handling system/ buildings)	• Systematic recording of identified archaeological and heritage sites • Additional mitigation by systematic data recovery and/ or archaeological monitoring of activities where warranted or appropriate	A	L/H	S	
Effect 3: Disturbance or Destruction of Intertidal Archaeological or Heritage Sites					
Construction and Commissioning					
Marine Facilities Construction (causeway, trestle, and berth)	• Equipping construction foremen with Chance Find Protocol • Systematic recording of identified archaeological and heritage sites • Additional mitigation by systematic data recovery and/ or archaeological monitoring of development where warranted	A	L/H	S	

*The significance of all identified archaeological or heritage resources will be assessed using the standards described in British Columbia's *Archaeological Impact Assessment Guidelines* (Archaeology Branch 1998).

	Residual Environmental Effects Characteristics						Recommended Follow-up and Monitoring
	Duration and Frequency	Reversibility	Ecological Context	Significance*	Prediction Confidence	Likelihood	
	LT/O	I	D or U	N	H	L	None required unless undiscovered resources are identified during the operations phase
	LT/O	I	D or U	N	H	L	None required unless undiscovered resources are identified during the construction phase
	LT/O	I	D or U	N	H	L	None required unless undiscovered resources are identified during the construction phase

Table 2-9: Summary of Project Residual Environmental Effects on Navigable Waters

Potential Residual Environmental Effects	Proposed Mitigation/ Compensation Measures	Residual Environmental Effects Characteristics			
		Direction	Magnitude	Geographic Extent	
Effect 1: Physical Interference					
Construction and Commissioning					
Dredging and Disposal of Sediment	• Marine communication plan • Protection zones • Installation of navigational aids on the new structure where required • Updated navigational charts showing the jetty location	A	L	S	
Marine Facilities Construction (causeway, trestle and berth)					
Commissioning					
Effect 2: Change in Vessel Traffic Pattern					
Construction and Commissioning					
Dredging and Disposal of Sediment	• Marine communication plan • Protection zones • Marine Communication Plan; Installation of navigational aids on the new structure where required	A	L	L	
Marine Facilities Construction (causeway, trestle and berth)					
Placement of Trestle					
Operations					
Arrival and Departure of Vessels	• Standard procedures will be followed by vessels entering the port	A	L	R	

*For the purpose of this assessment, an effect is significant if there is a high probability of long-term effects on the navigational use of the LAA for a large proportion of users.

	Residual Environmental Effects Characteristics						Recommended Follow-up and Monitoring
	Duration and Frequency	Reversibility	Ecological Context	Significance*	Prediction Confidence	Likelihood	
	Construction and Commissioning						
	P/S	R	D	N	H	L	None required
	Construction and Commissioning						
	MT/O	R	D	N	H	L	None required
	Operations						
	LT/R	R	D	N	H	L	None required

Table Key

DIRECTION:	**(A)** *Adverse* **(P)** *Positive* **(N)** *Neutral*
MAGNITUDE:	**(L)** *Low*: Minimal or no impairment of VEC **(M)** *Moderate*: Measureable change in VEC **(H)** *High*: Serious impairment to VEC
GEOGRAPHIC EXTENT:	**(S)** *Site-specific*: Environmental effects restricted to the Project site (i.e., Project footprint) **(L)** *Local*: Environmental effects extend beyond the Project footprint but remain localized within the Local Assessment Area **(R)** *Regional*: Environmental effects extend to the watershed/regional level
DURATION:	**(ST)** *Short-term*: Effects are measurable for <2 years **(MT)** *Medium-term*: Effects are measurable for 2 to 20 years **(LT)** *Long-term*: Effects are measurable for >20 years **(P)** *Permanent*: Effects are permanent
FREQUENCY:	**(O)** Occurs *once* **(S)** Occurs *sporadically* at irregular intervals **(R)** Occurs on a *regular* basis and at regular intervals **(C)** *Continuous*
REVERSIBILITY:	**(R)** *Reversible* **(I)** *Irreversible*
PREDICTION CONFIDENCE:	Based on scientific information and statistical analysis, professional judgment and effectiveness of mitigation **(L)** *Low* level of confidence **(M)** *Moderate* level of confidence **(H)** *High* level of confidence
ECOLOGICAL CONTEXT:	**(U)** *Undisturbed*: Area relatively or not adversely affected by human activity **(D)** *Developed*: Area has been substantially previously disturbed by human development or human development is still present **(N/A)** *Not Applicable*
SIGNIFICANCE:	**(N)** *Not Significant* **(S)** *Significant*
LIKELIHOOD:	Based on professional judgment: **(L)** *Low* probability of occurrence **(M)** *Medium* probability of occurrence **(H)** *High* probability of occurrence

Appendix 3: Summary of Commitments

No.	Commitment	Project Phase/ Timing	Party Responsible
1	The proponent must ensure that a construction Environmental Management Plan (EMP) is prepared and adhered to, and it will consist of the following component plans: • Human and Safety Management Plan • Air Quality and Dust Control Plan • Noise, Vibration and Ambient Light Management • Spill Prevention and Emergency Response Plan (including hazardous materials inventory, areas of environmental sensitivity, fate and effects of potash spill into freshwater aquatic environment) must be submitted to Environment Canada for review • Water Management and Sediment/Erosion Control Plan • Fish Habitat Compensation Plan • Wetland Compensation Plan • Archaeological Resources Monitoring Plan • Blast Management Plan • Weed Management Plan • Navigation Management Plan for vessels within Port of Prince Rupert Waters that includes consideration of whale and vessel interaction	Pre-Construction	PRPA Canpotex EC
2	Towards the end of the project life, the proponent must develop and implement as required a decommissioning and abandonment plan in accordance with the regulations in force at that time and in consultation with regulatory agencies to the satisfaction of relevant regulatory agencies.	Pre-Decommissioning	Canpotex EC DFO TC
3	Canpotex and the PRPA must prepare a marine habitat compensation plan to the satisfaction of DFO and finalize options following agency review to fully compensate for predicted residual effects and uncertainty of effects. The Plan must be developed prior to the start of construction. The Habitat Compensation Plan must be based on the following: • Site visit prior to commissioning to quantify and report on the actual footprint loss associated with construction • Like-for-like habitat criteria as per direction from DFO for off-site areas selected for intertidal and subtidal (substrate, eelgrass, and kelp bed) compensation/restoration where possible A monitoring plan to measure and evaluate the effectiveness of the compensation plan. Post-construction verification plan to measure actual marine habitat loss and ensure that appropriate mitigation and compensation has been provided for all affected habitats, including as-built-drawings for all project elements.	Pre-Construction	Canpotex PRPA DFO
4	The proponents will ensure on land blasting is completed in accordance with the blast management plan (see Commitment 1). Blasting warning signals must be used prior to every blast.	Construction	PRPA Canpotex
5	The proponent will ensure that in water blasting is completed in accordance with the blast management plan (see Commitment 1), which must include mitigation measures for blasting in the marine environment (including a 500 m exclusion zone for whales). Blasting warning signals must be used prior to every blast. The blast management plan will be provided to DFO prior to construction.	Construction	Canpotex DFO EC

No.	Commitment	Project Phase/ Timing	Party Responsible
6	The proponent must attempt to complete clearing activities outside of the nesting season for birds (April 1 to July 31), subject to Commitment 9 below.	Construction	PRPA Canpotex
7	If clearing during the nesting season is unavoidable, a nest survey will be conducted in advance of the clearing by a certified professional to ensure compliance with the *Migratory Birds Convention Act*.	Construction	PRPA Canpotex
8	To avoid destruction and reduce the potential abandonment of the two eagle nests the proponent must avoid construction activities, where practicable, within 50 m of active nests.	Construction	PRPA Canpotex
9	During construction western toads will be salvaged and relocated during their migration between terrestrial and breeding habitats. The need to salvage and relocate will be reassessed prior to commissioning.	Construction	PRPA Canpotex EC
10	The proponent must reduce the risk of the introduction of invasive species by inspecting all construction equipment that arrives on the project site. The goal is to ensure they are clean and weed-free and any equipment that is not weed-free must be cleaned before being brought on site.	Construction	PRPA Canpotex
11	The proponent must manage invasive species in accordance with the weed management plan (see Commitment 1).	Construction Operations	PRPA Canpotex
12	The proponent must prohibit feeding and harassment of wildlife by construction and operations personnel.	Construction Operations	PRPA Canpotex
13	Drivers of project vehicles must follow posted speed limits and be trained to use extra caution in areas frequented by wildlife and people.	Construction Operations	PRPA Canpotex
14	The proponent must position stationary noise emission sources (e.g., rock crusher, diesel generators, pumps, compressors) as far as is practical from sensitive receptors.	Construction	PRPA Canpotex
15	The proponent will use grid (rather than generator set) electrical power for equipment wherever feasible.	Construction	PRPA Canpotex
16	The proponent must use clean fuels such as ultra-low-sulphur diesel and bio-diesel (if available) in dump trucks and other heavy-duty diesel vehicles and/or equipment, in conjunction with the use of particulate trap control devices (as well as catalytic converters) to avoid excessive diesel emissions.	Construction	PRPA Canpotex
17	During construction, the Proponent must sweep paved routes adjoining unpaved traffic areas in the construction zone. Visual inspections will be conducted to identify and address potential dust emissions, and to ensure procedures are implemented to document the inspections, respond to complaints, and document the responses and actions taken.	Construction	PRPA Canpotex
18	The Proponent must minimize dust by using suppressants such as water and minimizing the area of activity.	Construction Operations	PRPA Canpotex
19	Canpotex must fulfill the permit application and review process requirements to the satisfaction of Environment Canada and pursuant to the *Canadian Environmental Protection Act* with respect to disposal at sea activities.	Construction	Canpotex EC

No.	Commitment	Project Phase/ Timing	Party Responsible
20	The proponent must develop an archaeological resources monitoring plan describing measures to protect, monitor and, where necessary, assess and, under the direction of a qualified archaeological professional, recover artefacts from archaeological sites that are found in the project area during construction.	Pre-Construction	PRPA Canpotex
21	The proponent will employ best practices during construction to minimize air and sound emissions as specified in the air quality and dust control plan (see Commitment 1). Vehicles and off-road construction equipment must be properly tuned and maintained.	Construction	PRPA Canpotex
22	The proponent must maintain a log of any noise complaints received during project construction and operation, investigate to assess whether they relate to project activities, and if so, identify and implement practical measures that will be taken to address them.	Construction Operations	PRPA Canpotex
23	CMTs will be protected from damage or destruction caused by project activities where feasible. If avoidance of CMTs is not feasible, systematic recording, including stem-round sampling, will be conducted within the project footprint. A detailed final report will be completed to ensure that the collected data and the results of all analytical processes are available to other archaeologists and Aboriginal groups. A copy of the report will also be submitted to the BC Archaeology Branch.	Construction	PRPA Canpotex Archaeology Branch
24	A water quality monitoring program (see Commitment 1) will be implemented to ensure all discharged water into the marine environment meets provincial and federal guidelines.	Operations	Canpotex
25	Nearby residents will be advised of significant noise-causing construction activities and these will be scheduled to create the least disruption to receptors. A communication and complaint documentation and resolution plan will be developed. If noise complaints related to traffic occur, they will be logged and investigated to assess whether they are linked to project activities.	Construction	PRPA Canpotex
26	All construction equipment and vehicles and conveyor components will be properly maintained.	Construction	PRPA Canpotex
27	Construction activities will be avoided during night-time and weekends where practicable.	Construction	PRPA Canpotex
28	Wetland compensation will be addressed through consultation with CWS.	All phases	PRPA Canpotex CWS
29	A marine communication plan will be developed to ensure that other vessels are aware of construction activities in the area and protection zones (no-go areas) will be identified.	Construction	Canpotex PRPA
30	All shipping within the Port of Prince Rupert will be conducted following the rules of shipping established by the Port under the Canada Marine Act and in compliance with the requirements of the Canadian Coast Guard (CCG), and with the Port Authority Operations Regulations.	All phases	Canpotex

No.	Commitment	Project Phase/ Timing	Party Responsible
31	For excavation and relocation of potentially contaminated media from or within the site, the Proponent must: • Implement a sampling program utilizing appropriate sampling methodology (i.e., as per CCME 1993, or BC MOE 2009) to characterize the site, targeting portions of the site potentially impacted by existing/historical activity with a higher sampling density (e.g., 25- to 50 m spacing between sample locations); and • Maintain records of volumes, characteristics, and deposition locations pertaining to upland disposal of potentially contaminated material.	Preconstruction and construction	Canpotex PRPA
32	• Follow-up and monitoring of all VECs will be carried out (see Appendix 4 for details).	All phases	Canpotex PRPA

Appendix 4: Follow-up and Monitoring

No	VEC	Monitoring Commitment	Project Phase	Reporting to:
1	Noise	Should complaints of excessive noise be received during construction or operations, the root cause of these complaints should be determined, and corrective action will be taken as warranted. In the event of complaints, ambient monitoring of noise may be conducted if required to identify the source or extent of such problems.	Construction and operations	HC
2	Ambient light	A qualified environmental monitor will be hired to oversee general construction and any other activities that could be disruptive concerning light. Follow-up monitoring during all phases of the Project will be on a complaint-driven basis so that specific light trespass issues can be addressed.	All phases	HC
3	Vegetation	The wetland compensation plan will include a detailed monitoring plan to confirm the achievement of project goals.	Operations	EC
4	Wildlife and wildlife habitat	A western toad mitigation plan (habitat compensation, salvage and relocation, fencing of ponds), and details of the follow-up program will be developed through communication with Environment Canada.	Construction	EC
5		Marine bird stationary counts with vessel transect surveys to ensure 1 year of data has been collected, details of the follow-up program will be developed through communication with Environment Canada.	Construction	EC
6	Aquatic environment	A trained environmental monitor will be onsite to observe and document all in-water construction activities to ensure that all in-water activities are carried out using best management practices, and that the specified mitigation measures are followed. A post-construction site assessment will also be carried out to verify the areal extent of marine habitats lost or disturbed by the Project. These values will be cross-referenced with the HCP.	Construction	DFO

No	VEC	Monitoring Commitment	Project Phase	Reporting to:
7	Aquatic environment	To compensate for the loss and alteration of marine fish habitats, Canpotex and PRPA will develop an HCP in consultation with DFO. Compensation measures may include the rehabilitation of existing, disturbed marine fish habitats, and the creation of new marine fish habitats. To ensure that compensation measures are successful, a monitoring program will be developed. This program will include construction monitoring and effectiveness monitoring. Effectiveness monitoring will entail three annual surveys of the habitat compensation features to ensure that they are being utilized by the intended marine biota. The specifics of this monitoring program will be provided in the habitat compensation plan.	Construction and operations	DFO
8	Aquatic Environment	Water discharged into the marine environment will be collected bi-annually by a trained environmental monitor and sent for analysis at a certified laboratory. This water will be analyzed for total suspended solids (TSS), turbidity, fecal coliforms, and contaminants (i.e., metals, PCBs, BTEX, and PAHs). This water monitoring program will ensure that all discharged water meets provincial and federal guidelines.	Operations	DFO
9	Human Health	Routine construction monitoring during in-water works will be conducted to ensure there are no impacts to local marine water and sediment quality that could result in chemical effects to biota and to human consumers of potentially affected country foods.	Construction	HC
10	Archaeology	If an archaeological site is identified, archaeological monitoring and/or additional studies will be completed.	Pre-construction	Aboriginal Groups
11	Air Quality	The proponent will request from the British Columbia Ministry of Environment (BCMoE) that an air discharge permit be issued for the Project under the *Environmental Management Act*, prior to Project commissioning. Subject to the air discharge permit, the proponent may be required to establish an ambient air monitoring network for project related emissions. Monitoring results would then be used to verify impact predictions and mitigation effectiveness in protecting sensitive receptors. The monitoring results would also establish a baseline to support the prediction and assessment of cumulative impacts related to this and future project proposals in the area.	All phases	BC MOE EC

Appendix 5: Summary of Concerns Raised by Aboriginal Groups

Comment ID#	Group	Subject	Comment	
1	All groups	Aquatic environment—disposal at sea	Concerned with the potential environmental effects of dredgeate disposal at sea at sites A, B and Brown Passage and would like land disposal options investigated further. If disposal at sea undertaken, Brown Passage is preferred option.	
2	All groups	Aquatic environment—disposal at sea	Concerned that material disposed at sea will disperse unpredictably through disposal activities.	
3	All groups	Aquatic environment—disposal at sea	Concerned that the activity of disposal at sea will impact their rights to fishing both at the location of disposal, and also up the Skeena River.	

	Summary of Proponent Response	Agency Response
	The on-land disposal of 800,000 m^3 of marine sediment has the potential to result in significant environmental impacts due to the introduction of saline materials to the terrestrial environment. Furthermore, it is not considered economically viable. We are unaware of any areas in the vicinity of Prince Rupert that have the capacity to hold this volume of material. The report "Proposed New Disposal at Sea Sites"(Stantec 2011) contains further detail addressing the concerns with disposal at sea. In brief, the recommended disposal sites do not overlap with rockfish habitat or eelgrass beds. The influence of marine water conditions (circulation) was included in disposal at sea modeling. Disposal activities will occur in deep waters and are not expected to affect herring spawning in the intertidal zone. Groundfish, herring, or salmon may be temporarily displaced; however, these species are expected to return following the completion of disposal activities.	Sections 5.2, 7.7 and Appendices 1–4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures related to the aquatic environment. The sites proposed by the proponent for disposal at sea of dredged marine sediments have been evaluated for their likelihood to cause significant adverse environmental effects. Based on this evaluation, the disposal sites presented in the EIS are determined to not likely result in a significant adverse environmental effect. Site B, however, may require habitat compensation. Disposal at sea of dredged marine sediments will be in accordance with the requirements of Environment Canada and will be authorized in accordance with the Canadian Environmental Protection Act (CEPA). Comments and concerns raised by Aboriginal groups related to the environmental effects of disposal at sea have been considered during the environmental assessment. Environment Canada will engage further with Aboriginal groups during the regulatory phases of the project. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	Potential dispersal of disposed materials was carefully considered by modeling total suspended sediment (TSS) levels at Site A (using suction dredging and a pipe network) and Site B (using a barge). Details are provided in the ASL Sediment Modeling report found in Appendix G of the Proposed New Disposal at Sea Sites report. Maximum TSS level at both sites reduce to <1 mg/L within 7–10 hour after the discharge operation ends. Given that TSS is lower when using the suction dredge, use of this method is considered a form of mitigation.	Sections 5.2, 7.7 and Appendices 1–4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures related to the aquatic environment. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	Given the location of proposed disposal sites, disposal at sea activities will not affect fishing rights up the Skeena River. Should fishing activities coincide spatially with disposal activities, timing windows will be discussed through consultation with DFO, and based on feedback received from Aboriginal groups.	Sections 5.2, 7.7 and Appendices 1–4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures relating to the aquatic environment. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.

Comment ID#	Group	Subject	Comment	
4	All groups	Aquatic environment—disposal at sea	Concerned that the plume from disposal at sea will affect the migration of aquatic species, inquired about any studies that evaluate the plume's impact on fisheries.	
5	Lax Kw'alaams, Metlakatla	Aquatic environment—disposal at sea	Requested participation in disposal at sea studies and monitoring.	

	Summary of Proponent Response	Agency Response
	Studies to evaluate the impact from disposal at sea on fisheries have been conducted and results are described below. The disposal sites A and B are located at 63 and 177 m respectively. Habitat at this depth is largely soft sediment and almost completely void of vegetation. There is no structure (i.e., shallow rocky reefs, eelgrass or kelp beds) that would be considered habitat for salmon. Juvenile salmon prefer habitat that is relatively shallow and complex thus providing places for refuge and to forage. As a result, impacts to migrating fish would be minimal. With respect to eulachon, research on habitat use while in the ocean is limited, however, existing research suggests that adults live near the ocean bottom between the 20 and 150 m contour or along the edges of offshore banks (Hay & McCarter 2000). Site A is the only site that falls within this range. However, a review of incidental eulachon catches indicates the adults are most abundant throughout the Hecate Strait as opposed to in near shore waters such as those around Ridley Island. As larvae are pelagic, their distribution will be relatively homogenous throughout the area and not concentrated at any of the proposed disposal site. As a result, available information suggests that none of the identified disposal sites would be considered good adult or larval eulachon habitat. With respect to other species of larvae and plankton, these are also pelagic organisms that are at the whim of the currents and therefore can be found anywhere. To minimize impacts on larval organisms disposal activities will be limited to the fall and winter months where possible.	Sections 5.2, 7.7 and Appendices 1–4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures relating to the aquatic environment. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	The proponent welcomes further engagement and discussion on the subject of Disposal at Sea. However, at this time, no additional disposal at sea studies are planned. Part of the Disposal at Sea permit is the requirement to pay a disposal fee based on the amount of sediment being disposed. This fee is used by EC to monitor the disposal site. As a result, participation in the monitoring program would need to be organized through EC.	Sections 5.2, 7.7 and Appendices 1–4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures relating to the aquatic environment. The sites proposed by the proponent for disposal at sea of dredged marine sediments have been evaluated for their likelihood to cause significant environmental effects. Based on this evaluation, the disposal sites presented in the EIS are determined to not likely result in a significant adverse environmental effect. Site B, however, may require habitat compensation. Disposal at sea of dredged marine sediments will be in accordance with the requirements of Environment Canada and will be authorized in accordance with the *Canadian Environmental Protection Act*. Comments and concerns raised by Aboriginal groups related to the environmental effects of disposal at sea have been considered during the environmental assessment. Environment Canada will engage further with Aboriginal groups during the regulatory phases of the project.

Comment ID#	Group	Subject	Comment	
6	Metlakatla	Aquatic environment—fish habitat	Concerned that cetaceans, specifically humpback whales and porpoises have not been adequately considered.	
7	Lax Kw'alaams, Metlakatla	Aquatic environment — fish habitat compensation	Interested in participating in the development of the compensation plan.	

	Summary of Proponent Response	Agency Response
	The proponent acknowledges that several species of marine mammals are common in the Prince Rupert area. This was noted in Sections 6.2.3.2 and 12.2.2.6 of the EIS. The proponent further acknowledges that the area surrounding Ridley Island is regularly used by both harbour porpoises and humpback whales. As stated in Section 12.2.2.6 of the EIS "Harbour porpoises are seen year-round in the vicinity of Ridley Island, particularly in Porpoise Harbour and between Ridley and Kinahan Islands. Humpback whales are seen seasonally from November to February in the waters to the west of Ridley Island (Davis 2006). During sediment sampling offshore from the proposed terminal location in November 2010, Stantec biologists observed several groups of feeding humpback whales within the port boundaries and within several hundred meters offshore from the proposed terminal. During intertidal surveys, marine mammals were also observed opportunistically in the vicinity of Ridley Island. These observations included harbour porpoises and harbour seals. Detailed species lists can be found in the Aquatic Environment TDR." This information was taken into consideration when evaluating potential project effects. The proponent also acknowledges that the Project may cause temporary displacement of marine mammals. As concluded in Section 12.3.4.1 of the EIS, "...it is expected that marine mammals will exhibit localized avoidance of cargo vessels arriving and departing the marine terminal. However, avoidance is expected to occur only while vessels are in operation. At the expected frequency of one to two Project vessels per week, this represents a short-term effect. The behaviour and distribution of marine mammals is expected to return to normal when vessels are not operating within the Project area."	Sections 5.2, 7.7, 7.13 and Appendices 1–3 outline the potential effects, mitigation measures, environmental effects analysis, and commitments related to the aquatic environment and the effects of accidents and malfunctions, including the potential for marine vessel collisions with marine mammals. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	A draft report discussing opportunities for marine fish habitat compensation was made available to the Working Group on February 7, 2012. The proponent welcomed comments and feedback from Aboriginal groups on this draft report. Aboriginal groups are encouraged to participate in refining and implementing the fish habitat compensation plan, including becoming involved in the long-term habitat effectiveness monitoring program.	Sections 5.2, 7.7 and Appendices 1–4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures relating to the aquatic environment. A fish habitat compensation plan is being developed to offset the impacts of the Project to fish habitat. Should the information on fish habitat impacts change during the detailed design phase of the project, the final fish habitat compensation plan may be revised. Aboriginal groups will also be provided an opportunity to review the final fish habitat compensation plan during the regulatory (permitting) phase of the Project prior to the issuance of a Fisheries Act authorization. Fisheries and Oceans Canada will engage further with Aboriginal groups during the detailed design and regulatory phases of the Project as required.

Comment ID#	Group	Subject	Comment	
8	Lax Kw'alaams	Aquatic environment—water quality	Concerned with sanitary disposal of wastewater from the facility and ships and with the resulting cumulative effects.	
9	Lax Kw’alaams	Archaeological and heritage resources	Concerned with the methodology of the archaeological impact assessment.	
10	Lax Kw’alaams and Metlakatla	Archaeological and heritage resources	Concerned with additional archaeological sites being impacted.	

	Summary of Proponent Response	Agency Response
	Treated stormwater, wastewater and sewage will all be discharged into the marine environment from outfall pipes embedded within the marine terminal causeway. All water discharged into the marine environment will be treated prior to its release: sewage will pass through a Type II treatment system, runoff from roads and parking lots will be routed to a below-ground oil/water separator, and all other types of waste water will be directed through a pond/wetland complex. All effluent discharged into the marine environment will comply with federal water quality objectives, including guidelines for total suspended solids, fecal coliforms and hydrocarbons. As discussed in Section 2.5.4 of the EIS, all vessels using the terminal will be required to follow the Ballast Water Control and Management Regulations, pursuant to the *Canada Shipping Act*, while bilge, sewage and grey water is regulated under the MARPOL, Annexe IV "Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals".	Sections 5.2, 7.7 and Appendices 1-4 outline the potential effects, mitigation measures, environmental effects analysis, commitments and follow-up measures relating to the aquatic environment. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	The Archaeological Impact Assessment (AIA) is available for review upon request. It should be noted that this AIA is only one of many archaeological assessments that has been completed on Ridley Island. Participation in completion of the AIA and a TUS was requested via letter sent July 7, 2011. The Gitxaala were the only ones to respond to this request and therefore were the only group to participate in completion of the AIA. In addition to the project specific AIA that was completed, upwards of six additional AIA and Archaeological Overview Assessments covering Ridley Island and the surrounding areas have been completed. Reference to the reports can be found in the EIS and can be provided upon request.	Sections 5.2, 7.9 and Appendices 1–4 outline the potential effects, mitigation measures, effects analysis, commitments and follow-up measures related to the archaeological and heritage resources. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	A chance find protocol will be provided to project development crews to address any archaeological issues that may unexpectedly arise. This protocol will be provided to Aboriginal groups for comment prior to finalizing. In the unlikely event that any burials and artefacts are unexpectedly encountered during construction, such discoveries will be analyzed, treated and stored in accordance with all Aboriginal groups' wishes. If any signs of archaeological remains are encountered during construction, additional archaeological assessments and monitoring will be carried out as necessary. Canpotex agrees to the creation of a human remains policy prior to project development in the unlikely event that any such remains are encountered. The policy will be drafted by a professional archaeologist with extensive human remains experience and provides for comment by Aboriginal groups. The intent is to include this policy within the chance find protocol.	Sections 5.2, 7.9 and Appendices 1–4 outline the potential effects, mitigation measures, effects analysis, commitments and follow-up measures relating to the archaeological and heritage resources. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.

Comment ID#	Group	Subject	Comment	
11	Lax Kw'alaams	Archaeological and heritage resources	Concerned with potential impacts and management of culturally modified trees (CMT's).	
12	Metlakatla	Current use of lands and resources for traditional purposes by Aboriginal persons—Country Foods	Considers the area around Triple Island to be very important area for harvesting.	
13	All groups	Navigation	Concerned with loss of the ability to navigate and fish in the passage between Ridley Island and Coast Islands.	

	Summary of Proponent Response	Agency Response
	The possibility exists that there are CMTs in the project area. However, given that the maximum age of trees in this area is 30 years it is unlikely that there would be many. The area encompassed by GbTn-36 was an island prior to the infilling, hence the mature forest and presence of six CMTs. The proponent acknowledges the importance of CMTs to Aboriginal groups and will avoid removal wherever possible. When their removal is unavoidable the loss will be mitigated. Mitigation measures will focus on the complete, systematic recording of CMTs. Recording will include the collection of stem-rounds while Aboriginal group representatives are present. When necessary, level II recording will be completed as outlined in the CMT handbook (Archaeology Branch, 2001) including the direct dating of trees by stem-round sampling. No additional compensation is being recommended. The proponents agree to include one or more qualified Lax Kw'alaams representatives on any archaeological crew conducting work on Ridley island.	Sections 5.2, 7.9 and Appendices 1–4 outline the potential effects, mitigation measures, effects analysis, commitments and follow-up measures relating to the archaeological and heritage resources. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	Apart from vessels transiting through this area one to two times per week we do not anticipate increased levels of activity around Triple Island as a result of this project. Use of the anchorages along the eastern shoreline of Stephens Island will be rare, only occurring when a vessel is already at the Canpotex berth. Given the scheduling regime for the arrival and departure of both vessels and trains, an overlap of more than one vessel at berth at a time is not expected.	Sections 5.2, 7.10 and Appendices 1–4 outline the potential effects, mitigation measures, effects analysis, commitments and follow-up measures relating to the current use of lands and resources for traditional purposes by Aboriginal persons. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	To ensure safe and efficient navigation and environmental protection marine traffic will not be allowed to transit in close proximity to, or underneath, the trestle or berth. This is consistent with the regulatory powers of the PRPA as set out in the *Canada Marine Act* and its Regulations and with current practice in Port waters. However, this will not result in the loss of access to fishery resources located between Ridley Island and Coast Island and, during operations, there will be no increase in project related vessel traffic in this area. West of Coast Island there will be an average of one vessel every two days berthed at the new terminal. All vessel activity will be restricted to the shipping lane except when berthing and while at berth. As a result, the only area that will not be available for fishing is the area around the trestle and berth footprint and a 100 m fishing exclusion zone around the berth where fishing may directly interfere with shipping navigation.	Sections 5.2, 7.11 and Appendices 1–3 outline the potential effects, mitigation measures, effects analysis and commitments related to navigation. The Agency is satisfied that the proponent has considered this issue within the EIS, and based on the assessment and identified mitigation measures, concludes the potential effects on vessel traffic will not be significant. Transport Canada is responsible for the regulatory aspects regarding the protection of navigable waters pursuant to the *Navigable Waters Protection Act*. Additional consultation will be undertaken by Transport Canada relating to the impacts of the Project on navigation. The PRPA may undertake additional consultation related to their authorities under the *Canada Marine Act* if applicable.

Comment ID#	Group	Subject	Comment	
14	Lax Kw'alaams	Navigation	Concerned that the current practices of gill netters and sports fishers could be significantly impacted depending on the anchorage location of freighters.	
15	Metlakatla	Navigation	Concerned that the increase in pilotage boats will erode the shoreline and cause a visual impact in their territory.	
16	Kitselas	Accidents and malfunctions	Concerned about increased wildlife mortality due to an increase in rail traffic associated with the project.	

	Summary of Proponent Response	Agency Response
	It is unlikely that these anchorages will be used (i.e., all vessels are expected to go directly to berth). Therefore, it is considered that the project will not increase vessel traffic to these anchorages. Anchorages are addressed in the accidents and malfunctions section. Under rare circumstances, a Canpotex bulk carrier may go to anchor at an approved anchorage near Stephens Island: one situation that may require this would be a vessel already present at the Canpotex berth. However, vessels calling on terminal will arrive and depart at scheduled times for purposes of safety and operational efficiency and therefore overlap is not anticipated.	Sections 5.2, 7.11 and Appendices 1–3 outline the potential effects, mitigation measures, effects analysis and commitments relating to navigation. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	The proponent acknowledges that the Project will result in a minimal increase in pilotage boats travelling through these waters. Issues related to shoreline erosion and visual impacts that result from this minimal increase were not included as part of the project scope. Even so, the proponent does not anticipate any significant effects.	Although this issue was not within the scope of the environmental assessment, the Agency accepts the proponent's conclusion that any potential for issues related to shoreline erosion and visual impacts would be unlikely.
	The proponent acknowledges that fluctuations in rail traffic will affect ungulate mortality caused by train collisions. This potential effect was assessed in Section 18.9.1, Accidents and Malfunctions, of the EIS. The relationship between rail traffic and ungulate mortality was calculated and extrapolated to predict the number of ungulate collisions that might result from the additional rail traffic for the Canpotex project. The estimated effect of this project is that it will increase mortality by 2.5 moose per year and by 0.6 deer per year over the 225 km length of the rail line (please see EIS Section 18.9.3 for detailed calculations). Cumulative effects were assessed by predicting the number of ungulate collisions that might result from the additional rail traffic for several other projects in the area including the Fairview Phase II Project and RTI. The Fairview Phase II development is predicted to increase mortality by 5 moose per year and the RTI project by 5.5 moose per year. Including the Canpotex project the predicted cumulative mortality will increase by 12.98 moose per year over the 225 km rail line. For moose, this total mortality represents approximately 2.7 to 3.7 percent of the Skeena Island Area population.	Sections 5.2, 7.13, and 7.15 outline the potential effects and mitigation measures related to accidents and malfunctions and the assessment of cumulative effects, including the potential for train collisions with ungulates. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.

Comment ID#	Group	Subject	Comment	
17	Kitsumkalum	Accidents and Malfunctions	Concerned about increased salinity effects on eulachon both in the project area and up the Skeena River due to derailment.	
18	Metlakatla	EA process	Concern that the EA timelines are too quick. They're facing capacity issues because four other EAs in their territory have concurrent and overlapping deadlines.	

	Summary of Proponent Response	Agency Response
	The potential effects to eulachon have been assessed in the EIS and the report 'Proposed Disposal at Sea Sites' where the effects to fish were assessed (EIS sections 12, 15 and 18). In the unlikely event of a potash spill into the Skeena River, potash will dissolve and be diluted, ultimately being delivered to the marine environment as potassium and chloride ions (which occur naturally in seawater). Freshwater organisms most likely to be affected will be those directly in the path of the spilled salt; however, since areas of high potash concentration will be diluted rapidly by flow and mixing, localized increases in salinity will not be long-lasting. Potash spilled along the river bank and in shallow, low-flow portions of the Skeena River will be contained and recovered, to reduce potential effects of long term exposure to increased salinity levels.	Sections 5.2, 7.13 and Appendix 3 outline the potential effects and mitigation measures related to accidents and malfunctions, including the potential for train derailment or a potash spill to the marine environment. The Agency is satisfied that the proponent has considered this issue within the EIS and, taking into account the identified mitigation measures, concludes that there will be no significant adverse environmental effect associated with this activity.
	The proponent recognizes Metlakatla's concerns and has forwarded them to the CEA Agency.	The environmental assessment is subject to the requirements and timelines established in the *Canadian Environmental Assessment Act* and the cabinet directive for major resource projects.