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TABLE OF CONCORDANCE

A completed Table of Concordance is provided in Volume 4, Part G – Section 22.0: Appendix 1, Table A1-1 which demonstrates concordance between the Approved AIR/EIS Guidelines and the EAC Application/EIS for the Proposed Project. A separate VP-specific Table of Concordance has also been provided in Volume 4, Part G – Section 22.0: Appendix 1, Table A1-2 in response to the CEA Agency's request.

PREFACE TO THE EAC APPLICATION / EIS

BURNCO Rock Products Ltd. (the Proponent) is proposing to construct and operate a sand and gravel mine ("the Proposed Project") within the Lower McNab Valley, approximately 22 kilometres (km) west-southwest of Squamish and 35 km northwest of Vancouver. The land based activities for the Proposed Project are entirely contained within land that has been privately owned since 2008. Marine barge loading are contained within privately held water lot leases, and barge shipping will be conducted within public marine waters. The property is accessible only by water, air or all-terrain vehicle (via a deactivated logging road network).

The Proposed Project is subject to environmental assessment (EA) under the British Columbia *Environmental Assessment Act*, SBC 2002, c.43 (BCEAA) since the proposed production rate exceeds the threshold specified in the *Reviewable Projects Regulation* (B.C. Reg. 370/2002) (i.e., > 500,000 tonnes/year of excavated sand or gravel or both sand and gravel during at least one year of its operation, or over a period of < 4 years of operation, > 1,000,000 tonnes of excavated sand or gravel or both sand and gravel).

The *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force on July 6, 2012. Since the Notice of Commencement for the BURNCO Aggregate Project EA was posted to the Canadian Environmental Assessment Registry (CEAR) on April 28, 2010 (i.e., before July 6, 2012), the EA is subject to the transition provisions of CEAA 2012. The transition provisions require that the BURNCO Aggregate Project continue to be assessed under the former *Canadian Environmental Assessment Act* (former CEAA) as if the former CEAA had not been repealed. The federal EA will continue to follow the requirements of the former CEAA with the Canadian Environmental Assessment Agency (the CEA Agency) exercising the powers and performing the duties and functions of the responsible authority. The Agency has determined that the Proposed Project is subject to a federal review because it is anticipated to require an authorization from Fisheries and Oceans Canada. It has also been determined that a comprehensive study type EA process is required because the proposed production capacity exceeds the threshold specified in the *Comprehensive Study List Regulations* (i.e., 1,000,000 tonnes per year or more).

The Environmental Assessment Certificate Application/Environmental Impact Statement (EAC Application/EIS) for the Proposed BURNCO Aggregate Project has been developed in accordance with:

- Approved Application Information Requirements/Environmental Impact Statement Guidelines (AIR/EIS Guidelines) dated December 16, 2014; and
- Relevant instructions and conditions described in the EA procedural order issued under Section 11 of BCEAA (Section 11 Order) dated June 1, 2010 and amended December 5, 2013.

ACRONYMS AND ABBREVIATIONS

Below is a list of acronyms and abbreviations used in the EAC Application/EIS.

Acronym/ Abbreviation	Definition
>	Greater than
≥	Greater than or equal to
<	Less than
%	Percent
+	Plus
3D	Three-dimensional
°C	Degrees Celsius
µg	Microgram
µg/L	Microgram per litre
µg/m^3	Microgram per cubic metre
µg/m^2/y	Deposition rate of microgram per square metre per year
µm	Micro metres (microns)
A	Ampere
AB	Alberta
AANDC	Aboriginal Affairs and Northern Development Canada
AAQO	Ambient Air Quality Objectives
AIA	Archaeological Impact Assessment
AIR	Application Information Requirements
AMC	Antecedent Moisture Condition
AJB	AJB Investments Ltd a division of the Surespan Group of Companies
AOA	Archaeological Overview Assessment
APEGBC	Association of Professional Engineers and Geoscientists of British Columbia
Application	Environmental Assessment Certificate Application
ARD	Acid Rock Drainage
ATSDR	Agency for Toxic Substances and Disease Registry
BC	British Columbia
BC CSR	British Columbia Contaminated Sites Regulation
BCEAA	British Columbia *Environmental Assessment Act*, SBC 2002, c.43
BCEAO	British Columbia Environmental Assessment Office
BCFS	BC Forest Services
BCH	British Columbia Hydro
BCMoE	British Columbia Ministry of Environment
BCTS	British Columbia Timber Supply
BMP	Best Management Practices
BSFC	Brake Specific Fuel Consumption
BURNCO	BURNCO Rock Products Ltd.
CAC	Criteria Air Contaminants
CAD	Computer Assisted Graphics

Acronym/ Abbreviation	Definition
CALA	Canadian Association for Laboratory Accreditation Inc.
Cal OEHHA	California Office of Environmental Health Hazard Assessment
CALPUFF	California Puff model (air dispersion model)
CALMET	California Meteorological model (pre-processor to CALPUFF)
CCC	Crown Consultation Coordinator
CCME	Canadian Council of Ministers of the Environment
CDN	Canadian
CE	Cumulative Effects Assessment
CEA Agency	Canadian Environmental Assessment Agency
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEAR	Canadian Environmental Assessment Registry
CG	continuous grading
CHRs	Community Heritage Registers
CK	Community Knowledge
cm^2	Square centimetre
cm/hour	Centimetre per hour
CMT	Culturally Modified Tree
CN	Curve Number
CNI	Canadian National Investments
COPC	Contaminant of Potential Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
db	Decibel(s)
DEM	Digital Elevation Model
DFO	Fisheries and Oceans Canada (Previously Department of Fisheries and Oceans)
DWT	Deadweight Tonnage (DWT)
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EC	Environment Canada
ECCC	Environment and Climate Change Canada
ECS	Environmental Construction Specifications
e.g.	*exempli gratia* (for example)
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EISGs	Environmental Impact Statement Guidelines
EMP	Environmental Management Programme or Environmental Management Plan
EMPR	Energy Mines Petroleum Resources
EMS	Environmental Management System
EPT	*Ephemeroptera, Plecoptera, Trichoptera*
EVC	Existing Viewing Condition
FA	Federal Authority

Acronym/ Abbreviation	Definition
FAO	Food and Agricultural Organization of the United Nations
FISS	Fisheries Information Summary System
former CEAA	*Canadian Environmental Assessment Act*, S.C. 1992, c.37
g	gram
gal	gallon
GDP	Gross Domestic Product
GSB	Geological Survey Branch
GHG	Greenhouse gas
GIS	Geographic Information System
Golder	Golder Associates Ltd.
gpm	gallons per minute
GPS	Global Positioning System
h	hour
ha	hectares
HADD	Harmful Alteration, or Disruption or Destruction of Fish Habitat (Section 35 - *Fisheries Act*, 2012)
HCA	*Heritage Conservation Act*
HC	Health Canada
HHRA	Human Health Risk Assessment
hp	horsepower
HQ	Hazard quotient
HRIA	Heritage Resource Impact Assessment
HROA	Heritage Resource Overview Assessment
HSDB	Hazardous Substances Data Bank
HSLP	Howe Sound Pulp and Paper Limited Partnership
IDF	Intensity-Duration-Frequency
IDNR	Iowa Department of Natural Resources
IDZ	Initial Dilution Zone
i.e.	*id est* (that is)
IEM	Independent Environmental Monitor
ILCR	Incremental lifetime cancer risk
IT	Islands Trust
I5	industrial use
IWMS	Integrated Wildlife Management Strategy (IWMS)
kg	Kilogram
km	kilometre
km/h	Kilometre per hour
kPa	kilo Pascal
kW	kilo Watt
kWh	kilo Watt hour
lb	pound

Acronym/ Abbreviation	Definition
LAI	Leaf Area Index
L/cm^3	Litre per cubic centimetre
L/hour	Litre per hour
LNG	Liquid Natural Gas
LOC	Level of Confidence
LRMP	Land Resource Management Plan
LSA	Local Study Area
m	metres
M	Million
m/s	Metres per second
MAD	Mean Annual Discharge
MARR	BC Ministry of Aboriginal Relations and Reconciliation
masl	Metres above sea level
MBE	Mean Basin Elevation
MEMPR	British Columbia Ministry of Energy Mines
MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
mg/kg BW/day	Milligram per kilogram body weight per day
mg/dm^2/day	Deposition rate of milligram per decimeter square per day
mg/L	Milligram per litre
ML	Metal Leaching
mm	millimetre
MM5	Fifth-Generation Mesoscale Model
MoE	British Columbia Ministry of Environment
MOU	Memorandum of Understanding
MPMO	Major Projects Management Office (Canada)
MPOI	Maximum point of impingement
MSDS	Material Safety Data Sheet
MSHWMP	Material Storage, Handling and Waste Management Plan
MTPA	Million tonnes per annum (year)
MPMO	Major Projects Management Office
N/A	Not applicable
NAAQO	National Ambient Air Quality Objectives
NAPS	National Air Pollution Surveillance
NCAR	National Center for Atmospheric Research
NOAEL	No observed adverse effect level
NOAH	National Centers for Environmental Prediction/Oregon State University/Air Force/Hydrologic Research Lab
NOW	Notice of Work
NO_2	Nitrogen Dioxide
NRC	Natural Resources Canada
NSF	National Sanitation Foundation

Acronym/ Abbreviation	Definition
NWPA	*Navigable Waters Protection Act*
OCP	Official Community Plan
OGC	Oil and Gas Commission
OGMA	Old Growth Management Areas (OGMAs)
OMOE	Ontario Ministry of the Environment
OUS	Occupation and Use Study
PEP	Provincial Emergency Program
PBL	Planetary Boundary Layer
PM	Particulate Matter
$PM_{2.5}$	Particles nominally smaller than 2.5 µm in diameter
PM_{10}	Particles nominally smaller than 10 µm in diameter
POA	Palaeontological Overview Assessment
ppm	Parts per Million
POD	Points of Diversion
POR	Point of Reception
Proposed Project	Proposed BURNCO Aggregate Project
Proponent	BURNCO Rock Products Ltd.
QEP	Qualified Environmental Professional
Q1	First quarter (January to March)
Q2	Second quarter (April to June)
Q3	Third quarter (July to September)
Q4	Fourth quarter (October to December)
RA	Responsible Authority
RfD	Reference dose
RH	Relative humidity
RPD	Relative Percent Difference
RIC	Resource Inventory Committee (now RISC)
RISC	Resource Inventory Standards Committee
RPR	Reviewable Projects Regulation
RSA	Regional Study Area
RSL	Regional Screening Level
RoW	Right-of Way
s	second
RU2	rural land use
SARA	*Species at Risk Act*
SCRD	Sunshine Coast Regional District
Section 11 Order	EA review procedures issued under Section 11 of BCEAA
SLRA	Screening Level Risk Assessment
SPERP	Spill Prevention and Emergency Response Plan
SSAQMP	Sea-to-Sky Air Quality Management Plan
stph	short tons per hour

Acronym/ Abbreviation	Definition
SO_2	sulphur dioxide
SO_x	Sulphur oxides
TC	Transport Canada
TDG	Transportation of Dangerous Goods
TDS	Total Dissolved Solids
TEK	Traditional Ecological Knowledge
TEM	Terrestrial Ecosystem Mapping
THLB	Timber Harvesting Land Base
Tonne/year	Metric tonne per year
TPA	Tonnes per Annum
TPY	Tonnes per Year
TRIM	Terrain Resource Information Mapping
TSP	Total Suspended Particulates
TSP_{30}	Total Suspended Particulates nominally smaller than 30 µm in diameter
TSP_{15}	Total Suspended Particulates nominally smaller than 15 µm in diameter
TSS	Total Suspended Solids
UTM	Universal Transverse Mercator
USDI	United States Department of the Interior
US EPA	United States Environmental Protection Agency
V	Volt
VC	Valued Component
VKT	Vehicle Kilometres Traveled
VLI	Visual Landscape Inventory
VQO	Visual Quality Objectives
VRI	Vegetative Resource Inventory
VRM	Visual Resource Management
VSC	Visual Sensitivity Class
VSU	Visual Sensitivity Unit
WHMIS	Workplace Hazardous Materials Information System
WQG	British Columbia Water Quality Guidelines
WRAP	Western Regional Air Partnership
WSC	Water Survey of Canada
y	year

EXECUTIVE SUMMARY

Purpose of the Application

BURNCO Rock Products Ltd.'s (BURNCO, the Proponent) BURNCO Aggregate Project (Proposed Project) is subject to environmental assessment review under the British Columbia *Environmental Assessment Act* since the proposed production rate is greater than 500,000 tonnes/year of excavated sand and/or gravel. The Proposed Project is also subject to a comprehensive study review under the former *Canadian Environmental Assessment Act* as a result of a required approval under the *Fisheries Act* and a proposed production capacity greater than 1,000,000 tonnes per year. The Environmental Assessment Certificate Application / Environmental Impact Statement (EAC Application/EIS) is designed to provide information required to satisfy both federal and provincial EA processes.

Environmental assessment (EA) provides an integrated process for identifying and evaluating potential adverse environmental, economic, social, heritage and health effects that may occur during the life of a Proposed Project. The purpose of EA is to predict the significance of potential project-related effects and to identify measures to avoid or reduce these potential effects through redesign and operational improvements. Conclusions of the assessment inform decisions on whether or not a Proposed Project should proceed. The EA of the Proposed BURNCO Aggregate Project reflects accepted federal and provincial EA standards and guidelines.

Project Description

BURNCO is proposing to construct and operate a sand and gravel mining operation within Lower McNab Valley located in Howe Sound, approximately 35 km northwest of Vancouver (Figure 1). The Proposed Project will be developed in 70 hectare (ha) of the southern portion of a 320 ha property that has been privately-owned by BURNCO since 2008 ("the Property"). Much of the Proposed Project area has been previously cleared. Logging operations in proximity to Proposed Project area continue to operate and to make use of the log handling area located on the western shore of the Property.

The Proposed Project will include an 30 ha aggregate pit within a flat glacial fan-delta deposit on the western shore of Thornbrough Channel, north of the existing BC Hydro transmission corridor that crosses the Property. Approximately 20 million tonnes of sand and gravel will be extracted over the 16 year life of the Proposed Project.

Because there is a relatively shallow water table in this area, once the site has been cleared the aggregate resource will be extracted using a clamshell dredge mounted on a floating barge. Aggregate materials will be conveyed to a processing area where sand and gravel products will be stockpiled (Figures 2 and 3). A high-efficiency wash plant will use 95% recycled washwater; fines and silt will be removed from the process water for on-site disposal and reclamation. No wash water will be discharged.

The processed aggregate material will be conveyed to barges for shipment to BURNCO's existing facilities in Burnaby or Langley (Figure 4). The Proposed Project will provide sand and gravel that will be used to meet the growing demands of the BC marketplace.

Progressive and ongoing reclamation activities will occur throughout all phases of the Proposed Project. A Reclamation and Effective Closure Plan has been prepared that describes measures to manage, maintain and

monitor water management structures, remove surface facilities, and develop a functional ecosystem in the freshwater pit that will remain. Visual simulations of the Proposed Project before, during and post operations are presented in Figures 5, Figure 6, and Figure 7, respectively.

Environmental Setting

The Proposed Project is located in Howe Sound, north of Gambier Island. The Proposed Project site is a glacially-derived sand and gravel fan-delta near sea level (10 to 50 m above sea level [asl]) at the mouth of a glaciated coastal mountain valley, on the shore of a fjord. The mountain peaks that surround the valley reach a height of more than 1,500 m asl, although the topography of the Property is relatively flat.

The ecosystem of the Proposed Project area is Coastal Western Hemlock (CWH) very wet maritime biogeoclimatic zone, submontane (CWHvm1) variant. The CWH zone transitions, with increased elevation, to the Mountain Hemlock (MH) zone, which transitions to the Coastal Mountain-heather Alpine (CMA) zone. These ecosystems are composed of old growth forests, mature forest, wetlands, shrub-dominated sapling forest, and young forest structural stages, and un-vegetated or sparsely vegetated areas. Mature forest occurs mainly on the east side of McNab Creek and in the upper elevations. Much of the Proposed Project area is in various stages of regeneration following logging; it is dominated by shrubs, sapling forests, and young forests between 40 and 80 years old.

The summer climate in the Proposed Project area is typically warm and dry. Between June and late September, the average temperature is 20°C to 28°C. Winters between November and February are typically mild and wet, with an average temperature range between 0°C and 10°C. Although snowfall occurs occasionally, most of the precipitation is in the form of rain.

The Proposed Project is located in hydrologic subzone 9B, Southern Coastal Mountain and comprises a portion of the McNab valley and watershed (BC Watershed Code 900-106300). The McNab Creek watershed is further classified as part of the Southern Pacific Ranges Ecosection, which is characterized by glaciated U-shape valleys. Upper valley slopes are generally steep, with a mantle of till glacial material or exposed bedrock. The lower valley slopes are generally flat with predominantly coarse substrate in the valley bottoms along the mainstream watercourses. McNab Creek flows along the east side of the Proposed Project area. Where it flows adjacent to the Proposed Project, McNab Creek has a low-gradient channel with gravel and cobble bars. McNab Creek is a 12.7-km long fourth-order watercourse that drains directly into the marine environment of Howe Sound.

There are no glaciers and few alpine areas of late-persisting snow within the watershed. Typical of coastal watersheds, the highest stream flow in McNab Creek occurs during the autumn/winter months (October through January), when rainfall is greatest. From February onward, average monthly flow declines until late summer (August), when the lowest flows occur. Flows increase abruptly with the onset of the autumn rains in September and October.

Much of the McNab Creek watershed is covered by thick forest, while the upper slope areas have limited vegetative cover, consistent with steep slopes nearing the alpine limit of forests.

The valley floor groundwater regime in the Proposed Project area during the summer months is characterized by an overall southward flow direction becoming progressively lower (i.e., flatter) toward the south. Within the central and southern portions, the regime is characterized by convergent southwest and southeastward flows (i.e., toward

WC 2). The convergent flow is interpreted by WC 2 which is a deeply excavated channel that acts as an artificial groundwater drainage pathway that reduces groundwater levels in adjacent areas and alters both flow directions and gradients. Groundwater flow patterns during the winter are similar to those observed during summer; however, the hydraulic heads are overall higher, in particular in the west portion of the valley fill aquifer.

On rare occasions between July and September, tidal elevations can exceed groundwater elevations. During these high tide intervals, the northward tidal gradient interferes with the groundwater regime in the immediate vicinity of the shoreline. However, the duration of the tidal gradient is less than the corresponding periods of southward groundwater gradient. Accordingly, the net groundwater flow direction remains southward toward the marine foreshore, despite the observed tidal influence.

The marine foreshore of the Proposed Project area comprises an intertidal sand, gravel and cobble beach that extends an average of 150 to 300 m outward from the high tide line. At its seaward edge (approximately 200 m from the high tide line), it drops off sharply to a depth of more than 200 m. The intertidal/subtidal area has been historically impacted by log booming and log dumping activities.

Key Environmental Effects and Mitigation

Potential effects of all phases of the Proposed Project – Construction, Operations, and Reclamation and Closure – were assessed where there is a potential interaction with selected Valued Components. Summaries of potential effects assessed and proposed mitigation for each key issue is presented in Table 1-1 and Table 1-2, respectively. Brief summaries of predicted residual effects of the Proposed Project are provided below. Details are presented in Sections 5 to 9 of the EAC Application/EIS.

Table 1-1: Summary of Potential Effects Assessed

Valued Component	Potential Effects Assessed		
	Construction	Operations	Reclamation and Closure
ENVIRONMENTAL			
Fisheries and Freshwater Habitat			
Anadromous Chum Coho and Cutthroat Trout and their Habitats	■ Changes to surface water quality - suspended sediments ■ Changes to surface water quality - cementitious (alkaline) material ■ Effects of artificial lighting	■ Loss of habitat ■ Changes to surface water quality - suspended sediments ■ Effects of artificial lighting	■ Loss of habitat ■ Changes to surface water quality - suspended sediments ■ Effects of artificial lighting
Resident Cutthroat Trout and their Habitat	■ Changes to surface water quality - suspended sediments ■ Changes to surface water quality - cementitious (alkaline) material ■ Effects of artificial lighting	■ Loss of habitat ■ Changes to surface water quality - suspended sediments ■ Effects of artificial lighting	■ Loss of habitat ■ Changes to surface water quality - suspended sediments ■ Effects of artificial lighting

Valued Component	Potential Effects Assessed		
	Construction	Operations	Reclamation and Closure
Marine Resources			
Marine Water and Sediment Quality	■ Changes in marine water and sediment quality	■ Changes in marine water and sediment quality	■ Changes in marine water and sediment quality
Benthic Communities	■ Loss of habitat ■ Changes in habitat quality - In-water works ■ Changes in habitat quality – Propeller scour ■ Potential mortality - In-water works ■ Potential mortality – Propeller scour	■ Changes in habitat quality – Propeller scour ■ Potential mortality – Propeller scour	■ Changes in habitat quality - In-water works ■ Changes in habitat quality – Propeller scour ■ Potential mortality - In-water works ■ Potential mortality – Propeller scour
Marine Fish	■ Loss of habitat ■ Changes in habitat quality - In-water works ■ Changes in habitat quality – Propeller scour ■ Mortality/injury – underwater noise (pile driving)	■ Changes in habitat quality – Propeller scour	■ Changes in habitat quality - In-water works ■ Changes in habitat quality – Propeller scour
Marine Mammals	■ Mortality/injury – vessel strikes ■ Mortality/injury – underwater noise (pile driving) ■ Behavioural disturbance – underwater noise (pile driving, vessels)	■ Mortality/injury – vessel strikes ■ Behavioural disturbance – underwater noise (vessels, barge loading)	■ Mortality/injury – vessel strikes ■ Behavioural disturbance – underwater noise (vessels)
Marine Birds	■ Behavioural disturbance – in-air noise (pile driving, vessels)	■ Behavioural disturbance – in-air noise (vessels, barge loading)	■ Behavioural disturbance – in-air noise (vessels)
Terrestrial Wildlife and Vegetation			
Amphibian species at risk (i.e., red-legged frog, western toad, Pacific tailed frog)	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Western screech owl	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Common nighthawk	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Northern goshawk	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Band-tailed pigeon	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Marbled murrelet	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality

Valued Component	Potential Effects Assessed		
	Construction	Operations	Reclamation and Closure
Roosevelt elk	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Grizzly bear	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality	■ Habitat loss ■ Barriers to movement ■ Change in mortality
Environmentally sensitive ecosystems (wetlands, riparian ecosystems, old growth forest)	■ Loss of extent ■ Surface runoff ■ Introduction of dust ■ Invasive species ■ Soil disturbance ■ Windthrow ■ Introduction of deleterious substances	■ Surface runoff ■ Introduction of dust ■ Invasive species ■ Soil disturbance ■ Windthrow ■ Introduction of deleterious substances	■ Introduction of dust ■ Invasive species ■ Soil disturbance ■ Introduction of deleterious substances
Ecosystems at-risk	■ Loss of extent ■ Surface runoff ■ Introduction of dust ■ Invasive species ■ Soil disturbance ■ Windthrow ■ Introduction of deleterious substances	■ Loss of extent ■ Surface runoff ■ Introduction of dust ■ Invasive species ■ Soil disturbance ■ Windthrow ■ Introduction of deleterious substances	■ Introduction of dust ■ Invasive species ■ Soil disturbance ■ Windthrow ■ Introduction of deleterious substances
Plant Species at Risk	■ Loss of extent ■ Introduction of deleterious substances	■ Introduction of deleterious substances	■ Introduction of deleterious substances
Geotechnical and Natural Hazards			
Earthquakes and tsunamis	■ Increased ground movement during earthquake event ■ Increased shoreline erosion and offshore debris deposition during earthquake or landslide generated tsunami ■ Initiation of submarine landslides	■ Increased ground movement during earthquake event ■ Increased shoreline erosion and offshore debris deposition during earthquake or landslide generated tsunami ■ Initiation of submarine landslides	■ Increased ground movement during earthquake event ■ Increased shoreline erosion and offshore debris deposition during earthquake or landslide generated tsunami ■ Initiation of submarine landslides
Terrain stability	■ Land-based mass movement - Terrain stability: o changes to slope morphology or drainage conditions o changes to debris flow-debris flood transport or run out zones	■ Land-based mass movement - Terrain stability: o changes to slope morphology or drainage conditions o changes to debris flow-debris flood transport or run out zones	■ Land-based mass movement - Terrain stability: o changes to slope morphology or drainage conditions o changes to debris flow-debris flood transport or run out zones
Climate	■ None or negligible	■ None or negligible	■ None or negligible

Valued Component	Potential Effects Assessed		
	Construction	Operations	Reclamation and Closure
Surface Water Resources			
Surface Water Flow	■ Changes in baseflow in WC2	■ Changes in baseflow in WC2	■ Changes in baseflow in WC2
Surface Water Quality	■ Changes to water quality – suspended sediments ■ Changes to water quality - spills	■ Changes to water quality – suspended sediments ■ Changes to water quality - spills	■ Changes to water quality – suspended sediments ■ Changes to water quality - spills
Aquatic Health	■ Direct toxicity-related effects ■ Nutrient enrichment-related effects	■ Direct toxicity-related effects ■ Nutrient enrichment-related effects	■ Direct toxicity-related effects ■ Nutrient enrichment-related effects
Groundwater Resources			
Groundwater Flow	■ Changes in groundwater flow	■ Changes in groundwater flow	■ Changes in groundwater flow
Groundwater Quality	■ Changes in groundwater quality	■ Changes in groundwater quality	■ Changes in groundwater quality
Air Quality			
Air Quality Indicators	■ Increase in PM2.5 – 24-hour ■ Increase in PM2.5 – Annual ■ Increase in PM10 – 24-hour ■ Increase in TSP – 24-hour ■ Increase in TSP – Annual ■ Increase in NO2 – 1-hour, tug boats ■ Increase in NO2 – Annual, tug boats ■ Increase in NO2 – 1-hour, tug boats	■ Increase in PM2.5 – 24-hour ■ Increase in PM2.5 – Annual ■ Increase in PM10 – 24-hour ■ Increase in TSP – 24-hour ■ Increase in TSP – Annual ■ Increase in NO2 – 1-hour, tug boats ■ Increase in NO2 – Annual, tug boats ■ Increase in NO2 – 1-hour, tug boats	■ Increase in PM2.5 – 24-hour ■ Increase in PM2.5 – Annual ■ Increase in PM10 – 24-hour ■ Increase in TSP – 24-hour ■ Increase in TSP – Annual ■ Increase in NO2 – 1-hour, tug boats ■ Increase in NO2 – Annual, tug boats ■ Increase in NO2 – 1-hour, tug boats
Climate Change			
GHG Emissions	■ Change in GHG emissions	■ Change in GHG emissions	■ Change in GHG emissions
ECONOMIC			
Sustainable Economy			
Regional Economic Development	■ Positive	■ Positive	■ None or negligible
Labour Market	■ Employment and income generating opportunities for local residents o Direct employment o Indirect employment o Induced employment	■ Employment and income generating opportunities for local residents o Direct employment o Indirect employment o Induced employment	■ None or negligible
Local Government Revenue	■ Positive	■ Positive	■ None or negligible

Valued Component	Potential Effects Assessed		
	Construction	Operations	Reclamation and Closure
Real Estate	■ Construction activities would generate effects on noise, air quality and visual resources, thereby potentially affecting financial value of real estate adjacent to the Proposed Project area.	■ Operational activities would result in a change in land use and zoning of the Property and generate effects on noise, air quality and visual resources, thereby potentially affecting financial value of real estate adjacent to the Proposed Project area.	■ None or negligible
SOCIAL			
Social Conditions			
Housing and Accommodations	■ Change in demand for housing and temporary accommodation affecting housing affordability and availability	■ Change in demand for housing and temporary accommodation affecting housing affordability and availability	■ Change in demand for housing and temporary accommodation affecting housing affordability and availability
Emergency Services	■ Change in demand for emergency services exceeding supply/capacity	■ Change in demand for emergency services exceeding supply/capacity	■ None or negligible
Marine Transportation			
Marine Navigation	■ Interference with navigation use and navigability due to Project-related vessel traffic ■ Interference with navigation use and navigability due to Project-related infrastructure	■ Interference with navigation use and navigability due to Project-related vessel traffic ■ Interference with navigation use and navigability due to Project-related infrastructure	■ Interference with navigation use and navigability due to Project-related vessel traffic ■ Interference with navigation use and navigability due to Project-related infrastructure
Vessel Wake	■ None or negligible	■ None or negligible	■ None or negligible
Non-Traditional Land and Resource Use			
Forestry	■ None or negligible	■ None or negligible	■ None or negligible
Harvesting Fish and Wildlife	■ Change in quality of environmental setting	■ Change in quality of environmental setting	■ Change in quality of environmental setting
Recreation and Tourism	■ Change in quality of environmental setting	■ Change in quality of environmental setting	■ Change in quality of environmental setting
Minerals and Aggregates	■ None or negligible	■ None or negligible	■ None or negligible
Visual Resources			
Visual Quality	■ Change in visual quality	■ Change in visual quality	■ Positive
HERITAGE			
Heritage Resources			
Heritage Resources	■ Changes to integrity ■ Changes to context ■ Changes to accessibility	■ Changes to integrity ■ Changes to context ■ Changes to accessibility	■ Changes to integrity ■ Changes to context ■ Changes to accessibility

Valued Component	Potential Effects Assessed		
	Construction	Operations	Reclamation and Closure
HEALTH			
Public Health			
People	■ Human Health – Air Quality ■ Human Health – Particulate Matter ■ Human Health – Multimedia	■ Human Health – Air Quality ■ Human Health – Particulate Matter ■ Human Health – Multimedia	■ Human Health – Air Quality ■ Human Health – Particulate Matter ■ Human Health – Multimedia
Noise			
Noise Levels	■ Increase in noise levels	■ Increase in noise levels	■ Increase in noise levels

Table 1-2: Summary of Proposed Mitigation

Proposed Mitigation	
No.	**Description**
ENVIRONMENTAL	
Fisheries and Freshwater Habitat	
M-5.1-01	Implementation of the Fish Habitat Offset Plan (Volume 4, Part G – Section 22.0: Appendix 5.1-B). Extension of the lower segment WC 2 will collect surface flow diverted through loss of the upper segment and will increase the wetted area within the extension and the lower segment of WC 2.
M-5.1-02	Designing the pit lake such that lake elevation can be used to manage hydrostatic pressure through the course of operations so changes to groundwater flow does not lead to a loss of flow within McNab Creek.
M-5.1-03	Similarly, the elevation of the pit lake will be used to manage baseflows in the natural groundwater watercourses below the pit lake.
M-5.1-04	Disturbed areas should be vegetated as soon as possible and where possible by planting and seeding with native trees, shrubs, and grasses.
M-5.1-05	Disturbed areas adjacent to watercourses should be covered with mulch for sediment control.
M-5.1-06	Develop and implement an Erosion and Sediment Control Plan (See Volume 4, Part G – Section 22.0: Appendix 3). Measures should be maintained until re-vegetation is achieved.
M-5.1-08	Fines/silt cakes berm should be vegetated as soon as possible and where possible by planting and seeding with native trees, shrubs, and grasses.
M-5.1-09	Placement of erosion control blankets on the berm to prevent dust.
M-5.1-11	Crushing area should receive water-misting during dry weather events to reduce dust release.
M-5.1-12	Complete isolation of work area is required to ensure waterbodies do not become more alkaline.
M-5.1-13	pH should be monitored in surrounding waterbodies during concrete pouring.
M-5.1-14	Best Management Plans (BMPs) should be implemented during setting, mixing, and pouring of concrete to ensure activities meet requirements of applicable legislation.
M-5.1-15	Pre-cast concrete structures whenever possible.
M-5.1-16	Keep carbon dioxide tank with regulator, hose, and gas diffuser readily available during concrete works.
M-5.1-17	Lighting for the purposes of the aggregate mining will not be permitted between dusk to dawn at seasonally appropriate times.
M-5.1-18	All Lighting nearby waterbodies will have baffles to direct light away from the water surface.
M-5.1-19	Limited Lighting will be maintained through the night only for safety purposes.
M-5.1-20	Develop and implement a Spill Prevention and Emergency Response Plan (Volume 3, Part E – Section 16.0).
M-5.7-01	Develop and implement an Air Quality and Dust Control Management Plan (Volume 3, Part E – Section 16.0) that will detail measures to control fugitive particulates (e.g., watering and speed controls).
Marine Resources	
M-5.1-01	Develop a Fish Habitat Offset Plan to offset unavoidable permanent alteration or destruction of fish habitat from Project works (Volume 4, Part G – Section 22.0: Appendix 5.1-B).
M-5.1-20	Develop and implement a Spill Prevention and Emergency Response Plan (Volume 3, Part E – Section 16.0).

Proposed Mitigation	
No.	**Description**
M-5.2-01	Mitigation through design: ■ Utilize existing disturbed features - installation of barge load-out jetty in low value habitat (existing log dump) ■ Use of piles instead of fill to reduce seabed disturbance ■ Height and orientation of walkway/conveyor designed to maximize ambient light penetration ■ Maintain tree buffer on foreshore to limit noise and dust emissions to marine environment.
M-5.2-02	Develop and adherence to Construction Environmental Management Plan (CEMP; Volume 3, Part E – Section 16.0).
M-5.2-03	Develop and adherence to Pile Construction Management Plan (Volume 3, Part E – Section 16.0).
M-5.2-04	Environmental monitoring by a qualified Environmental Monitor (EM).
M-5.2-05	Prevent release of construction debris and deleterious substances into the marine environment.
M-5.2-06	Adherence to BMP for Pile Driving and Related Operations (DFO 2003).
M-5.2-07	Adherence to Erosion and Sediment Control Plan (Volume 4, Part G – Section 22.0: Appendix 3) during road and other facilities construction, maintenance and upgrade.
M-5.2-09	Optimal use of pre-cast concrete for construction and installation of facilities within the intertidal and subtidal zones.
M-5.2-10	Concrete will be poured during suitable tides.
M-5.2-11	Concrete is not to be poured directly into tidal waters.
M-5.2-12	Pumping hoses will be equipped with a shut-off valve to stop flow should a spill occur.
M-5.2-13	Short term portable concrete batch plant will be constructed on-site, so no concrete pumping will be conducted by barge.
M-5.2-14	Use of tight-fitting formwork that is lined (e.g., with polyethylene) and that has gasket joints to prevent contact between concrete and tidal water.
M-5.2-15	Barriers will be used as appropriate to prevent splashing of the concrete over the forms and into the water or intertidal area during pouring.
M-5.2-16	Fast curing concrete intended/formulated for marine applications will be used.
M-5.2-17	Following placement of concrete, forms will be left in place isolating the concrete from tidal waters for a minimum of 24 h or time required for the particular material used such that the concrete is cured before it is exposed to tidal waters.
M-5.2-18	Wash down of equipment and tools that have come into contact with concrete will be conducted in a designated area away from intertidal drainages so that concrete products are prevented from entering watercourses.
M-5.2-19	Excess or spilled concrete will be immediately cleaned up / removed from the intertidal area.
M-5.2-20	During removal and storage of creosote pilings, adherence to DFO BMP “Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region”.
M-5.2-21	Vessels involved in in-water works will be positioned in a manner to prevent disturbance to benthic communities and benthic habitats.
M-5.2-22	Work crews will monitor the position of barges and account for height of tidal waters, magnitude of prevailing winds, and direction of tidal currents or other factors that may influence vessel positioning.
M-5.2-23	Maneuvering of vessels in shallow areas will be minimized in order to avoid propeller scour and potential re-suspension of sediments or physical disturbance to shallow submerged marine vegetation.

Proposed Mitigation	
No.	**Description**
M-5.2-24	All equipment will be maintained in proper conditions to prevent leaking or spilling of hydrocarbons and other potentially toxic substances in the marine environment.
M-5.2-25	All hydrocarbon products, fueling equipment and other chemical substances will be stored and handled in accordance with all applicable legislation, guidelines and BMP's to prevent their release and toxic effect in the marine environment.
M-5.2-27	During in-water works with potential to result in increased turbidity or suspended sediment, specific water quality performance objectives (based on BC Water Quality Guidelines) will be applied at set distances from in-water works. In-water works will be halted if objectives are not achieved. Where objectives cannot be practically met, work areas will be isolated from tidal waters with silt curtains or other silt control measures.
M-5.2-28	Implementation of ramp-up / soft-start procedure during impact pile driving
M-5.2-29	Avoid concurrent multiple underwater noise generating activities (sequence where possible).
M-5.2-30	Impact pile driving should not exceed 30 kPa at 10 m from pile. Otherwise, additional mitigation will be implemented such as the use of a vibratory hammer in place of an impact hammer or installation of bubble curtains around the wetted pile.
M-5.2-31	Impact pile driving activities will be temporarily suspended if aggregations of fish (e.g., herring or salmonids) are spotted within the immediate work area or if any herring spawn is observed attached to equipment or structures in the water.
M-5.2-32	Monitoring for marine mammals (MM) during all impact pile driving activities by a qualified and experienced Marine Mammal Observer (MMO).
M-5.2-33	Implementation of a MM Safety Zone based on injury threshold criteria (180 dB re 1 µPa SPLrms for cetaceans and 190 dB re 1 µPa SPLrms for pinnipeds). The occurrence of MM within the safety zone will trigger specific mitigation actions (e.g., shut-downs).
M-5.2-34	Shut-down procedures – impact pile driving will be temporarily suspended when a MM is located within the safety zone until which time it moves outside the safety zone.
M-5.2-35	Conduct a pre-operational search for marine mammals prior to start-up of active impact pile driving. If a marine mammal is spotted within the safety zone during the pre-ops search, the ramp-up procedure will be delayed 20 minutes from the time the marine mammal left the safety zone, or was last sighted in the safety zone
M-5.2-36	MMO will periodically verify underwater sound levels in the field using a hydrophone and a real-time sound monitor to confirm that sound levels at the modeled safety zone radius are below the established injury thresholds for MM. If necessary, the safety zone distance will be adjusted accordingly.
M-5.2-37	Plan operations during daylight hours to maximize detection ability of marine mammals in Project Area.
M-5.2-38	Avoid peak seasonal timing when marine mammals are most likely to be in or adjacent to the Project Area.
M-5.2-39	Speed restrictions for tug-assisted barges in Regional Study Area (RSA) (<12 knots).
M-5.2-40	Vessels will follow established shipping lanes/navigational routes in Regional Study Area (RSA).
M-5.2-41	Vessels will maintain a constant course and constant speed in Regional Study Area (RSA).
M-5.2-42	Project vessels will not approach within 100 m of any marine mammal.
M-5.2-43	If marine mammals approach within 100 m of a Project vessel, the vessel will reduce its speed and, if possible, cautiously move away from the animal. If it is not possible for a vessel to move away from or detour around a stationary marine mammal or group of mammals, the vessel will reduce its speed and wait until the animal(s) moves at least 100 m from the vessel prior to resuming speed.
M-5.2-44	Prevent release of debris and deleterious substances into the marine environment.

Proposed Mitigation	
No.	**Description**
M-9.2-01 to M-9.2-09	Refer to Volume 2, Part B - Section 9.2 (Noise).
Terrestrial Wildlife and Vegetation	
M-5.1-06	Develop and implement an Erosion and Sediment Control Plan (See Volume 4, Part G – Section 22.0: Appendix 3).
M-5.1-20	Develop and implement a Spill Prevention and Emergency Response Plan (Volume 3, Part E – Section 16.0).
M-5.3-01	Identify and retain, where feasible, wildlife habitat features.
M-5.3-02	Utilize existing disturbed areas.
M-5.3-03	Maintain riparian vegetation, vegetation buffers and other important habitat features.
M-5.3-04	Minimize clearing through Project planning.
M-5.3-05	Develop a Vegetation Management Plan including an Invasive Plant Species Management Plan (Volume 3, Part E - Section 16.0).
M-5.3-06	Avoid clearing wildlife habitat during sensitive wildlife periods such as breeding and calving periods, bird nesting periods, and Roosevelt elk overwintering.
M-5.3-07	Restrict construction to daylight hours.
M-5.3-08	Limit Proposed Project area access to a single point, and to employees and contractors.
M-5.3-09	Manage noise through implementation of Best Management Practices (BMPs) and mitigation outlined in Volume 2, Part B - Section 9.2.
M-5.3-10	Maintain vegetation linkages and buffers.
M-5.3-11	Demarcate habitat features to be retained.
M-5.3-12	Identify habitat feature (i.e., woody debris) to retain.
M-5.3-15	Follow appropriate Best Management Practices (BMPs).
M-5.3-16	Fall trees away from sensitive habitat.
M-5.3-17	Develop a Wildlife Management Plan (Volume 3, Part E - Section 16.0).
M-5.3-17a	Mature forest to be cleared will be surveyed for tree cavities that may provide suitable nesting opportunities for Western screech-owl. A density of potentially suitable nest trees will be estimated for the mature forest that will be cleared.
M-5.3-17b	Construct and install nest boxes for Western screech-owl in nearby forest habitat, where appropriate.
M-5.3-18	Develop and implement a progressive Reclamation Plan (Volume 4, Part G – Section 22.0: Appendix 3).
M-5.3-19	Develop and implement a water quality monitoring program in remaining amphibian breeding ponds.
M-5.3-20	Develop and implement a wildlife monitoring program with the objective of measuring the effectiveness of mitigation and restoration measures on wildlife valued components (VCs) within the Local Study Area (LSA).
M-5.3-21	Minimize fugitive dusts from exposed soil, equipment and Project facilities.
M-5.3-22	Monitor water quality in the pit lake.
M-5.3-23	Limit operational hours to daylight hours. Limit nighttime lighting to where lighting is required for safety and security.

Proposed Mitigation	
No.	**Description**
M-5.3-24	Night time lights will be fitted with shades to direct light towards the ground.
M-5.3-25	Monitor water quality in the Pit Lake and other water bodies in and around the Proposed Project area.
M-5.3-26	Develop and implement a Habitat Compensation Plan to address the loss of amphibian breeding habitat and Roosevelt elk habitat.
M-5.3-27	Reclaim the Proposed Project area to enhance wildlife habitat.
M-5.3-28	Develop and implement a progressive Reclamation Plan (Volume 4, Part G – Section 22.0: Appendix 3).
M-5.3-29	Store equipment in designated areas.
M-5.3-30	Design and establish amphibian passageways, where appropriate.
M-5.3-31	Maintain vegetation linkages and buffers.
M-5.3-32	Bury linear features.
M-5.3-33	Develop and implement a Material Storage, Handling and Waste Management Plan and Develop and implement an Erosion and Sediment Control Plan (See Volume 4, Part G – Section 22.0: Appendix 3).
M-5.3-34	Prohibit harassment and feeding of wildlife by Project employees.
M-5.3-35	Report wildlife observations.
M-5.3-36	Develop a Wildlife Management Plan (Volume 3, Part E - Section 16.0).
M-5.3-37	All employees and contractors will be prohibited from hunting, including Roosevelt elk and grizzly bear, within the Local Study Area (LSA).
M-5.3-38	Install amphibian isolation fencing along roadways.
M-5.3-39	Clear during avifauna least risk windows; avoid clearing during sensitive wildlife periods.
M-5.3-40	Control traffic speeds on roads.
M-5.3-43	Train staff to be Bear Aware™.
M-5.3-44	Post educational signage.
M-5.3-46	Conduct a pre-clearing salvage of amphibians in amphibian ponds within the Proposed Project area.
M-5.3-49	Restrict public access to the Proposed Project area.
M-5.3-51	Develop a wildlife mortality reporting program.
M-5.3-52	Obtain a yearly permit to salvage amphibians.
M-5.3-53	Limit nighttime road travel.
M-5.3-54	Maintain vegetative buffers around all raptor nests and other active bird nests.
M-5.3-55	Design the perimeter of the pit lake to allow for an escape route for large mammals.
M-5.3-56	Develop a Material Storage, Handling and Waste Management Plan (Volume 3, Part E - Section 16.0).
M-5.3-57	Project design aims to utilize disturbed areas and avoid sensitive ecosystems.
M-5.3-58	Activities will be contained within surveyed Project boundary.
M-5.3-59	Standing vegetation will be retained for as long as possible.

Proposed Mitigation	
No.	**Description**
M-5.3-60	Reclamation planning will aim to re-establish functional listed ecosystems at the same proportion at which they were removed, where final design allows.
M-5.3-61	Ecological units will be created during the reclamation phase similar to those present prior to Project construction.
M-5.3-62	Develop and implement a vegetation monitoring program to assess the success of mine reclamation.
M-5.3-64	An independent Environmental Monitor (EM) will be on-site during sensitive works.
M-5.3-65	An Air Quality and Dust Control Management Plan will be prepared and implemented during construction, operations and reclamation.
M-5.3-66	Progressive reclamation to be conducted during operations to reduce ambient dust.
M-5.3-67	A site specific Invasive Plant Management Plan will be developed.
M-5.3-68	Progressive reclamation to be conducted during operation to reduce risk of invasive species establishment.
M-5.3-69	A Soil Management Plan, including the Reclamation Plan, will be developed and implemented during construction. The Soil Management Plan will be employed during reclamation and closure.
M-5.3-70	Trees susceptible to windthrow will be removed from treeline edges.
M-5.3-71	Sensitive receptors (i.e., streams) will be buffered so that impacts are minimized.
M-5.3-72	Monitoring of treeline edges will be conducted in order to evaluate potential windthrow effects and adaptive management will be employed, if necessary.
M-5.3-73	A Construction Environment Management Plan (CEMP) will be developed which will include regular inspections of equipment.
M-5.3-75	An independent Environmental Monitor (EM) will be on-site.
M-5.3-76	An Operation Environmental Management Plan will be prepared that includes regular scheduled equipment inspections.
M-5.3-77	Communication and planning with other proponents within McNab Valley.
M-5.3-78	Access management planning with other proponents within McNab Valley.
Geotechnical and Natural Hazards	
M-5.4-01	Conduct detailed geotechnical subsurface investigations (drilling and geophysical programs) where required.
M-5.4-02	Prepare approved engineered design and plans to achieve Proposed Project engineering design and performance requirements and for mitigation, as required by provincial and federal accepted standards
M-5.4-03	Conduct appropriate detailed investigations of terrain stability and geotechnical conditions.
M-5.4-04	Prepare approved engineered design and plans to achieve Proposed Project performance requirements and for mitigation, as required.
M-5.4-05	Conduct appropriate on-site assessments to identify connectivity of site earth works to watercourses.
M-5.4-06	Conduct on-site assessment of terrain stability conditions along watercourse banks and connectivity to planned site activities.
M-5.4-07	Conduct appropriate debris flow/ flood hazard and effect assessments including hydrotechnical assessments that would include peak discharge and sediment concentration estimates.
M-5.4-08	Prepare engineered designs and plans by qualified and experienced professionals for mitigation (e.g., diversion and catchment structures), as required.
M-5.4-09	Conduct operations in conformance with detailed geotechnical designs.

Proposed Mitigation	
No.	**Description**
M-5.4-10	Monitor performance during operations and update or modify designs if required to achieve Proposed Project performance requirements and for mitigation, as required.
M-5.4-11	Conduct appropriate monitoring and ongoing investigations of terrain stability and geotechnical conditions to achieve Proposed Project performance requirements and for mitigation, as required.
M-5.4-12	Conduct recommended monitoring and ongoing debris flow/ flood hazard assessments of watercourse side banks and drainage of changing site conditions were warranted.
M-5.4-13	Conduct reclamation and closure in conformance based on detailed geotechnical designs, monitor performance during reclamation and update or modify designs if required to achieve Proposed Project performance requirements and for mitigation, as required.
M-5.4-14	Based on stockpile location and earth works affecting or indirectly connected to side banks of watercourses, conduct site assessment of terrain stability conditions and soil erosion plans.
M-5.4-15	Includes conducting appropriate on-site assessments to identify connectivity of site earth works to watercourses. For potential debris flow / flood catchment structures, conduct appropriate decommissioning or ongoing monitoring of structures where warranted.
M-5.4-16	As required, prepare engineered designs and plans by qualified and experienced professionals for removal or ongoing mitigation of site.
Surface Water Resources	
M-5.1-01	Implementation of the Fish Habitat Offset Plan (Volume 4, Part G – Section 22.0: Appendix 5.1-B). Extension of the lower segment WC 2 will collect surface flow diverted through loss of the upper segment and will increase the wetted area within the extension and the lower segment of WC 2.
M-5.1-06	Develop and implement an Erosion and Sediment Control Plan (See Volume 4, Part G – Section 22.0: Appendix 3).
M-5.5-01	Proposed Project design elements, including: ■ During aggregate mining operations, runoff from within the active mining area will be directed to the pit. The proposed pit has been designed such that all runoff would be retained within the pit without a discharge of surface flows. Water accumulating within the pit area during storm events would infiltrate into the pit wall and be filtered naturally through the native granular soils. ■ The potential for sediment laden runoff from the conveyor system would be managed by directing runoff either to the pit or the process area storm water management system. Conveyor crossing of any watercourses will be designed and constructed to prevent runoff being discharged to watercourses. ■ Drainage works surrounding the pit will be constructed such that clean runoff originating in areas unaffected by the Proposed Project will be directed around the active mining area. ■ The processing of aggregate involves crushing, screening, washing and stockpiling material. The fines generated by these activities will be extracted from the wash water and compressed into sediment cakes. The dried sediment cakes will be stored in a covered on-site containment facility and re-used for progressive reclamation. ■ Areas progressively reclaimed during the operational phase will be re-vegetated to control erosion.
M-5.5-03	Material Storage, Handling and Waste Management Plan (Volume 3, Part E – Section 16.0)
M-5.5-04	Site specific Spill Prevention and Emergency Response Plan (Volume 3, Part E – Section 16.0)
Ground Water Resources	
M-5.6-01	Limit excavation to the southern portion of the delta/fan.
M-5.6-02	Implementation of a progressive Reclamation Plan (Volume 4, Part G - Section 22.0: Appendix 3).
M-5.6-03	Set overflow structure at 5.2m.
M-5.6-04	Fines deposited around the northern and eastern perimeter of the property but each year's deposition will be limited to small surface area. Fines will be mixed with a growing medium and seeded.

Proposed Mitigation	
No.	**Description**
Air Quality	
M-5.7-01	Develop and implement an Air Quality and Dust Control Management Plan (Volume 3, Part E - Section 16.0) that will detail measures to control fugitive particulates (e.g., watering and speed controls).
M-5.7-02	Establish and on-site Air Quality and Meteorology Monitoring Program.
M-5.7-04	Processing plant crushing units will be partially enclosed.
M-5.7-05	Watering of 10 mm crushed gravel and 20 mm crushed gravel stockpiles.
M-5.7-06	Processing plant dry screening units will be partially enclosed.
M-5.7-07	Processing plant wet screening process.
M-5.7-08	Material handling will be partially enclosed with or without water (mist) spray.
Climate Change	
M-5.8-01	Major extraction and processing equipment such as the dredger, screens and crusher will be powered by electricity. Extracted and processed material will be transferred around the Project site using a network of electricity-powered conveyors instead of using haul vehicles.
M-5.8-02	Ongoing routine maintenance of vehicles.
M-5.8-03	Minimize idling of vehicles and tugs
ECONOMIC	
Sustainable Economy	
M-5.7-01 to M-5.7-08	Measures outlined in Section 5.7 Air Quality.
M-6.1-01	Local hiring and procurement policies and practices.
M-6.1-02	Explore electricity distribution infrastructure and apply for a suitable interconnection to the BC Hydro 138 kV transmission line in order to potentially offer access to BC Hydro electricity service to McNab Creek Strata real estate owners. If this electricity service is realized for strata owners then reliance on generators would be diminished along with their associated noise and air emissions.
M-6.1-03	Implementation of an Access Management Plan to provide special access to certain parts of BURNCO's private property pursuant to discussions between BURNCO and strata residents on access arrangements.
M-6.1-04	Ongoing engagement with McNab Creek Strata residents regarding issues of benefit and concern.
M-7.4-01 to M-7.4-10	Measures outlined in Section 7.4 Visual Resources.
M-9.2-01 to M-9.2-09	Measures outlined in Section 9.2 Noise.
SOCIAL	
Social Conditions	
M-5.1-20	Develop and implement a Spill Prevention and Emergency Response Plan (Volume 3, Part E - Section 16.0).
M-6.1-01	Local hiring and procurement policies and practices. Local hiring of workforce will assist in reducing in-migration and out-migration, and associated effects on housing.
M-7.1-02	Develop and implement an Emergency Response Plan (Volume 3, Part E Section 16.0).
M-7.1-03	Develop and implement an Access Management Plan (Volume 3, Part E Section 16.0).

Proposed Mitigation	
No.	**Description**
M-7.1-04	Aggregate transport by an experienced barge and tug operator that implements an Environmental Management System (EMS) in conformance with ISO 14001:2004.
Marine Transportation	
M-7.2-01	Consult with CCG, PPA, HPP, BC Ferries and Squamish Terminals along with other stakeholders regarding potential interference to identify operating practices or vessel route options that should be adopted.
M-7.2-02	Investigate further passage routing options to avoid busy recreational waters and BC Ferries routes particularly during the summer months.
M-7.2-03	Marine transportation management plan will include a procedure for marine stakeholders to consult with the proponent regarding special events such as, yacht races, regattas and marine based festivals.
M-7.2-04	Limit the number of water taxi movements traversing through Thornbrough Channel and to avoid peak recreational boating times, where possible.
M-7.2-05	Marine transportation management plan.
M-7.2-06	Project marine control zone will be marked using buoys subject to TC requirements.
M-7.2-07	Project-related infrastructure will incorporate recommendations of the Navigation Protection Program review process.
M-7.2-08	Dark sky shielded features will be installed in the Project area, where technically possible.
M-7.2-09	Relevant authorities will be notified so that Notices to Mariners and Notices to Shipping can be issued.
M-7.2-10	CHS navigational charts and other appropriate nautical publications will be updated to show the terminal and other marine features, where appropriate.
Non-Traditional Land and Resource Use	
M-5.7-01 to M-5.7-08	Measures outlined in Section 5.7 Air Quality.
M-7.2-01 to M-7.2-10	Measures outlined in Section 7.2 Marine Transportation.
M-7.3-01	Barges will be loaded only on weekdays.
M-7.4-01 to M-7.4-10	Measures outlined in Section 7.4 Visual Resources.
M-9.2-01 to M-9.2-09	Measures outlined in Section 9.2 Noise.
Visual Resources	
M-7.4-01	Minimize removal of vegetation and topsoil to ensure that existing natural vegetation is retained and incorporated into site design.
M-7.4-02	Dust suppression techniques should be in place at all times during construction.
M-7.4-03	Keep the scale and size of infrastructure components and layout concentrated.
M-7.4-04	Any desired planting programs for vegetative screening of land-based structures should be considered as results will not be immediately effective.
M-7.4-05	Preserve the level of structure contrast of infrastructure components by re-finishing and maintaining external surfaces as required.
M-7.4-06	Maintain natural screening to decrease the visibility of extraction and processing activity.
M-7.4-07	Re-contour and re-vegetate throughout Operation if possible.
M-7.4-08	Planting of berms and temporary planting.

Proposed Mitigation	
No.	**Description**
M-7.4-09	Keep the height of stockpiles low to avoid their visibility above existing screening.
M-7.4-10	Negative lighting impacts can be mitigated by installing fixtures that reduce light 'spillage' beyond the direct area of illumination.
HERITAGE	
Heritage Resources	
M-8.1-01	Implement Heritage Resource Chance Find Management Plan (Part E, Section 16.0) that provides management recommendations for avoidance, systematic data recovery or monitoring, in the event that undetected heritage resources are encountered during project activities.
HEALTH	
Public Health	
M-5.7-01 to M-5.7-08	Measures outlined in Air Quality section.
M-9.1-01	Confirmation that a Health and Safety Plan for workers covers the mitigation of exposure of workers to dust and particulate matter.
Noise	
M-9.2-01	Limit construction activity to daytime hours.
M-9.2-02	Schedule significant noise-causing activities to reduce disruption to nearby residents.
M-9.2-03	Position heavy equipment muster points at least 500 m from any receptor.
M-9.2-04	Fit equipment with standard mufflers or silencers and keep in good working order.
M-9.2-05	Use acoustical screening from existing on-site barriers.
M-9.2-06	Construct a McNab Creek Flood Protection Dyke, approximately 830 m long and 5 m high on the north side of the aggregate pit.
M-9.2-07	Construct a Pit Lake Containment Berm, approximately 800 m long and 9 m high on the south side of the aggregate pit.
M-9.2-08	Construct a Processing Area Dirt Berm, approximately 230 m and 9 m high on the east side of the processing plant.
M-9.2-09	Dry screens and crusher in the processing plant will be housed in fabric enclosures.

■ Fisheries and Freshwater Habitat

Early in the Proposed Project, Fisheries and Oceans Canada (DFO) expressed concerns about the Proposed Project's potential effect on fish and fish habitat as a result of the removal/infilling of the upper segment of WC 2. These concerns have been addressed as follows:

1) **"The proposed works will negatively impact fish habitat, consistent with the original High Risk ranking for the project. The extent of the impact is likely significantly greater than currently presented by BURNCO"**

BURNCO undertook several studies to understand the potential effects related to the Proposed Project on fish and fish habitat, this includes a mass-balance water quality model, hydrogeological model and a hydrodynamic model of the pit lake. Details regarding these models are provided in Volume 4, Part G – Section 22.0:

Appendix 5.5-B, 5.5-D, and 5.6-D. The outcome of these models were used to assess the potential Project-related effects to fish and fish habitat which is provided in Volume 2, Part B – Section 5.1: Fisheries and Freshwater Habitat assessment.

2) "The assessments conducted to date [i.e., late 2010] by the Proponent are not sufficient to completely characterize all of the impacts to fish and fish habitat"

The models described above were completed to satisfy this concern. Additional Proposed Project design elements were used to avoid and reduce the potential effects to fish and fish habitat. These are described in Volume 2, Part B – Section 5.1.

3) "Risks of avulsion for McNab Creek, saltwater intrusion, and to marine mammals – DFO acknowledges these are less than originally anticipated"

An assessment of avulsion risk was conducted and is described in Volume 4, Part G – Section 22.0: Appendix 5.4-A. The potential for saltwater intrusion is considered in the surface water effects assessment and the hydrogeological model (Volume 2, Part B – Section 5.5 and Volume 4, Part G – Section 22.0: Appendix 5.6-D). Potential Project related effects on marine mammals is described in Volume 2, Part B – Section 5.2.

4) "Options for adequate fish habitat compensation within McNab Creek or greater Howe Sound are severely limited and may not allow the proposed development to meet DFO's fish habitat policy objectives, including "No Net Loss" guiding principles"

A Fish Habitat Offset Plan is provided in Volume 4, Part G – Section 22.0: Appendix 5.1-B. The plan was designed to offset the loss of habitat at a high ratio (i.e., more habitat created than will be lost).

5) "The pit design detail and water/wastewater management plan require further development"

Pit design details and the use and recycling of water for the Proposed Project is described above in Section 2.5.1. An Erosion and Sediment Control Plan is provided in Volume 4, Part G – Section 22.0: Appendix 3.

In addition to these general concerns outlined by DFO, five specific areas of interest have been identified by BURNCO. Table 1-3 summarizes these areas of interest and how they are addressed.

Table 1-3: Summary of Areas of Interest Related to Fish and Fish Habitat

Area of Interest	Summary	EAC Application /EIS Reference
1. Harlequin Creek	There are no proposed works in or drainages to Harlequin Creek. No flow changes to the creek are predicted.	Volume 2, Part B – Section 5.1
2. The freshwater inlets along the foreshore	There are no proposed works in these watercourses. A slight increase in flow is predicted to these watercourses.	Volume 2, Part B – Section 5.1 and Volume 2, Part B – Section 5.5
3. The upper and lower portions of the groundwater-fed watercourse (WC 2)	Removal of the upper segment of WC 2 will result in habitat loss. Reductions in flow in the lower segment of WC 2 will result in a decrease in wetted area which will be offset by a proposed new groundwater-fed channel extension.	Volume 2, Part B – Section 5.1 and Volume 4, Part G – Section 22.0: Appendix 5.1-B

Area of Interest	Summary	EAC Application /EIS Reference
4. Low flow conditions of McNab Creek	Baseflows in McNab Creek are predicted to remain above baseline conditions during operations and after reclamation and closure.	Volume 2, Part B – Section 5.5
5. Water management along the western slopes of the property	There are no proposed works in the watercourses around the western slope of the property. No potential effects to surface water were identified. How water will be managed at the site is described above in Section 2.5.1 and in the other section referenced in column 3 of this table.	Volume 2, Part B – Section 5.5 Volume 2, Part B – Section 5.6

The Proposed Project will not lead to a reduction in the quantity or quality of fish habitat. The Fisheries and Freshwater Habitat assessment included design and analysis to support a habitat offsetting program (extension of the lower segment of WC 2) to achieve no harm to fish or fish habitat. The loss of the riparian and instream habitat associated with the upper segment of WC 2 will be adequately offset by the extension of the lower segment of WC 2 (Figure 8). The extension is predicted to lead to an increase in both instream and riparian habitat for anadromous salmonids and resident Cutthroat Trout.

- The majority of the Proposed Project-related residual effects can be mitigated through planning and implementation of known and effective mitigation measures, including a comprehensive Environmental Management Programme involving:
- Construction and Operational Management Plans (CEMPS and OEMPs);
- Fisheries Habitat Protection and Mitigation Plan;
- Spill Prevention and Emergency Response Plans (SPERP);
- Erosion and Sediment Control Plan (ESCP); and
- Fish Habitat Offset Plan.

- All potential Project-related residual adverse effects were determined to be negligible. No residual effects were carried forward to a cumulative effects assessment.
- A detailed assessment of potential fisheries and freshwater habitat effects of the Proposed Project is presented in Section 5.1 of the EAC Application/EIS.

Marine Resources

The Proposed Project is not anticipated to lead to a reduction in the quality of marine habitat. Any habitat lost as a result of in-water structures will be limited to piles and will be offset as detailed in the Fish Habitat Offset Plan. In addition, the majority of the marine related effects are expected to be confined to intertidal and subtidal areas that have previously been impacted by log dumping activities and is considered to be of low habitat value. Potential injury effects on marine mammals and fish related to underwater noise will be effectively mitigated through the

implementation of monitoring programs during pile driving activities in accordance with a Pile Driving Management Plan.

The majority of the Proposed Project-related residual effects can be mitigated through planning and implementation of known and effective mitigation measures, including:

- Construction and Operational Management Plans (CEMPS and OEMPs);
- Spill Prevention and Emergency Response Plans (SPERP);
- Erosion and Sediment Control Plan (ESCP); and
- Fish Habitat Offset Plan.

All potential residual effects on marine resources were predicted to be negligible or not significant given the magnitude, ecological context and likelihood of occurrence.

Potential cumulative effects of marine mammal disturbance from underwater noise were assessed and determined to not significant.

- A detailed assessment of potential marine resource effects of the Proposed Project is presented in Section 5.2 of the EAC Application/EIS.

Terrestrial Wildlife

Potential Project-related effects on amphibians, northern goshawk, marbled murrelet, band-tailed pigeon, western screech-owl, common nighthawks, Roosevelt elk and grizzly bears were assessed.

The Proposed Project will remove potential breeding habitat for amphibians. Compensation habitat, as detailed in the Fish Habitat Offset Plan, as well as the addition of the pit lake at closure, is expected to offset the loss of habitat. Amphibian salvaging will further reduce the potential for Project-related effects of mortality.

The Proposed Project is not predicted to result in the loss of northern goshawk or suitable marbled murrelet nesting habitat. After reclamation, northern goshawk and marbled murrelet are predicted to recover from disturbance effects experienced during construction and operational phases.

Construction of the Proposed Project will result in the loss of suitable band-tailed pigeon nesting and foraging habitat. It will not contribute to the loss of mineral sites or the proliferation of disease. Progressive reclamation will replace band-tailed pigeon foraging habitat as the Proposed Project proceeds.

The Proposed Project will remove mature forest habitat that may contain suitable nesting trees for western screech-owl. To mitigate this loss of habitat, the installation of nest boxes is proposed. After reclamation, western screech-owl are predicted to recover from disturbance effects experienced during construction and operational phases.

The Proposed Project will require removal of less than 0.1% of potential nesting habitat for common nighthawks in the region. After reclamation, common nighthawk populations are predicted to recover from disturbance effects experienced during construction and operational phases.

Project noise will affect approximately 3% of suitable Roosevelt elk winter habitat within the region and < 1% of suitable habitat will be lost due to clearing. Well planned and executed reclamation of the Proposed Project area will support restoration of suitable Roosevelt elk winter range habitat. After reclamation, Roosevelt elk populations are predicted to recover from disturbance effects experienced during construction and operational phases.

The Proposed Project area falls within the range of the Squamish-Lillooet Grizzly Bear Population Unit. Grizzly bear have not been recorded in the Proposed Project area over three years of survey data collection. They may occasionally move through the area or forage in McNab Creek. Potential effects of habitat loss and mortality during construction and operations were assessed. As grizzly bears are not expected to occur within the Proposed Project area, the Proposed Project is not predicted to contribute to the potential mortality of the species. After mitigation, the adverse effects of the Proposed Project are not likely to contribute to factors limiting the population and are therefore determined to be not significant. During reclamation and closure, wildlife habitat will return to at least a capability equivalent to baseline conditions.

The majority of the Project-related effects can be mitigated through Project planning, including:

- Construction and Operational Management Plans (CEMPS and OEMPs);
- Spill Prevention and Emergency Response Plans (SPERP);
- Erosion and Sediment Control Plan (ESCP);
- habitat enhancement for western screech-owl through the installation of nest boxes; and
- progressive reclamation and habitat compensation during Operation and Reclamation and Closure.

Net potential residual effects on terrestrial wildlife were determined to be negligible to not significant. Cumulative residual effects on amphibian species at risk, western screech-owl, and Roosevelt elk were assessed and determined to be not significant. Since the Squamish-Lillooet GBPU is considered threatened, the net cumulative residual effects to grizzly bear was determined to be significant. The development of new logging roads may increase vehicle collisions. Since grizzly bears are not expected to occur within the Proposed Project area, the Proposed Project is not predicted to contribute to the potential mortality of the species.

- A detailed assessment of potential terrestrial wildlife effects of the Proposed Project is presented in Section 5.3 of the EAC Application/EIS.

Terrestrial Vegetation

The Proposed Project will result in the temporary loss of 0.7 ha of riparian ecosystem and 0.88 ha of wetland ecosystem during the construction and operation of the Proposed Project, plus the time required for re-establishment post-reclamation. Re-establishment to current conditions is expected to occur within 150 years.

Post-closure, a positive net effect to the sensitive ecosystems is predicted to result from the creation of 3.3 ha of new riparian area around the pit lake.

The key residual effect to terrestrial vegetation associated with the Proposed Project is the permanent loss of 23.7 ha of the blue-listed Western hemlock – Amabilis fir – Deer fern upland forest, and 0.2 ha of the provincially red-listed Sitka spruce – Salmonberry high fluvial bench forest due in the area of the proposed aggregate pit. The severity of this effect is mitigated by the Project design, which is sited entirely within areas previously disturbed by forest harvesting and other anthropogenic disturbance.

The Proposed Project will also result in the temporary loss of 20.6 ha of Western hemlock – Amabilis fir – Deer fern upland forest, 0.8 ha of Western red cedar – Sitka spruce – Skunk cabbage swamp forest, 0.3 ha of Sitka spruce – Pacific crab apple riparian forest, 0.08 ha of Tufted hair grass – Douglas' aster estuarine meadow, and 0.4 ha of Sitka spruce – Salmonberry high fluvial bench forest. The significance of this effect was determined to be not significant.

The potential risk for the introduction of deleterious substances will be controlled with the preparation of Construction and Operational Management Plans (CEMPS and OEMPs), on-site environmental monitoring, and scheduled equipment inspections and maintenance. These measures will reduce the likelihood of an accident or malfunction that would result in a spill. A Spill Prevention and Emergency Response Plan will also be prepared and implemented. It is expected that mitigation will reduce the likelihood of this occurrence to low; therefore, the significance rating of this effect is negligible.

- All remaining potential terrestrial vegetation effects (i.e., increased dust, surface runoff, invasive species, windthrow, and soil disturbance) considered in this assessment were determined to be negligible with the application of appropriate mitigation.
- Net potential cumulative effects on terrestrial vegetation was determined to be not significant.
- A detailed assessment of potential terrestrial vegetation effects of the Proposed Project is presented in Section 5.3 of the EAC Application/EIS.

Geotechnical Hazards

Although altering subsurface conditions could lead to rapid loss of soil strength resulting in amplified liquefaction, ground settlement or lateral shifts, potential detrimental changes to subsurface and stability conditions can be minimized or mitigated by appropriate design and construction measures. With the implementation of mitigation, potential residual effects related to increased ground movement during earthquake event (liquefaction, settlement, lateral movement, rupture) were determined to be negligible.

Although altering subsurface conditions could impact the volume of erodible shoreline soils during an earthquake or landslide initiated tsunami-related event and result in increased sedimentation of the marine environment, these potential effects can also be addressed through appropriate design and construction.

During earthquake events, slumping and instability of the steep fan-delta front submarine slopes may occur. However, under static loading conditions, submarine slopes are assumed to be stable. Geotechnical and

geophysical subsurface investigations, engineered designs, and construction monitoring will be conducted where static loading conditions may be affected. Mitigation includes design of facility and structures to be built to specified building code for design level earthquakes with 1:2,475 to more than 1:5,000 year return periods. With the implementation of mitigation, potential residual effects related to Proposed Project-related initiation of Submarine Landslides were considered negligible.

- A detailed assessment of potential geotechnical and natural hazard effects of the Proposed Project is presented in Section 5.4 of the EAC Application/EIS.

Terrain Stability

No terrain stability concerns have been identified within the Proposed Project area. Proposed Project activities are not expected to induce land based mass wasting events such as landslides, snow avalanches, and debris flows and debris floods. Although geologic phenomena such as landslides, steep valley sidewall debris and rock slides and snow avalanches are common in the McNab Creek watershed, they are not expected to directly affect the Proposed Project area. The Proposed Project will increase the potential for initiating mass movement processes (landslides and snow avalanches).

It is unlikely that there is a significant potential for debris flows and debris floods to occur upstream of the Proposed Project area. Further investigation and assessment will be required to inform detailed engineering designs prior to construction. All potential terrain stability effects were determined to be negligible.

- A detailed assessment of potential geotechnical and natural hazard effects of the Proposed Project is presented in Section 5.4 of the EAC Application/EIS.

Surface Water Resources

The Proposed Project was predicted to have positive effects on the flows in McNab Creek by reducing the rate of flow loss to the groundwater system in the segment of McNab Creek adjacent to the proposed aggregate pit. Increase baseflows are also predicted in the foreshore minor streams.

During operations, the analysis indicates that the baseflow in WC 2 will be reduced in the range of 19% and 37% compared to pre-Proposed Project conditions. Despite the reductions in baseflow, other hydrologically significant variables including total wetted surface area and average flow depth of WC 2 are expected to increase with the implementation of proposed mitigation. Potential effects related to reductions in surface water flows are related to the most sensitive receiver in WC 2 identified as fish and fish habitat. All potential Project-related residual adverse effects on fish and fish habitat were determined to be negligible.

Potential effects on water quality related to suspended sediments and chemical spills were assessed. Throughout the life of the Proposed Project, measures are proposed to reduce the potential for sediment erosion, transport and deposition into any stream or watercourse and spills. Potential effect surface water quality were determined to be negligible with the development and implementation of effective control measures, including:

- Construction and Operational Management Plans (CEMPS and OEMPs);

- Spill Prevention and Emergency Response Plans (SPERP);
- Material Storage, Handling and Waste Management Plans (MSHWMPs);
- Erosion and Sediment Control Plan (ESCP); and
- Best Management Practices.

- A detailed assessment of potential surface water resource effects of the Proposed Project is presented in Section 5.5 of the EAC Application/EIS.

Aquatic Health

Potential effects assessed for aquatic health indicators (i.e., periphyton, benthic invertebrate communities and fish populations) included direct toxicity and nutrient enrichment related to changes in water quality. The aquatic health residual effects assessment used water quality predictions modelled for several locations within the receiving environment. These predictions were compared to water quality guidelines (WQG) for the protection of aquatic life. Most predictions were below applicable WQGs or were not distinguishable from baseline conditions. Predicted water quality concentrations without WQGs that were above baseline conditions were not expected to result in adverse effects on aquatic indicators. The magnitude of direct toxicity and nutrient enrichment-related effects on aquatic health is expected to be negligible. With the implementation of mitigation (e.g., surface water quality monitoring program, monitoring of periphyton biomass, and monitoring of benthic communities) all potential residual effects related to aquatic health were determined to be negligible. No residual effects on aquatic health were carried forward to a cumulative effects assessment.

- A detailed assessment of potential surface water resource effects of the Proposed Project is presented in Section 5.5 of the EAC Application/EIS.

Groundwater Resources

Potential effects of the Proposed Project on groundwater flow and groundwater quality were assessed.

A three-dimensional numerical hydrological model was developed to assess potential effects on groundwater flow/quantities. Although groundwater flow is predicted to be less than the baseline during the first 15 years of operation, reduced groundwater loss from McNab Creek are predicted to result in an overall benefit to the environment. In the last year of operations and through to reclamation and closure, groundwater flow is expected to increase by 2% from the baseline condition.

A mass-balance water quality model was developed to assess potential effects on groundwater quality, which were determined to be negligible; no water quality parameters were predicted to exceed British Columbia Water Quality or Canadian (BCWQ) or Council of Ministers of the Environment (CCME) guidelines throughout operations and reclamation and closure.

Proposed mitigation includes limiting excavation to the southern portion of the delta/fan, developing and implementing a Reclamation and Effective Closure Plan, and setting the height of the overflow structure at closure at 5.2 m to maintain groundwater flow rate. Proposed mitigation is considered effective and incorporates adaptive management techniques that can be undertaken if monitoring data indicates a different balance between losses from McNab Creek, changes in groundwater flow rates and the water flow in down gradient aquatic habitat need to be achieved.

The assessment of significance of potential effects on groundwater flow and groundwater quality used an approach that was conservative in nature so that there is a high level of confidence that the Proposed Project-related effects have not been underestimated. No residual effects on groundwater were carried forward to a cumulative effects assessment.

- A detailed assessment of potential groundwater resource effects of the Proposed Project is presented in Section 5.6 of the EAC Application/EIS.

Air Quality

Potential effects of the Proposed Project on air quality indicators were assessed. Proposed mitigation such as enclosing material drop areas and mist sprays were incorporated into the air quality model. An Air Quality and Dust Control Management Plan will be developed that will detail control measures, such as watering and speed controls that must be in place to limit fugitive particulates.

Particulate matter concentrations (TSP, PM_{10} and $PM_{2.5}$) at the nearest receptor site where people live (less than 0.37 km from the facility's fence-line) were predicted to be below ambient air quality standards. Potential residual effects were determined to be not significant.

Predictions for NO_2 and SO_2 at sensitive receptors were determined to be negligible (i.e., less than 25% of the respective air quality objectives). One additional tugboat trip per operational day (300 days per calendar year) on existing barging routes was determined to result in an increase in SO_2 and NO_2 emission rates of less than 5% in the Lower Fraser Valley.

Potential cumulative residual effects of particulate emissions are predicted to be of negligible magnitude and fully reversible; these potential effects we therefore also determined to be negligible.

- A detailed assessment of potential air quality effects of the Proposed Project is presented in Section 5.7 of the EAC Application/EIS.

Climate Change

The consideration of climate change was carried out in accordance with the general guidance document for practitioners prepared by the Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment.

- The climate projections for the Proposed Project region were based on Pacific Climate Impacts Consortium (PCIC's) Regional Analysis tool. The future climate at the Proposed Project location was forecast to have higher temperatures and generally increased precipitation levels. Using the historical climate trends and the future climate projections, the effects of climate on the Proposed Project were analysed by developing a climate risk matrix to identifying potential climate infrastructure interactions. The effects of a potentially changing climate on the Proposed Project were determined to be not significant.

The direct and indirect Greenhouse Gas (GHG) emissions associated with the Proposed Project were quantified and compared to the current provincial, national sector and federal totals. The conservative estimate of Proposed Project GHG emissions is only 0.0082% of the BC emissions, 0.00072% of the total national emissions and 0.00001% of global emissions. The contribution of Proposed Project GHG emissions to the provincial and federal totals are considered negligible. Based on the calculation methodology for the Proposed Project GHG emissions, the confidence level is considered to be high. Therefore, the influence of the Proposed Project GHG emissions on totals was determined to be negligible.

The influence of the Proposed Project GHG emissions on climate change was assessed by determining whether any measurable change in climate could result from the Proposed Project GHG emissions. The relatively minor increase in global emissions associated with the Proposed Project would correspond to a change in climate that is unlikely to be measurable and was determined to be negligible. This conclusion is supported by federal guidance which indicates that "…unlike most project-related environmental effects, the contribution of an individual project to climate change cannot be measured," and the confidence level is considered to be high. Therefore, the influence of the Proposed Project GHG emissions on climate change was determined to be not significant.

Despite the negligible effect on climate change, the Proposed Project includes in-design mitigation measures that will reduce GHG emissions that are consistent with specific actions within the Sea-to-Sky Air Quality Management Plan (SSAQMP) (Sea to Sky Clean Air Society 2007).

- A detailed assessment of potential climate change effects of the Proposed Project is presented in Section 5.8 of the EAC Application/EIS.

Sustainable Economy

The Proposed Project would generate a total count of 119 jobs over the up to two year construction phase and an annual average of a total of 99 direct, indirect and induced jobs during the operations phase in BC. In general, the annual average figure can be viewed as the number of direct long-term jobs that would be generated through the operation of the new sand and gravel extraction and processing operation. An estimated total of the available 33 long-term jobs that are connected to the Proposed Project are expected to be filled by Sunshine Coast residents during its operation phase. Based on foreseen labour supply and capacity conditions, there is expected to be sufficient capacity within the Sunshine Coast Regional District (SCRD) labour force to meet BURNCO's hiring demand for labour during both construction and operation phases.

McNab Creek Strata is located to the east of McNab Creek, approximately half a kilometre from the northern boundary of the BURNCO property. McNab Creek Strata is a bare land strata and includes 16 lots, as well as 22 ha of adjacent forested land on the hill to the east of McNab Creek and is water access. The marketplace values of McNab Creek Strata real estate may be adversely affected by the Proposed Project's construction and operations due to the change in land use on the Property and perceived and/or actual changes to the environmental setting. While it is anticipated that proposed mitigation will help offset Proposed Project effects on real estate values by adding features that will likely enhance their marketplace value (e.g., access to BC Hydro electricity service and elimination of the use of fossil fuel fired generators), it is not currently known if these measures will fully offset any potential adverse effect on real estate values. Potential effects to real estate were determined to be not significant and the Proponent is committed to ongoing engagement with the McNab Creek Strata residents regarding issues of benefit and concern.

The potential cumulative residual effects on real estate values were assessed. A driver for the cumulative effect assessment is the visual disturbance generated through forestry activities. The assessment concluded that potential cumulative effects on real estate were not significant since there were no predicted cumulative effects on noise or air quality, and visual disturbances through forestry activities (that are managed for visual quality objectives on Crown lands) are a longstanding effect in the region.

- A detailed assessment of potential economic effects of the Proposed Project is presented in Section 6.1 of the EAC Application/EIS.

Social Conditions

Proposed Project construction and operations is expected to result in a negligible population change in the SCRD or the Town of Gibsons and Electoral Area F. No increase in demand on the housing and commercial accommodation market is anticipated.

BURNCO will provide a water taxi service from the SCRD for its workers during construction and operations. It is anticipated that most workers will be hired either from the Town of Gibsons, other nearby communities and/or the greater Vancouver area, and will commute daily to the water taxi pickup points. During construction, workers whose permanent residence is not in close proximity to the Proposed Project may decide to relocate to Gibsons or the Greater Vancouver area, using either rental accommodation or shorter-term arrangements such as hotels and

motels. However, the proportion of workers making such arrangements would not be large enough to affect the local rental and recreational accommodation market.

A small number of operational workers who may not be from the area may relocate permanently to the Town of Gibsons or surrounding area, but the associated population effect and effect on the housing market would be small compared to the larger economic forces driving the housing market in the SCRD, such as retirement and demand for recreational properties. With proposed mitigation measures in place, Proposed Project effects on housing and accommodation were determined to be negligible.

Construction and operations activities could also potentially generate a demand for emergency services due to on-site emergencies, changes in population associated with in-migration of workers, and increased vessel traffic. To mitigate potential Proposed Project use of local emergency services, BURNCO will establish and implement an Emergency Response Plan (ERP) and provide all emergency response services at the Proposed Project site.

Population changes resulting from the Proposed Project are also not anticipated to increase the need for community-based emergency services. Larger vessel traffic through Howe Sound generated by the Proposed Project represents an increase of less than 3% during operations, and it is not expected to affect marine based emergency services. With proposed mitigation measures in place, Proposed Project effects on emergency services were determined to be negligible.

- A detailed assessment of potential social effects of the Proposed Project is presented in Section 7.1 of the EAC Application/EIS.

Marine Transportation

Effects considered in the marine transportation assessment included those related to wake effects from the Proposed Project-related vessel traffic on shoreline infrastructure, and interference with navigation use and navigability due to Proposed Project-related infrastructure and vessel traffic.

The maximum calculated wake energy associated with Project vessels was typically less than wind wave energy; wake wash energy from tug and barge movements is anticipated to be less than 1% when compared to the total energy from naturally occurring wind waves along both vessel routes. There is no potential interaction between potential wake effects and shoreline infrastructure, therefore the nature of this interaction was determined to be negligible.

The potential effects of the Proposed Project on navigation use and navigability associated with Project-related infrastructure was determined to be negligible following the implementation of proposed mitigation. Potential effects of the Proposed Project on navigation use and navigability due to Project associated vessel traffic during construction and operations was determined to be not significant as the frequency of small vessels changing direction and speed to move out of the paths of larger vessels is expected to increase only slightly.

Proposed Project-related barging may interact with Woodfibre LNG carriers along a small section of the Project's barging route. However, interactions between vessels associated with each project will occur intermittently when these vessels are simultaneously present in Collingwood Channel. Potential cumulative residual effects are expected to be not significant following implementation of mitigation measures.

- A detailed assessment of potential marine transportation effects of the Proposed Project is presented in Section 7.2 of the EAC Application/EIS.

Non-Traditional Land and Resource Use

The Proposed Project is occurring on private property owned by BURNCO that has allowed access into and through the Property for the purposes of forestry and industrial development and will continue to do so during construction and operation. As a result, no negative effects on forestry, mining or industrial development were identified.

Coastal Inlet Adventures, the guide outfitter with a tenure that overlaps the Proposed Project area, has the ability to access Crown lands via forestry roads in the north using a landing craft capable of carrying ATVs. Access via forestry roads from Salmon Inlet would not be restricted by the Proposed Project.

The eastern side of the Proposed Project area (outside of the Property), both in the marine waters and below the high tide mark on the beach near the mouth of McNab Creek is considered to have higher recreational use activity than the jetty area on the other side of the Property. During construction and operation, this area would remain available for public use, so no displacement of recreation due to the Proposed Project is expected in this area.

On an intermittent basis, the vessels and other watercraft of recreational marine-users are anticipated to have to make minor alterations in direction and/or speed when navigating at the same time as Project associated water taxis and barges. These temporary displacement effects due to the Proposed Project were determined to be negligible.

Potential adverse effects to the quality of the environmental setting of recreational marine harvesting and tourism activities are anticipated to result from changes in noise levels, air quality and visual quality. Measures proposed to address these key nuisance concerns also mitigate the potential effects on the quality of the environmental setting. As a result, the potential residual adverse effects were determined to be not significant; further, recreational and tourism activities are not expected to be displaced and the effect is expected to be limited to the life of the Proposed Project.

Potential cumulative effects on the quality of the environmental setting for recreational harvesting of fish and shellfish and tourism were assessed. A driver for the cumulative effect assessment is the visual disturbance of ongoing forestry activities. The assessment concluded that potential cumulative residual effects on recreational harvesting of fish and shellfish and tourism were not significant since no cumulative effects on noise or air quality are anticipated, and visual disturbances of forestry activities (that are managed for visual quality objectives on Crown lands) are a longstanding effect in the region.

- A detailed assessment of potential non-traditional land and resource effects of the Proposed Project is presented in Section 7.3 of the EAC Application/EIS.

Visual Resources

The Proposed Project is anticipated to be partially visible, with effects limited mostly to portions of marine and ancillary facilities and activities related to marine loading and lighting. There is the potential for adverse effects on visual quality since the Proposed Project components and activities related to construction and operation will present visible anthropogenic features to the existing landscape setting.

Following the application of proposed mitigation measures, the residual effects are predicted to present a relatively small level of visual change to the landscape with effects diminishing with increasing viewing distance from the Proposed Project site. Residents of McNab Creek Strata and recreational marine users in Thornbrough Channel are likely to be most affected, however potential residual effects were determined to be not significant.

The removal of land-based and marine infrastructure and site reclamation during the reclamation and closure phase are expected to reduce residual visual effects related to construction and operation phases of the Proposed Project and will rehabilitate the existing exposed area of the site to a more natural visual condition. There is the potential to provide positive social and recreational effects related to an increase in scenic character of the Proposed Project site following closure.

The residual cumulative effects are predicted to present a regional, medium-term and moderate level of visual change to the landscape related to the residual visual effects of the Proposed Project contributing to residual visual effects with other certain or foreseeable developments including forestry activity and development of a run-of-river hydroelectric project. Within a context that demonstrates visible disturbance from past and current activities and has a high sensitivity to adverse visual change, the residual effects of the Proposed Project and the residual cumulative effects were not predicted to demonstrate an evident contrast with the current landscape character or to produce a noticeable decline in the current level of visual quality.

- A detailed assessment of potential visual resource effects of the Proposed Project is presented in Section 7.4 of the EAC Application/EIS.

Heritage Resources

- No heritage resources were observed or identified in the Proposed Project area. Two areas of archaeological potential were identified; twenty-eight shovel tests were excavated, with negative results. Palaeontological desktop studies resulted in the development of palaeontological sensitivity ratings. Areas of high palaeontological sensitivity are noted within the Proposed Project area.

The significance of residual effects to heritage resources during the Proposed Project were determined to be not significant. While archaeological field studies have been completed and no archaeological sites were recorded, the Proposed Project are does retain potential to contain buried archaeological materials. If heritage resources are encountered during operations, potential effects mitigation would be mitigated through the development and implementation of a Heritage Resource Chance Find Management Plan.

Heritage resources within the region could be negatively impacted through wave-generated erosion causing a change to the integrity and to the context of the resources. Heritage resources within the region could also be negatively impacted in the event of a spill during operations resulting in a change in the integrity of the resource,

causing a change to the integrity and to the context of the resources. Should a future spill occur resulting in potential impacts to inter-tidal or sub-tidal areas where heritage resources may be present, it is recommended that an appropriate management strategy be developed in consultation with the Archaeology Branch, the *Sḵwx̱wú7mesh* (Squamish) First Nation, and the Tsleil-Waututh Nation.

Cumulative residual effects on heritage resources could result from erosion of intertidal and near shore areas in combination with impacts as a result of log-dumping activities. All potential cumulative effects related to changes to heritage resource integrity, context and accessibility (if present) were assessed as not significant.

- A detailed assessment of potential heritage resource effects of the Proposed Project is presented in Section 8.1 of the EAC Application/EIS.

Public Health

- Potential effects on human health assessed included Proposed Project activities contributing to emissions of constituents to air, and to deposition of particulate matter to terrestrial environments and emission of substances to aquatic environments. Since potential VCs and pathways do not have significant residual effects for each chemical of potential concern (COPC), it is considered unlikely that the Proposed Project will have a significant effect on human health. All potential effects related to human health were determined to be negligible or not significant.

It was not possible to conduct a quantitative cumulative effects assessment for human health, as there is insufficient information available to conduct water and air quality modelling of other certain and reasonably foreseeable projects and activities.

- A detailed assessment of potential public health effects of the Proposed Project is presented in Section 9.1 of the EAC Application/EIS.

Noise

Noise from Proposed Project construction and operations has been assessed in accordance with the Commission Guideline and Health Canada Guidance. In particular, Proposed Project construction and operation noise levels were predicted using computer noise models for eight construction phases and three operation scenarios. The cumulative noise levels were calculated and compared to relevant assessment criteria – i.e., the Commission Guideline Permissible Sound Levels (PSL), the Directive 038 Low Frequency Noise (LFN) threshold, and the Health Canada Guidance change in High Annoyance (%HA) and speech intelligibility metrics.

The important conclusions of the noise assessment are:

- The residual effect of the Proposed Project construction to the acoustic environment, as characterized via the noise levels VC, is found to be negligible and there is no significance to the effect;
- The residual effect of the Proposed Project operation to the acoustic environment, as characterized via the noise levels VC, is found to be negligible and there is no significance to the effect; and

- The residual effect of the Proposed Project reclamation and closure to the acoustic environment, as characterized via the noise levels VC, is found to be negligible and there is no significance to the effect.

The Sunshine Coast Regional District noise bylaw has also been considered in this assessment. As the magnitude of the Commission Guideline and HC Guidance assessments of the Proposed Project operations were negligible, the nuisance-based bylaw should be satisfied.

- A detailed assessment of potential noise effects of the Proposed Project is presented in Section 9.2 of the EAC Application/EIS.

Effects on Aboriginal Rights, including Current Use

Information on the Aboriginal Groups identified by BC EAO and the CEA Agency was compiled through consultation with the Aboriginal Groups and from publicly available sources. This information was used to document use by S*kwxwú7mesh* Nation and by Tsleil-Waututh Nation, Musqueam Indian Band, Stz'uminus First Nation, Cowichan Tribes, Lyackson First Nation, Penelakut Tribe and Métis Nation British Columbia. This information formed the basis of the effects assessment on Aboriginal Rights, including current use, as a result of the Proposed Project.

Consultation activities during the Pre-Application stage focused mainly on the Aboriginal Groups listed in the Section 11 Order (Schedule B): *Skwxwú7mesh* Nation and Tsleil-Waututh Nation. Consultation with these Aboriginal Groups will continue throughout the Application Review stage and post-certification.

Potential effects on Aboriginal Rights, including current use, as a result of Proposed Project activities were identified for the S*kwxwú7mesh* Nation and the Tsleil-Waututh Nation. Following implementation of the recommended mitigation measures for S*kwxwú7mesh* Nation Aboriginal Rights and for Tsleil-Waututh Nation Aboriginal Rights, residual effects will remain. In the case of S*kwxwú7mesh* Nation Aboriginal Rights, the measurable residual effects following mitigation are considered not significant. No measurable residual effects are expected on Tsleil-Waututh Aboriginal Rights, including current use, following mitigation. The results of the effects assessment on Aboriginal Rights, including current use, are summarized in Section 14 of the EAC Application/EIS.

For S*kwxwú7mesh* Nation, the conclusion of "acceptable impacts" is contingent on the mitigation documented, most of which requires further implementation and/or deep consultation with S*kwxwú7mesh* Nation. It is also limited to the Proposed Project as defined: the size of operations and relatively short lifespan of the Proposed Project are very important considerations. Consequently, the conclusion of non-significant residual effects is presented with moderate confidence. Due to this uncertainty, S*kwxwú7mesh* Nation has reserved the right to revise this conclusion should new and important information be revealed, or should the Proposed Project details change.

Consultation activities are also the recommended mitigation between the Proponent and Tsleil-Waututh Nation to address incremental effects on quality of experience from the Proposed Project on Tsleil-Waututh Nation Aboriginal Rights. Without further consultation and, potentially, accommodation of Tsleil-Waututh's Aboriginal Rights, the Proposed Project may have ongoing effects on quality of current use experience for Tsleil-Waututh users of the Proposed Project area.

Environmental Management Programme

An Environmental Management Programme is proposed to provide performance-based environmental requirements, standard protocols, and mitigation measures to avoid and reduce the potential for environmental effects throughout the Proposed Project. The development and implementation Construction and Operational Environmental Management Plans (CEMP and OEMP) will reduce the potential for adverse environmental effects. The CEMP would consist of the Management Plan and several site or activity-specific Environmental Protection Plans (EPPs) and EMP Component Plans. The CEMP for the Proposed Project provides performance-based environmental requirements to be met by Contractor(s) in conducting work in accordance with regulatory approvals, BMPs, Commitments and Assurances, and engineering specifications. Environmental management plans will be developed in consultation with relevant permitting agencies, local governments, the *Sḵwx̱wú7mesh* (Squamish) First Nation, and the Tsleil-Waututh Nation and will be considered living documents that can be adapted as necessary throughout the lifetime of the Proposed Project.

- Environment monitoring plans will be developed by qualified environmental professionals and implemented to achieve compliance with EA conditions and with terms and conditions of regulatory permits and approvals. Monitoring will consist of two main components: compliance monitoring and effects monitoring. BURNCO commits to providing the funding for these monitoring initiatives.
- Compliance monitoring will occur during all phases of the Proposed Project. Compliance monitoring will include assessment of Proponent and contractors' environmental performance using specifically developed performance indicators and benchmarks. Where possible, an adaptive management approach will be used to modify management plans as needed based on the results of the monitoring program. Monitoring programmes provide an opportunity for local community members and First Nations groups to be involved in the development and implementation of monitoring initiatives. This will be clearly defined within the final monitoring framework which will be developed for each of the areas described below.
- Effects monitoring will include periodic sampling or studies on/of groundwater, vegetation, wildlife, fish, air quality, surface water and aquatic health. Monitoring plans will establish timelines and schedule for each monitoring activity. Programmes may commence during construction, operations or reclamation phase of the Proposed Project. The schedule and length of the programme will be provided. Some additional monitoring programmes may be suggested after the Proposed Project has commenced. Adaptive management techniques will be applied to all monitoring programmes.

Effects Monitoring (Follow-up Programmes)

The sections below describe the effects monitoring and follow-up programmes that will be applied during the Proposed Project. This is in addition to the compliance monitoring that has been described above for construction and operations EMPs. Programmes may commence during construction, operations or reclamation phase of the Proposed Project. The schedule and length of the programme will be provided. Some additional monitoring programmes may be suggested after the Proposed Project has commenced. Adaptive management techniques will be applied to all monitoring programmes. Follow-up monitoring programmes will be developed for the following disciplines:

- **Groundwater** - Monitoring of the groundwater flow rates, hydraulic heads and quality will be completed during construction, operations and reclamation and closure. Adaptive management will be undertaken if necessary.
- **Vegetation** - Vegetation monitoring will include an assessment of windthrow as well as post-reclamation monitoring.
- **Wildlife** - Wildlife monitoring will include yearly monitoring of amphibians, birds and mammals within the LSA to track species presence, abundance and habitat use. A water quality monitoring program will be developed and implemented which includes monitoring temperature, pH and total suspended solids (at a minimum) in retained amphibian breeding locations.
- **Fish and Fish Habitat** - Monitoring plans will include clear objectives for monitoring the continued use of habitat by fish and the integrity of fish habitat. The plans will describe procedures for conducting community assessments of fish-bearing streams in the LSA with the objective of determining measurable changes to fish habitat structure and function. Monitoring plans will also describe the proposed use of flows from the pit lake outlet structure to maintain fish habitat within the proposed groundwater-fed channel extension (e.g., WC2 offset habitat). Habitat offset monitoring will be conducted to confirm that habitat offset measures outlined in the Habitat Offset Plan are implemented and to assess the functionality of the constructed offset habitat.
- **Air Quality** - Control of emissions during the construction phase will include the establishment of a continuous air quality and meteorological monitoring program. The program will be installed prior to the construction phase; this will allow data comparison between pre-construction and construction activities to better determine the impact of the construction activities.
- **Surface Water Quality** - The surface water quality monitoring program for the Proposed Project will include the collection of surface water samples for analytical chemistry and *in situ* measurements of water quality parameters.
- **Aquatic Resources** - Baseline monitoring of periphyton biomass will be undertaken in McNab Creek at stations MC-1 and MC-7 as well as a suitable location upstream of mine influence prior to construction. Algal biomass data will also be collected at MCF-6 and MCF-12 downstream of the pit lake under baseline conditions prior to construction of the fish offset habitat. These data will represent baseline data in a future biological monitoring program should a program be initiated.

Project Benefits

The Proposed Project would have a positive effect on the local and B.C. economy, increasing the demand for goods, services and labour and generating tax revenue for all levels of government. During construction, total expenditures on goods and services by BURNCO are expected to be $21.5 million. Total direct expenditures from the Proposed Project accruing to suppliers of B.C. produced goods and services would be approximately $8.3 million during construction, and approximately $13.0 million per year during operations. In total, there would be close to $170 million in direct spending on materials, goods and services produced in B.C.

Employment will include approximately 80 and 360 person-years of direct employment during construction and operations respectively. Household spending of the Proposed Project's direct and indirect labour would provide another goods and services supply opportunity for businesses. Induced output over the two-year construction phase is expected to be an estimated $1.9 million CDN in BC and about $0.8 million CDN locally. The average

annual induced output the Propose Project operations is anticipated to be $0.75 million CDN locally and $2.1 million CDN province-wide.

BURNCO plans to implement the measures to enhance economic benefits generated by the Proposed Project for local residents and businesses, including hiring policies and practices to support local employment and policies and practices to support local procurement.

The assessed value of the Property for 2014 totalled approximately $628,800, which reflects current use as a managed forest and property tax payments for 2014 totalled $6,319[1]. The payments of property taxes to the SCRD and the BC Government would be much higher for the Property as a result of the change in assessment class to light industry and the rise in assessed value based on the use for aggregate extraction and processing. From a local perspective, the Property is subject to electoral area tax, and defined service area taxes for regional planning, regional recreation, animal control and Sunshine Coast Hospital. In addition there would be property taxation by the BC Government for school and general purposes.

In addition to those economic benefits described above, other benefits or positive effects will include:

- Increased baseflows, increase in wetted area and average flow depth, and reductions in predicted dry periods (i.e., greater water availability for aquatic habitat) in McNab Creek during project operations;
- Increased flows, wetted area and average depth in the foreshore minor streams (WC3, WC3-E, WC4-E, and WC 4-W and WC5);
- Increased wetted area and average flow depth within the lower segment of WC 2;
- New amphibian breeding habitat within the lentic zone of the pit lake at closure; and
- Improved aesthetic qualities of the Property after closure would likely have a positive effect on nearby property use and value.

Conclusions

Federal and provincial EA reviews provide an integrated process for the evaluation, feedback and development of Proposed Projects by identifying and assessing potential adverse environmental, economic, social, heritage and health effects (i.e., five pillars), mitigation to avoid or reduce those effects through redesign and operational improvements, and the significance of the potential residual effects after mitigation. BURNCO is committed to avoiding, reducing or otherwise mitigating potential effects of the Proposed Project through design features, best management practices and other mitigation measures. The EAC Application/EIS provides technically and economically feasible mitigation measures which first avoid and second reduce potential adverse effects across each of the five pillars, assessed as valued components (VCs). VCs were assessed for all phases of the Proposed Project lifecycle (construction, operations, reclamation and closure), including Proposed Project activities, accidents and malfunctions and cumulative effects.

[1] The shown assessed value is the aggregated value for the four individual parcels and one foreshore tenure.

The conclusion of the assessment is that, with the application of design considerations and identified mitigation, no significant adverse effects will result from the Proposed Project.

- Net cumulative residual effects for grizzly bear were determined to be significant as they contribute to the factors limiting the population, which is likely sensitive to imposed stresses. However, the Proposed Project is unlikely to contribute to the factor limiting the grizzly bear population (i.e., mortality).

Potential effects on Aboriginal rights, including current use have been considered and assessed in Part C of the EAC Application/EIS. It is predicted that potential effects on Aboriginal rights, including current use, will be addressed by identified mitigation and ongoing engagement.

1.0 PURPOSE OF THE EAC APPLICATION/EIS

This Environmental Assessment Certificate Application/Environmental Impact Statement (EAC Application/EIS) for the Proposed BURNCO Aggregate Project was prepared in accordance with requirements for an environmental assessment (EA) under the British Columbia *Environmental Assessment Act*, SBC 2002, c.43 (BCEAA) and the former *Canadian Environmental Assessment Act* (CEAA) presented in the Approved Application Information Requirements/Environmental Impact Statement Guidelines (AIR/EIS Guidelines) dated December 16, 2014.

2.0 PROPOSED PROJECT OVERVIEW

2.1 Proponent Description

BURNCO Rock Products Ltd. (BURNCO, the Proponent) is a 103 years old, fourth generation aggregate construction materials business with over sixty locations in Alberta, British Columbia, Saskatchewan and Texas. A family business based in Calgary, BURNCO produces high quality aggregates, paving asphalt and ready mix concrete and also operates a network of retail landscape centres.

BURNCO's Mission Statement is to be the independent leader in the aggregate materials industry by providing valued customers with quality products, services and solutions to sustainably improve the communities they serve. BURNCO is Canada's largest independent ready-mix concrete and aggregate company, employing over 1,000 people within the four main divisions within its operations: aggregate operations, landscape centres, ready-mix operations, and asphalt operations. BURNCO Texas LLC is a ready-mix concrete supplier for home builders and commercial contractors. Located in the Dallas-Fort Worth area, BURNCO Texas LLC was formed through the acquisition of Gateway Concrete in 2013 and Image Concrete Inc. and Lucky's Redi-Mix in 2014.

Key Proponent Contacts are as follows:

Company Name: BURNCO Rock Products Ltd.

Company website: www.BURNCO.com

Project website: www.burncohowesound.com

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BURNCO Environmental Responsibility Statements

Gravel is a non-renewal natural resource and is not found everywhere. It must be located, developed and reclaimed in a responsible manner. All levels of government regulate the gravel industry.

- **Water** - BURNCO prides itself on meeting or exceeding environmental regulations for water use.
- **Dust** - To minimize any potential effect on our neighbours, BURNCO has developed and implemented a dust management plan which applies to truck transport, operations and crushing.
- **Noise** - BURNCO recognizes the importance of minimizing noise in the communities where they operate. They have developed a comprehensive noise management plan that demonstrates to its neighbours,

employees and customers that they value good relations. BURNCO's noise management plan includes policies and procedures to ensure that our noise reduction targets are met in both our operations and truck transportation.

- **Reclamation** - BURNCO reclaims their properties to final end use, sites are reclaimed back to farming and ranching. Other examples are turning lands into parks and subdivisions as a final end use of the land. BURNCO is a nationally recognized as an industry leader in responsible practice and site reclamation. Carburn Park and the Riverbend subdivision in southeast Calgary are located on a former BURNCO gravel pit. These developments demonstrate BURNCO's experience and commitment to reclamation.

2.1.1 Environmental Assessment Project Team

BURNCO commissioned Golder Associates Ltd. (Golder) to conduct the required studies and prepare an environmental assessment (EA) for the Proposed Project.

As a global, employee-owned organisation with over 50 years of experience, Golder provides a wide range of independent consulting, design, and construction services in our specialist areas of earth, environment, and energy. With over 400 of BC-based staff involved in environmental assessment and related activities, Golder is one of the largest environmental assessment consulting organisations in BC. The company has applied technical and management strategies to multiple Environmental Assessment projects; key team members are well-versed in the regulatory path comprising the British Columbia *Environmental Assessment Act* and the *Canadian Environmental Assessment Act* (former and 2012) and their associated guidance documents.

The qualifications and expertise of the professional(s) who prepared each section of the EAC Application/EIS are presented in Table 2-1.

Table 2-1: EA Project Team: BURNCO Aggregate Project

EAC Application/EIS Section	Discipline Lead	Role	Qualifications/ Credentials*
Input into all Sections. Authored Sections 1 through 4.	Alan Calder	Project Manager	B.Sc., M.A.
Input into all Sections. Authored Sections 1 through 4, Part D and Part E.	Katelyn Zottenberg	Project Coordinator	B.Sc., R.P.Bio.
5.1 Fisheries and Freshwater Habitat and Part E (input into Section 16.2.2.6, and 17.4).	David Carter	Fish Biologist, Senior Environmental Scientist	M.Sc.
5.2 Marine Resources and Part E (input into Sections 16.2.2.5, 16.2.2.11, and 16.6	Phil Rouget	Marine Biologist	M.Sc., R.P.Bio.
	Arman Ospan	Marine Biologist	M.Sc., MBA, R.P.Bio.
5.3 Terrestrial Wildlife and Vegetation and Part E (input into Sections 16.2.2.4, 17.2 and 17.3)	Kate Moss	Terrestrial Biologist	B.Sc., R.P.Bio.
5.4 Geotechnical and Natural Hazards, Part D (Section 15.1.3.2, 15.1.3.3, and 15.1.3.5), and Part E (Section 16.2.2.1, 16.2.2.2, 16.3.1 and 16.4).	Jeff Fillipone	Project Director, Senior Geologist	Ph.D., P.Geo.

EAC Application/EIS Section	Discipline Lead	Role	Qualifications/ Credentials*
5.5 Surface Water Resources (Quantity) and Part D (Section 15.1.3.6) and Part E (input into Section 17.6).	Chris Coles	Senior Water Resource Engineer	M.A.Sc., P.Eng.
5.5 Surface Water Resources (Quality and Aquatic Health) and Part E (input into Section 17.7).	Elaine Irving	Senior Environmental Scientist	Ph.D., P.Biol.
5.6 Groundwater Resources and Part E (input into Section 17.1).	Don Chorley	Senior Hydrogeologist	M.Sc., P.Geo.
5.7 Air Quality and Part E (input into Sections 16.2.2.8 and 17.5).	Jeffrey Ramkellawan,	Air Quality Engineer	M.Sc., P.Eng.
5.8 Climate Change and Part D (input into Section 15.1.3.7)	Jeffrey Ramkellawan	Air Quality Engineer	M.Sc., P.Eng.
6.1 Sustainable Economy	Derek De Biasio	Senior Socio-Economist	MPA, CMC
7.1 Social Conditions and Part E (input into Sections 16.2.2.12, 16.5 and 16.7)	Derek De Biasio	Senior Socio-Economist	MPA, CMC
7.2 Marine Transportation and Part E (input into Section 16.2.2.11)	Derek De Biasio	Senior Socio-Economist	MPA, CMC
7.3 Non Traditional Land and Resource Use	Derek De Biasio	Senior Socio-Economist	MPA, CMC
7.4 Visual Resources	Daryl Harrison	Visual and Land Use Assessment Specialist	BA, ADP, GIS
8.1 Heritage Resources and Part E (input into Section 16.2.2.10).	D'Arcy Green	Senior Archaeologist	BEd., M.A.
9.1 Public Health and input into Section 9.3.	Audrey Wagenaar	Senior Environmental Scientist	M.Sc., DABT, PChem.
9.2 Noise, input into Section 9.3, and Part E (input into Section 16.2.2.9).	Andrew Frazer	Senior Acoustical Engineer	B.Sc., INCE, P.Eng.
Part C Aboriginal Information Requirements	Monica Karpiak	Senior First Nations Consultation Specialist	M.A., RPCA, PMP
Part D Federal Information Requirements	See above	-	-
Part E Environmental Management, Monitoring and Follow-up	See above	-	-

*Registration numbers for credentials are provided in Volume 4, Part G – Section 22.0: Appendix 2, Table 2-1.

2.2 Purpose and Need for the Proposed Project

Construction aggregates are produced from sand, gravel and crushed rock, which are naturally-occurring, environmentally benign materials. The production of aggregate relies solely on physical processes (*e.g.,* sizing, crushing and washing) and no chemical processing is involved.

Aggregates are used in a wide range of construction and development uses, with each application consuming significant volumes of specialized aggregate products produced by sand and gravel pits, and/or quarries. Cumulatively, 10 to 15 tonnes of aggregate per year are consumed for every BC resident.

With the steady growth of the population of BC's South Coast, along with continued depletion of existing local aggregate supplies, there is a need to locate and develop new sources of aggregate in proximity to the Lower

Mainland. The relative cost of aggregate is often low, but transportation costs are high, often eclipsing the cost of the product. Shipping by barge on water, rather than trucking, is the most cost-effective way of transporting aggregate products, and shipping short distances by water further reduces environmental and societal costs.

The Proponent's concrete plants in the Lower Mainland are currently supplied with aggregate purchased and shipped from a combination of the following locations:

- Polaris Material Corp.'s Orca Quarry at Port McNeil located on northern Vancouver Island, BC;
- Jack Cewe Ltd.'s Treat Creek Operations located in Jervis Inlet, BC; and
- Construction Aggregates Ltd.'s gravel mine located in Sechelt, BC

BURNCO proposes to develop its own aggregate source much closer to its existing ready-mix concrete plants in the Lower Mainland. A closer supply of sand and gravel to the Lower Mainland, with reduced transportation costs, will provide more sustainable environmental options to facilitate future viable business growth. The Proponent's three other divisions (i.e., concrete, aggregate and landscape) require access to an aggregate resource to meet projected demands in the BC marketplace. Development of the Proposed Project will result in up to a 280 km one-way reduction in tug and barge tow distance from the current furthest aggregate source (i.e., Port McNeil) to the Proponent's Lower Mainland operations.

2.3 Proposed Project Setting

2.3.1 Geographic

The Proposed Project is located within the Coast Mountains adjoining Howe Sound. The Project site is on a glacially-derived sand and gravel fan-delta near sea level (10 to 50 m above sea level [asl]) at the mouth of a glaciated coastal mountain valley, on the shore of a fjord. The mountain peaks that surround the valley reach a height of more than 1,500 m asl, although the topography of the Property is relatively flat.

Based on the BC Streamflow Inventory (Coulson and Obedkoff 1998), the Proposed Project is located in hydrologic subzone 9B, Southern Coastal Mountain and comprises a portion of the McNab valley and watershed (BC Watershed Code 900-106300). The McNab Creek watershed is further classified as part of the Southern Pacific Ranges Ecosection (BC MOE 2011), which is characterized by glaciated U-shape valleys.

Upper valley slopes are generally steep, with a mantle of till glacial material or exposed bedrock, and the lower valley slopes are generally flatter with predominantly coarse substrate in the valley bottoms along the mainstream watercourses. Where it flows adjacent to the Proposed Project Area, McNab Creek has a low-gradient channel with gravel and cobble bars. McNab Creek flows along the east side of the Property outside the Proposed Project Area. There are no glaciers and few alpine areas of late-persisting snow within the watershed.

2.3.2 Climatic

The summer climate is typically warm and dry; from June until late September the average temperature is from 20 to 28 degrees centigrade (°C). Winters between November and February are typically mild and wet, with an average temperature range between 0 and 10°C. Although snowfall occurs occasionally, most of the precipitation is in the form of rain.

2.3.3 Physical

2.3.3.1 Geology

The Proposed Project site is located within the Coast Mountains adjoining Howe Sound and geologically within the "Coast Plutonic Complex", which is generally characterized as granitic plutonic bedrock. Within the site, metasedimentary rock (e.g., phyllite, slate) crops out locally on the west side of the property, although granodiorite bedrock dominates the area. In addition, some possible volcanic units are reported within the valley. The surrounding mountain peaks are dominantly formed of granodiorite plutonic rock.

Unconsolidated glaciofluvial and glacial sediments dominate the surficial geology of the Property, although post-glacial fluvial deposits occur in the valley. The sand-and-gravel fan-delta extends from the valley into Howe Sound, with a steep drop-off located a distance of a few hundred metres offshore. It is likely that the valley fan was created as glacial ice receded and decayed some ten thousand years ago, well after the present Howe Sound fjord was formed. Glacial decay would have produced significant sediment deposition due to higher water volumes.

The bedrock surface on which the fan has accumulated is likely to be undulating and irregular, with the deposit thickness ranging between 50 to 100 m (approximately). The stratigraphy of the fan is variable, with textural and compositional range consistent with the variable prevailing sedimentological and hydraulic conditions at the time and locale of deposition. In addition, sediment provenance reflects local bedrock geology and is dominated by granitic rock, with some volcanic and metamorphic components.

2.3.3.2 Soils and Vegetation

Based on available aerial imagery, much of the McNab Creek watershed is covered by thick forest, while the upper slope areas have limited vegetative cover, consistent with steep slopes nearing the alpine limit of forests. The Proposed Project area consists of unvegetated or sparsely vegetated areas; small pockets of shrub dominated, sapling forest, and young forest structural stages. Mature forest is located to the north and east, outside of the Project Area.

The Project Area is situated primarily within existing cleared areas, with highly disturbed surface soils with varying and discontinuous amounts of organic matter. Therefore, pre-reclamation land capability ratings are based in part, on this partially disturbed, pre-mine state.

As soil mapping for the Project Area is not available, soils mapping for adjacent areas (Luttmerding 1980) was reviewed to infer expected soil series within the Project Area. Anticipated soil series for the Project area include Capilano and Delta, and possibly in small areas, Banford soils. Capilano soils are described as gravelly glacial outwash deposits that are well to rapidly drained, dominated by Ortstein Humo-Ferric Podzols. Delta soils are medium to moderately fine-textured deltaic deposits varying from nonstony to excessively stony, with poor drainage, high groundwater tables, and are commonly occurring Orthic Humic Gleysols. Banford soils are described as 0.4 m to 0.6 m of well decomposed organic material overlying medium and moderately fine textured floodplain deposits. Drainage is poor to very poor, with high ground water tables and commonly occurring Terric Humisols. If Banford or similar soils exist at the site, it is likely that the continuous organic materials have been heavily disturbed.

Given the current cleared landscape conditions and the generally coarse texture nature of fluvial and a glaciofluvial deposit in the Project Area, the existing capability for forestry is estimated to be Class 3 (i.e., moderate limitations with medium to fine textures, low in fertility, and low in soil moisture with occasional inundations).

2.3.3.3 Watercourses

McNab Creek (BC Watershed Code 900-106300) flows along the east side of the Property outside the Proposed Project area. McNab Creek is a 12.7 km long fourth-order watercourse that drains directly into the marine environment of Howe Sound. Typical of coastal watersheds, the highest stream flow in McNab Creek occur during the autumn/winter months (October through January), when rainfall is greatest. From February onward, average monthly flow declines until late summer (August), when the lowest flows occur. Flows increase abruptly with the onset of the autumn rains in September and October.

Surface water systems which could be potentially impacted by the Proposed Project are:

- Approximately three small low lying wetted/wetland areas;
- McNab Creek;
- WC 2, a groundwater-fed constructed watercourse. The upper segment of this watercourse will be removed/infilled during the Proposed Project; and
- Foreshore Minor Streams WC 3, WC 3-E, WC 4-W, WC 4-E, and a portion of WC 5.

No new watercourse crossings are anticipated. Existing road crossings over Harlequin Creek and WC 5 will be maintained. All other potential effects to watercourses are related to changes in surface and groundwater flows or as a result of changes in water quality (i.e., increased suspended sediments, spills).

The valley floor groundwater regime in the Proposed Project Area during the summer months is characterized by an overall southward flow direction becoming progressively lower (i.e., flatter) toward the south of the Proposed Project Area. Within the central and southern portions of the valley floor, the groundwater regime is characterized by convergent southwestward and southeastward flow, toward Watercourse 2 (WC 2). The convergent flow is interpreted to be result of the hydraulic influence of the deeply excavated channel, which represents an artificial

groundwater drainage pathway that has reduced groundwater levels in areas directly adjacent to the watercourse and altered both groundwater flow directions and flow gradients. The monitoring data indicates that, following construction of WC 2, permanent reductions of approximately 2 m to 3 m have potentially occurred within the central and northern reaches of this watercourse. The groundwater flow pattern during the winter months are similar to the one observed during the summer months; however, the hydraulic heads are overall higher, in particular in the west portion of the valley fill aquifer. This results in overall steepening of hydraulic gradients in the west and WC 2 that intersects the center of the aquifer.

On rare occasions between July and September, tidal elevations can exceed groundwater elevations within 500 m of the marine shoreline. During these high tide intervals, there is an inferred northward gradient between the tidal regime and the inland groundwater regime in the immediate vicinity of the shoreline. However, the duration of the landward gradient is less than the corresponding periods of southward gradient associated with lower tidal position. Accordingly, the net groundwater flow direction remains southward toward the marine foreshore, despite the observed tidal influence in the nearest monitoring wells.

Project-related water use will be limited to a 95% efficient wash plant and emergency use for fire suppression. The wash plant will use approximately 110 litres per second (1,450 gpm), of which 106 litres (3,052,800 to 3,816,000 litres per day[2]) will be recycled water supplied from two large storage tanks. The remaining 4 litres per second (50 gpm or 115,200 to 144,000 litres per day[2]) will be supplied from a groundwater well.

2.3.4 Biological

2.3.4.1 Regional Ecosystems

The Project site is located within the Coastal Western Hemlock very wet maritime biogeoclimatic zone, submontane (CWHvm1) variant. The CWH zone transitions, with increased elevation, to the Mountain Hemlock (MH) zone, which in turn transitions to the Coastal Mountain-heather Alpine (CMA) zone. These ecosystems are composed of old growth forests, mature forest, wetlands, shrub-dominated sapling forest, and young forest structural stages, and unvegetated or sparsely vegetated areas.

2.3.4.2 Environmentally Sensitive Areas

The Proposed Project does not overlap with any federally or provincially designated critical or sensitive habitat areas. In addition, approved Wildlife Habitat Areas (WHAs) or Ungulate Winter Ranges (UWRs) do not occur within the Proposed Project Area or LSA. The nearest approved WHAs are found to the north of the LSA and were established for marbled murrelet (*Brachyramphus marmoratus*), while the nearest UWR was established for mountain goat (*Oreamnos americanus*) in high elevation habitat approximately 900 m northeast of the LSA (Government of BC 2016). Twelve provincially and/or federally listed terrestrial species were recorded within the LSA during field surveys; two amphibian, nine bird, and one mammal species. Five federally listed species marine mammal are likely to occur near the Proposed Project Area and barging route. A desktop review of existing

[2] Based on typical hours of operation (8 to 10 hours/day)

information indicated 11 listed vascular plant species have the potential to occur within the LSA (BC CDC 2016). Rare plant surveying did not identify rare plants in the Proposed Project Area.

Baseline habitat suitability was estimated using HSI models for select VCs. Suitable nesting habitat was identified for northern goshawk, western screech owl, and common nighthawk nesting. Moderate and high suitability winter habitat for Roosevelt elk as well as high suitability grizzly bear forage habitat was also identified. Roosevelt elk were recorded on multiple occasions on remote wildlife cameras and grizzly bears were recorded during the field surveys.

No environmentally sensitive areas or habitats occur within the Marine Resources LSA at the Proposed Project marine terminal facilities (barge load-out jetty and walkway, conveyor, mooring buoy). Sensitive habitats, such as rockfish conservation areas and glass sponge reefs, overlap with the Marine Resources LSA along the shipping route from the Proposed Project through Ramillies, Thornbrough and Queen Charlotte channels in the southern part of Howe Sound. Also, eelgrass, an important marine habitat-forming species, has been found in coastal areas of Gambier Island, Bowen Island and other islands along the shipping route in Howe Sound.

2.3.5 Human

2.3.5.1 Nearby Non-Aboriginal Communities and Temporary Human Receptor Sites

The Proposed Project area is currently accessible only by boat, float plane or helicopter, and a dock is currently located on the west side of the Property. The marine foreshore of the Property includes an intertidal sand and gravel beach that extends 150 to 300 m outward from the high tide line. The western 500 m of the foreshore area is overlapped by the foreshore lease, which was historically used as a log booming and log dump area. The distance from the Proposed Project to nearby communities and temporary human receptor sites in Howe Sound, including notations to receptor viewpoints on Figure 7.4-3, are presented in Table 2-2.

Table 2-2: Distances to Nearby Communities and Temporary Human Receptor Sites

Surveyed Viewpoint ID (Appendix 7.4-A)	Receptor Viewpoint ID (Figure 7.4-3)	X Coordinate	Y Coordinate	Description	Distances from Project Area (km)
PID 1	VP 1	479916.39	5481194.84	Marine-based viewing opportunity in Howe Sound related to VLI viewpoint # 264.	11.8
PID 2	-	477714.47	5483460.29	Marine-based viewing opportunity south of Anvil Island and related to VLI viewpoint # 264	8.6
PID 3	VP 2	475363.43	5485775.15	Marine-based viewing opportunity in Ramilles Channel near Douglas Bay on Gambier Island	5.3
PID 4	-	473978.03	5487045.08	Marine-based viewing opportunity in Ramilles Channel northwest of Gambier Island	3.4
PID 5	-	472469.61	5487032.36	Viewing opportunity at Ekins Point on Gambier Island (near Yacht Club)	2.7
PID 6	VP 3	471897.13	5488170.02	Marine-based viewing opportunity in Thornbrough Channel	1.5
PID 7	VP 4	472597.48	5489765.19	Viewing opportunity near McNab Estates dock	0.7
PID 8	VP 8	471561.49	5486320.15	Viewing opportunity at Camp Latona	3.3
PID 9	-	482867.22	5478578.9	Viewing opportunity from Lions Bay General Store parking lot	15.7
PID 10	-	482915.12	5478547.4	Viewing opportunity near Lions Bay village office	15.8
PID 11	VP 6	482496.39	5479923.49	Motorist viewing opportunity north of Lions Bay on Highway 99	14.5
PID 12	VP 7	482019.43	5481314.42	Motorist viewing opportunity at recreation pullout on Highway 99; VLI viewpoint# 265	13.2
PID 13	VP 8	482955.85	5478336.37	Lions Bay residential viewing opportunity (Panorama Rd. & Oceanview Rd.); near VLI viewpoint# 263	15.9
PID 14	-	482656.3	5478762.67	Lions Bay residential viewing opportunity (end of Lions Bay Rd.); near VLI viewpoint# 261	15.4
PID 15	VP 9	482635.39	5478155.95	Recreational viewing opportunity at Lions Bay Beach Park	15.8
PID 16	-	482533.64	5480015.56	Recreational viewing opportunity along the Centennial Trail above Highway 99	14.5
PID 17	-	482950.55	5473659.38	Motorist viewing opportunity south of Lions Bay on Highway 99	19.5
PID 18	-	483091.72	5479176.1	Lions Bay residential viewing opportunity (Mountain Dr.)	15.4
PID 19	-	482981.38	5477681.34	Lions Bay residential viewing opportunity (Kelvin Grove Rd.)	16.4

NOTES: Coordinates projected in NAD83 UTM Zone 10.

McNab Creek Strata is located to the east of McNab Creek, approximately half a kilometre from the northern boundary of the BURNCO property. McNab Creek Strata is a bare land strata[3] and includes 16 lots, as well as 22 ha of adjacent forested land on the hill to the east of McNab Creek. Access is water only to the McNab Creek Strata properties.

Gambier Island is the largest island in Howe Sound, approximately twenty-five square miles in area. Its northern end is located about 2.7 km across Howe Sound from the Proposed Project. Gambier Island has a permanent full-time population of approximately 100 to 130 residents and a part-time population of between 550 and 750 residents who visit it on weekends and summer vacations. The permanent population on Gambier Island is concentrated in its southern areas, at New Brighton, Gambier Harbour and West Bay. The closest residential properties on Gambier Island to the Proposed Project are at the northern end of the island. At Ekins Point (about 2.7 km from the Proposed Project), there are three residential lots, two of which have recreational houses. About 3.7 km to the east of the Proposed Project, there are 53 lots at Douglas Bay. Approximately 10 recreational homes have been built at Douglas Bay to date.

Camp Latona is the closest youth camp to the Proposed Project, located at the northern end of Gambier Island and approximately 3.2 km from the Proposed Project. Camp Latona, Camp Potlatch, Daybreak Point Bible Camp and Camp Sunrise reportedly use Thornbrough Channel for water based activities such as water skiing and canoeing.

2.3.5.2 Aboriginal Communities and Territories

The *Sḵwx̱wú7mesh* (Squamish) Nation and the Tsleil-Waututh Nation have indicated that the Proposed Project is located within their traditional territories. Information regarding the following Aboriginal Groups has also been presented in the EAC Application/EIS because of the proximity of components of the Proposed Project to their asserted traditional territories or consultation areas.

- Musqueam Indian Band;
- Stz'uminus First Nation;
- Cowichan Tribes;
- Halalt First Nation;
- Lake Cowichan First Nation;
- Lyackson First Nation;
- Penelakut Tribe; and
- Métis Nation British Columbia.

[3] Strata interests are collectively associated with the bare land, not the structures that individual owners construct, therefore maintenance and repair of buildings is the responsibility of the individual owner rather than the strata (Gioventu 2014).

Information regarding Indian Reserves, Treaty Settlement Areas, Consultation Areas, if applicable, and spatial extent of each Aboriginal Groups' territorial interests, are provided in Section 10-1, along with information pertaining to population, language, governance, land use planning, and economic interests, where available. Maps of the traditional territories of the identified Aboriginal Groups, including the location of Indian Reserves, traditional territories or consultation areas based on information currently available, are provided in Figure 10-1 through Figure 10-7.

The distances from the Proposed Project to the locations of First Nation reserves are presented in Table 2-3. The closes First Nations reserves to the Proposed Project Area are *Sḵwx̱wú7mesh* (Squamish) Nation's Kwum Kwum IR (7.15 km), Defence Island IR28 (7.95 km), and Kaikalahun IR25 (8.07 km) (Figure 2-1).

Table 2-3: Distances to Locations of First Nations Reserves

Aboriginal Group	First Nations Reserve	Distances from Project Area (km)
Sḵwx̱wú7mesh (Squamish) Nation	Mission Indian Reserve IR1	34.38
	Seymour Creek IR2	38.00
	Capilano IR5	31.22
	Kitsilano IR6	36.31
	Skowishin IR7	40.29
	Chuckchuck IR8	45.01
	Poyam IR9	46.60
	Skowishin Graveyard IR10	38.08
	Cheakamus IR11	28.39
	Yookwitz IR12	28.03
	Poquiosin and Skamain IR13	27.60
	Waiwakum IR14	27.40
	Aikwucks IR 15	26.53
	Seaichem IR16	26.63
	Kowtain IR17	25.77
	Yekwaupsum IR18	23.72
	Yekwaupsum IR19	24.48
	Stawamus IR24	21.45
	Kaikalahun IR25	8.07
	Chekwelp IR26	17.95
	Chekwelp IR26A	17.62
	Schaltuuch IR27	18.15
	Defence Island IR28	7.95
	Kwum Kwum IR	7.15
Tsleil-Waututh Nation	Burrard Inlet IR3	39.83
	Inlailawatash IR4	37.73
	Inlailawatash IR4A	37.44
Musqueam Indian Band	Musqueam IR 2	37.59
	Sea Island IR3	41.09
	Musqueam IR4	57.51
Stz'uminus First Nation	Chemainus IR13	63.81
	Oyster Bay IR12	67.98
	Squaw-Hay-One IR11	75.95
	Say-La-Quas IR	76.77

Aboriginal Group	First Nations Reserve	Distances from Project Area (km)
Cowichan Tribes	Cowichan IR1	88.19
	Cowichan IR9	90.80
	Est-Patrolas IR4	94.92
	Kil-Pah-Las IR3	92.32
	Kakalatza IR6	94.22
	Skutz IR7	95.45
	Skutz IR8	95.17
	Theik IR2	92.22
	Tzart-lam IR5	94.13
Halalt First Nation	Halalt IR2	78.17
	Halalt Island IR1	75.12
Lake Cowichan First Nation	Cowichan Lake	94.56
Lyackson First Nation	Lyacksun IR3	53.76
	Portier Pass IR5	61.89
	Shingle Point IR4	59.85
Penelakut Tribe	Penelakut Island IR7	66.39
	Galiano Island IR9	62.32
	Tent Island IR8	71.81
	Tsussie IR6	77.51
Métis Nation British Columbia	North Fraser Métis Association	48.80
	Fraser Valley Métis	97.99
	Golder Ears Métis Society	68.58
	Chilliwack Métis Association	112.18
	Waceya Métis Association	97.00
	Nova Métis Heritage Association	56.55

The distances from the Proposed Project to the locations of named places that may be temporary Aboriginal use sites (i.e. areas used for ceremonial purposes, fishing/hunting camps, etc.) that are located in Howe Sound are presented in Table 2-4. Information on these sites, and additional locations outside of Howe Sound, was obtained from the publicly available sources listed in Table 10-1 in Part C Aboriginal Information Requirements, and may not reflect the full range of named places in the vicinity of the Proposed Project. The closest temporary Aboriginal use site to the Proposed Project Area is *kw'ech'tenm*, a *Sḵwx̱wú7mesh* (Squamish) Nation village site, located at McNab Creek (approximately 1 km from the Proposed Project).

Table 2-4: Approximate Distances to Temporary Aboriginal Use Sites in Howe Sound

Name	Aboriginal Group	Location Description	Approximate Distance to Proposed Project (km)
Chaich-ph	*Sḵwx̱wú7mesh* Nation	Keats Island	19
Ch'axay *Ch'axa'y*	*Sḵwx̱wú7mesh* Nation	Southern edge of Howe Sound in Horseshoe Bay	23
Ch'a'7elsm	*Sḵwx̱wú7mesh* Nation	On the eastern shore of Gambier Island	13

Name	Aboriginal Group	Location Description	Approximate Distance to Proposed Project (km)
Ch'ekchkekts	*Skwxwú7mesh* Nation	Small stream up the Squamish	20
Ch'kw'elhp	*Skwxwú7mesh* Nation	Southwestern edge of Howe Sound	22
Kw'émkw'em	*Skwxwú7mesh* Nation	Defense Islands	8
kw'ech'tenm	*Skwxwú7mesh* Nation	McNab Creek	1
Kwtsa7stsutsin	*Skwxwú7mesh* Nation	Shannon Bay	20
Lháxwen Lhaxwn	*Skwxwú7mesh* Nation	Anvil Island	7
P'ap'k	*Skwxwú7mesh* Nation	Stream in Lion's Bay	17
Stamas *Sta'mis*	*Skwxwú7mesh* Nation	Head of Howe Sound	18
Tl'etl'ch'a'lkm	*Skwxwú7mesh* Nation	Eastern shore of Howe Sound	Approximate location unknown
Tsi'tsusm	*Skwxwú7mesh* Nation	Mouth of Potlatch Creek – western shore of Howe Sound	Approximate location unknown

2.4 Proposed Project Description

A detailed Project Description (dated February 8, 2010) was submitted to the BCEAO as the basis for designating the Proposed Project as a "reviewable project" under BCEAA. The February 8, 2010 Project Description was also provided to the CEA Agency; an updated Project Description (dated December 16, 2011) was subsequently submitted to both the BCEAO and the CEA Agency. Refinements to the size and orientation of some on-site components were made following detailed engineering design of the processing area and the associated system of tunnels and above ground conveyors.[4]

A general description of the proposed BURNCO Aggregate Project is described below.

BURNCO is proposing to construct and operate a sand and gravel mine ("the Proposed Project") within the Lower McNab Valley (Figure 2-1). Based on preliminary volume estimates, the aggregate resource is projected at 20 million tonnes of sand and gravel. The actual commercially-extractable aggregate resource volume will be revised depending upon the information and design of the mine plan and the aggregate resource evaluation, but is expected to average 1,000,000 tonnes per year. The expected economic lifespan of the Proposed Project is 16 years.

[4] A letter describing and illustrating the nature, extent, and rationale for these changes was provided to the BCEAO and to the CEA Agency on August 5, 2014.

Sorted aggregate products will be conveyed from the plant to sand and gravel barges via a barge-loading facility adjacent to the marine foreshore to the south of the pit, which is located within an existing foreshore lease and log dump area at the southwest corner of the Property (Figure 2-3). Barged aggregate products will be delivered to existing facilities owned and operated by the Proponent in either Burnaby or Langley along established barge shipping routes and marine navigation channels.

2.4.1 Project Location

The Proposed Project is located on a flat, glacial fan-delta deposit comprising sand and gravel on the western shore of Howe Sound's Thornbrough Channel, north of Gambier Island. The Proposed Project is located approximately 22 km west-southwest of Squamish and 35 km northwest of Vancouver (Figure 2-1), with geographic coordinates of 49° 34' 00"N, 123° 23' 20"W.

The Proposed Project will be developed within a 70 ha clear cut (in 2004 to 2005) area in the southern portion of a 320 ha, privately-owned Property ("the Property") that has been owned since 2008 by 0819042 BC Ltd and BURNCO Rock Products Ltd. The mine will be located on a 30 hectare (ha) portion of the Property. The individual properties that together comprise the Property are:

- DL 677 LD 37 New Westminster Group 1;
- DL 677A LD 37 New Westminster Group 1;
- DL 677B LD 37 New Westminster Group 1;
- PCL A DL 677B LD 37 New Westminster Group 1; and
- Foreshore Tenure #240515.

The Property is located in the Sunshine Coast Regional District (SCRD) and is presently designated as private land zoned as rural land use, with no zoning for the foreshore area adjacent to the site. The Proponent currently holds all mineral tenures and mining claims on the entire Property. McNab Creek (BC Watershed Code 900-106300) flows along the east side of the Property outside the Proposed Project Area. McNab Creek is a 12.7 km long fourth-order watercourse that drains directly into the marine environment of Howe Sound.

2.4.2 Site Access

The Property was formerly four-wheel-drive accessible along a network of logging roads. However, many of these roads were decommissioned in 2008 and 2009 under existing obligations by Canfor Ltd. (a previous site owner), and consequently vehicular access is via all-terrain-vehicle only. Outside the Property, a road passes along the western side of the valley, with other roads and paths branching off to access other areas (Figure 2-2). The Proponent does not plan to improve the direct road access to the Property.

Currently, the Property is readily accessible only by boat, float plane or helicopter, which can land at the west portion of the site beach area at an existing dock and shoreline barge loading area.

The Proponent will manage the Property as private forest lands and will accommodate other industrial or transportation use, along with the needs of neighbouring property owners including:

- BCTS, for access to crown lands in upper portions of the watershed;
- BC Hydro for access to the existing transmission line right-of way; and
- Fortis BC to support maintenance of the existing natural gas pipeline in the upper portions of the watershed.

At the end of the Proposed Project's life span, the Proponent will maintain ownership and manage long-term stewardship for forest, fisheries, wildlife, and water resources on the Property.

2.4.2.1 Industrial Site History

Logging activity in the valley dates back to 1900 and has continued on the site, most recently, in the upper watershed since 2015. The McNab mainline forest road and 48 culverts have been upgraded by BCTS in 2011 and 2012 to support forest harvesting on crown lands north the Proponent's property. Canfor began large-scale logging operations in the valley in the 1970s and established a logging camp, warehouse and maintenance facilities near the beach. Canfor also established a water licence on Harlequin Creek (now held by the Proponent) and ran a log dump and storage area in proximity to the camp until the late 1990s.

In addition to forestry activities, rock quarrying in the valley began in 1941 through the establishment of a small rock quarry near the river mouth to supply material for the construction of logging roads. Mining activity took place from 1947 to 1963 (MINfile 092GNW009) at a quarry located in the southwestern portion of the property, described as being on the shoreline of Thornbrough Channel, 3.2 km west along the coastline from the mouth of McNab Creek. Between 1955 and 1963, 12531 tonnes of material described on the MINfile webpage as "slate" was quarried for use as flagstone, asphalt roofing granules and filler. The rock is described as metavolcanic and metasedimentary rock that forms a roof pendant in Jurassic to Tertiary Coast Plutonic Complex quartz diorite.

In 1965, BC Hydro constructed a 138kV transmission line across the southern shoreline portion of the Property. The transmission line right-of way (RoW) is 50 m in width and runs across approximately 2 km of the Proponent's private lands.

A groundwater-fed watercourse on the Property was designed and constructed by DFO as habitat offsetting for work (e.g., dredging) undertaken off-site by Howe Sound Pulp and Paper Limited Partnership (HSLP). The objective of the constructed watercourse was to provide spawning and rearing habitat for chum and coho salmon. The watercourse was constructed in three phases between 1985 and 2003 (Figure 2-3).

- Phase 1 - The first (and furthest downstream) portion was constructed in 1985;
- Phase 2 - The middle portion was constructed in 1998; and
- Phase 3 - The upper portion (above the BC Hydro RoW) was constructed from 2001 to 2003.

The watercourse is approximately 1,225 m long, with an average wetted width of approximately 4 to 12 m. It is groundwater-fed; no water from McNab Creek flows directly into the constructed watercourse.

To reach the water table, Phase 3 was constructed within a deep (> 6 to 9 m) excavated ditch. The banks of this ditch are long (>15m) and steep, with a grade of approximately 1.2 Horizontal: 1 Vertical (> 40° slope), and composed of sand, gravel, and cobbles. The fine material in the ditch banks is eroding into the watercourse, and consequently the spawning substrates in the Phase 3 constructed watercourse have become covered by and embedded within fine sediment material. Only short segments of the upper portion of the watercourse appear to be functioning as spawning habitat for chum salmon. The lower and middle currently function only as juvenile salmonid rearing habitat.

In 1997, Westcoast Gas Services proposed an above-ground liquid natural gas (LNG) storage facility in the upper valley. Although it received a provincial EA Approval in 1999, the LNG project was not developed. AJB Investments Ltd (AJB), a division of the Surespan Group of Companies, owned the site between 2004 and 2006, and sought the development of a sand and gravel pit in the lower portions of the property. However, AJB did not obtain a Mine Permit for this development. In 2006 Canadian National Investments (CNI) purchased the site and undertook forest harvesting across >90% the property during their period of site ownership. CNI also undertook preliminary planning for a rail depot, deep-sea container port, along with a sand and gravel quarry on the site. These projects did not proceed beyond the planning stage and on April 4, 2008 the Proponent's sister company, 0819042 BC Ltd, purchased the site.

2.4.2.2 Investigative Work Completed

The earliest aggregate potential assessment work undertaken at the site was conducted in 1970 on a 107 ha property by H. R. Stirling, P.Eng., Consulting Engineer, on behalf of for Construction Aggregates Ltd. That project consisted of the drilling of nine Becker holes to a maximum depth of 39 m on the west side of McNab Creek and physical aggregate quality testing.

In addition, in 2005, EBA Engineering Consultants Ltd. conducted an investigation that consisted of 4 sonic holes drilled to approximately 14 m depth.

Thurber Engineering undertook a test pitting and laboratory testing program in 2008, on behalf of BURNCO. This consisted of the excavation of 40 test pits to a depth of 2 – 5 m, and gradation testing of bulk samples from nine test pits. The report by Thurber also referenced the earlier Stirling and EBA studies at the site. General conclusions from these earlier investigations, as indicated in Thurber's report, were as follows:

- The deposit contains at least 51 million tons (30 million m^3) of granular material, of which 77% lies below the water table (Stirling report);
- 46.5 million tons (25 Million m^3) could be extracted to yield 38 million tons (20 million m^3) of marketable gravel with excavation of up to 36 m below the water table (Construction Aggregates Ltd.);

- The quality of aggregate as determined by soundness, LA abrasion and other laboratory tests was judged to be “satisfactory” and “completely acceptable for concrete and asphalt aggregate except for the presence of up to 40% of metamorphic rock in the deposit” (Construction Aggregates Ltd.);
- A clay layer was detected in the middle of the deposit from 9.0 to 11.5 mm depth (EBA Engineering Consultants Ltd.);
- Bedrock was encountered at 13.7 m depth (EBA Engineering Consultants Ltd.);
- The deposit generally contained well graded granular material with varying silt, cobble and boulder contents (Thurber Engineering); and
- When encountered, the water table was at 1 to 3 m depth (Thurber Engineering).

In 2009 and 2010, Golder (2012) carried out a staged program of test pitting and Becker hammer drilling. Test pitting was conducted in May 2009 and Becker drilling was conducted in June 2010. Initial testing consisted of grain size analysis and the results formed the basis for further aggregate quality testing. In addition, one sample was collected in April 2009 from the northeast bank of the upper portion of the “constructed groundwater channel” located on the property. Sieve analysis and organic impurities testing was carried out on this sample. Testing was performed on samples in accordance with CSA A23.1-23.2-09.

Golder reported test data to assist in the characterization of samples of sand and gravel proposed for use as aggregate, to assess their suitability for such uses. Specific tests were conducted to evaluate grain size distribution, lithological composition, physical engineering quality and chemical characteristics. Key findings from this evaluation included:

- Grain size is variable from cobble- and boulder-size particles to silt-sized material, with relatively coarser near-surface zones and another gravel rich zone, which is discernible to varying degrees in the deposit;
- Lithologically, the material is indicated to be composed of at least 50% plutonic rock types, mixed with various proportions of amphibolite and metasedimentary rock types;
- The quality of the material is, based on the petrographic examination, less dependent on the lithological composition than the degree of weathering and oxidation, which is generally more intense in surficial units;
- Overall the tested samples comply with the physical testing criteria for coarse concrete aggregate;
- Organic material was present in sufficient amounts in many of the samples that the fine portion of the samples failed the organic impurities test, in particular those sampled at depths shallower than 17 – 20 m (55 - 65 ft);
- Compressive strength results indicate that the quality of the fine sample material may be less than optimal, due to the presence of mica, chlorite, phyllite and particles weakened by weathering. Further assessment of this characteristic may be warranted once production is initiated; and
- The material represented by the tested samples did not constitute a potential source for ARD.

In 2013, Golder was retained by BURNCO to collect samples of the fine aggregate (≤ 0.075 mm) that will be placed in the temporary fine stockpiles (Golder 2014). Fine aggregate samples were submitted for geochemical testing (Acid Base Accounting, total metal analysis, and sequential leach testing) to understand the acid rock drainage (ARD) and metal leaching (ML) potential of the material that will be stored in the waste stockpiles. It is considered unlikely that this material will generate acidity in the long term. The primary source of sulphur in the fine material was sulphate and insoluble (i.e., organic) sulphur. Sulphate sulphur and organic sulphur provide short-term, soluble acidity typical of soils. The samples have a low sulphide-sulphur content (i.e., <0.03%); therefore, there is no source of sulphide minerals to generate acidity.

The results of solid phase analysis identified several elements that occur at elevated concentrations in samples of fine material relative to average crustal abundances, including iron, arsenic, bismuth, copper, phosphorus, selenium, silver, tin, uranium, and tungsten. The results of repetitive short-term leach tests were used to confirm the metal leaching potential of these samples. Concentrations several elements exceeded the BCWQ and/or CCME Guidelines for the protection of Freshwater Aquatic Life in at least one leachate sample during the sequential leach testing procedure, including aluminum, cadmium, cobalt, copper, manganese, mercury, silver, and zinc. Leach test results have been used to develop inputs to the water quality predictions for the Proposed Project.

Based on preliminary volume estimates, the aggregate resource is projected at 20 million tonnes of sand and gravel, giving the Proposed Project an expected economic lifespan of 16 years. Investigations to confirm the size of the resource have been undertaken to more accurately determine the size and characteristics of the deposit. The extraction model used for the site will dictate the actual tonnage of aggregate production. Variables used to estimate the actual extracted volumes include:

- Geometry of pit;
- Side slope angles;
- Stratigraphy of deposit (e.g., textures, quality, thickness of various formations);
- Setbacks used in pit development;
- Depth of extraction; and
- Pit surface area.

The actual commercially-extractable aggregate resource volume will be revised depending upon the information and design of the mine plan and the aggregate resource evaluation, but is expected to average 1,000,000 tonnes per year.

2.5 Proposed Phases of Development

The phases of development of the Proposed Project are:

- Project (capital) construction (up to 2 years);
- Project operation and maintenance (16 years); and
- Project reclamation and closure (on-going[5] and 1 year beyond operations).

Proposed Project activities associated with each of these phases of development are presented in Table 2-5.

Table 2-5: BURNCO Aggregate Project: Phases of Development and Associated Activities

Project Activities	Description
Construction	
1. Crew and equipment transport	▪ Daily water taxi ▪ Tug and barge transport of machinery/materials (est. 8 loads) ▪ Barge household and industrial solid waste barged off-site
2. Site preparation, including construction of the berms and dyke	▪ Logging, clearing and grubbing ▪ Grading ▪ Construction of the berms and dyke ▪ Compaction and laying of gravel base ▪ Limited improvements to existing on-site road infrastructure
3. Processing area installation, including conveyors and materials handling system	▪ Installation and use of portable concrete batch plant for construction ▪ Installation of concrete foundations ▪ Installation of screens, crushers, wash plant, conveyor system and automated materials-handling system (i.e., reclaim tunnels) ▪ Installation of groundwater well as a source of make-up water for the wash plant
4. Substation construction and connection	▪ Construct electrical substation adjacent to existing BC Hydro transmission line ▪ Construct outdoor switchyard, electric building, and 100 m transmission line
5. Marine loading facility installation	▪ Remove existing mooring dolphins ▪ Steel pile installation ▪ Installation of conveyor, barge movement winch and mooring dolphins
6. Pit development	▪ Dry excavation to remove overburden/topsoil ▪ Installation of clamshell and floating conveyor

[5] Progressive and ongoing reclamation activities will occur throughout all phases of mine development.

Project Activities	Description
7. Other ancillary land-based construction works	▪ Temporary construction infrastructure set up (trailers, temporary power, etc.) ▪ Upgrades to the existing heavy equipment maintenance shop and warehouse ▪ Upgrades to the existing fuelling facility for the storage of diesel and gasoline for on-site equipment ▪ Construct site office, communications building, workers lunch/dry room, caretaker's cabin, first aid facility and helipad ▪ Install contained washroom facilities ▪ Construct pump room for well/stream intake water distribution and fire-fighting
8. Other ancillary marine construction works	▪ Removal of existing small craft dock; install temporary dock for worker access ▪ Construct new floating small craft dock, the with tie-up area for a float plane, serviced with 30 amp (A) 125 volt (V) shore power ▪ Barge household and industrial solid waste off-site
Operations	
9. Crew transport	▪ Daily water taxi
10. Aggregate mining	▪ Use of electric powered floating clamshell dredge ▪ Primary screening and conveyance of extracted material to processing area ▪ Install groundwater plug in WC 2
11. Processing (screening, crushing, washing)	▪ Screening to separate aggregate sizes ▪ Oversized gravels crushed ▪ Operation of wash plant fed using recycled water from two large storage tanks, supplemented with make-up water by a groundwater well. ▪ Drying and storage of fines and silt
12. Progressive reclamation	▪ Ongoing earth works (including site clearing, surface material removal) ▪ Fines and silt mixed with organic overburden material and used for infilling, re-vegetation and landscaping
13. Stockpile storage	▪ Processed sand and gravel conveyed to stockpile area ▪ Storage of processed materials in stockpiles
14. Marine loading	▪ Transfer of stored material using marine conveyor system ▪ Barge loading ▪ Site and navigational lighting
15. Shipping	▪ Barge traffic (delivery/collection) in Howe Sound, Ramillies Channel, Thornbrough Channel, and Queen Charlotte Channel ▪ Tug and barge transport of fuel and consumables ▪ Navigational lighting
16. Refueling and maintenance	▪ Refueling and maintenance of on-site equipment
Reclamation and Closure	
17. Crew and equipment transport	▪ Daily water taxi movements ▪ Tug and barge transport of machinery/materials ▪ Barge household and industrial solid waste barged off-site

Project Activities	Description
18. Removal of land-based infrastructure	▪ Remove surface facilities, including electric powered floating clamshell dredge, conveyor system, screens, crushers, wash plant, automated materials-handling system, heavy equipment maintenance shop and warehouse, fuelling facility, site office, communications building, workers lunch/dry room, caretaker's cabin, first aid facility, helipad and contained washroom facilities
19. Removal of marine infrastructure	▪ Remove marine facilities, in marine load out facility, jetty, conveyors and piles
20. Site reclamation	▪ Final completion of the pit lake, landscaping and re-vegetation to develop a functional ecosystem in the freshwater pit ▪ Landscaping and re-vegetation of processing area, berms and dyke

Equipment anticipated to be used during construction include:

- 1700 hp tug boat;
- 300 hp diesel crane;
- 503 hp Liebherr land crane;
- Caterpillar 140M grader;
- Caterpillar 980K loader;
- Caterpillar CS64 packer;
- John Deere 460E haul truck;
- John Deere 470 G LC excavator;
- John Deere 850k XLT dozer; and
- Vibratory hammers (APE 200), or impact (Drop Hammer 10,000lb).

Equipment anticipated to be used during Proposed Project operations are described in Table 2-6.

Table 2-6: Proposed Project Operation Equipment

Equipment	Description/Specifications
Electric Powered Clamshell Dredge	One clamshell dredge on floating deck
Grizzly Screen	One primary grizzly screen on floating deck
Screen Motor for Grizzly Screen	Two motors for the grizzly screen on floating deck
Jaw Crusher	Primary crusher on floating deck
Crusher Motor for Jaw Crusher	One motor for crusher on floating deck
Dry Screen 1 and associated motor	Two dry screens and associated motors in crush plant
Dry Screen 2 and associated motor	Two dry screens and associated motors in crush plant

Equipment	Description/Specifications
Crusher in Crush Plant	One crusher in crush plant
Crusher Motor for Crusher in Crush Plant	Two motors for the crusher in crush plant
Washer Unit in Wash Plant	One screen washer unit in wash plant
Washer Pump with Motor	One washer pump and its motor in wash plant
Conveyor System in Clamshell Dredge Operation	One conveyor system in clamshell dredge operation
Conveyor System in Crush Plant	One conveyor system in crush plant
Conveyor System in Wash Plant	One conveyor systems in wash plant
Conveyor System in Barge Loading Area	One conveyor system barge loading area
Conveyor Motors in Clamshell Dredge Operation	Each conveyor belt has one conveyor motor on one end
Conveyor Motors in Crush Plant	Each conveyor belt has one conveyor motor on one end
Conveyor Motors in Wash Plant	Each conveyor belt has one conveyor motor on one end
Conveyor Motors in Barge Loading Area	Each conveyor belt has one conveyor motor on one end
Front End Loader Filling Wash Plant Hopper	Front end loader loading gravels to hopper in wash plant
Loading and Transportation Equipment	Backhoe, loader and dump truck beside the stockpiles
8.5 m water taxi	Transport crew to/from site 260 days per year
One 26 m tug and two 5,500 deadweight tonnage (DWT) barges (80 m in length, draught 4.5 m).	Transport aggregate from site 190 days per year

A list of project-related gas powered equipment is provided in Table 2-7.

Table 2-7: Project-Related Gas Powered Equipment

Phase	Gas-Powered Equipment
Construction	▪ 1700 hp tug boat; ▪ 300 hp diesel crane; ▪ 503 hp Liebherr land crane; ▪ Caterpillar 140M grader; ▪ Caterpillar 980K loader; ▪ Caterpillar CS64 packer; ▪ John Deere 460E haul truck; ▪ John Deere 470 G LC excavator; ▪ John Deere 850k XLT dozer; ▪ Vibratory hammers (APE 200), or impact (Drop Hammer 10,000lb); and ▪ Pick-up trucks (5)
Operations	▪ Front End Loader Filling Wash Plant Hopper; ▪ Loading and Transportation Equipment - backhoe, loader and dump truck; ▪ One 1700 hp tug boat; and ▪ Pick-up trucks (2)

2.5.1 Project Components

A description of the onsite and offsite components of the Proposed Project is described below. Refinements made to the Proposed Project over time to address operational issues, and comments and concerns raised by agencies, First Nations and the public are presented in Table 2-8.

Table 2-8: BURNCO Aggregate Project Component Revisions

Project Component	Feb 2010	Dec 2011	Sept 2013	Current Proposal
Aggregate Pit Development				
Production rate (million tonnes per annum (MTPA)	1.0 to 1.6 MTPA	1.0 to 1.6 MTPA	1.0 MTPA (ave) 1.6 MTPA (max)	1.0 MTPA (ave) 1.5 MTPA (max)
Mine life	20 to 30 years	20 years	15 to 20 years	16 years
Electric powered floating clamshell dredge	✓	✓	✓	✓
Pit dewatering	X	X	X	X
Explosives	X	X	X	X
Max depth of pit pond	55 m below surface	55 m below surface	35 m below surface	35 m below surface
Processing				
Conveyor from pit pond	✓	✓	✓	✓
Size of processing area	125 m x 250 m	100 m x 175 m plus temporary fines stockpile area	25,200 m^2 Approx. 140 m x 180 m. Setback from identified fish habitat. Temporary fines stockpile area removed.	40,785 m^2 Approx. 250 m x 200 m. Setback from identified fish habitat.
Treed foreshore buffer maintained	✓	✓	✓ 75 to 160 m wide adjacent to processing area.	✓ 25 to 50 m wide adjacent to processing area plus extended 20 m wide dirt berm.
Screening to separate aggregate sizes	✓	✓	✓	✓
Oversized gravels crushed	✓	✓	✓	✓
Wash water sent to sedimentation ponds for removal of silt	✓	✓	Replaced by 95% efficiency wash plant fed using recycled water from two large storage tanks, supplemented with make-up water by a groundwater well.	95% efficient wash plant fed using recycled water from two large storage tanks, supplemented with make-up water by a groundwater well.
Fines and silt mechanically dried	X	X	✓ Mixed with organic overburden material and used for construction and progressive reclamation	✓ Mixed with organic overburden material and used for construction and progressive reclamation.

Project Component	Feb 2010	Dec 2011	Sept 2013	Current Proposal
Processed sand and gravel conveyed to stockpile area	✓	✓	✓ Stockpile location and layout designed to mitigate potential operational noise effects.	✓ Stockpile location and layout designed to mitigate potential operational noise effects.
All processing facilities are electric motor driven to limit greenhouse gas (GHG) emissions	✓	✓	✓	✓
Typical hours of operation	12 hrs/day, 260 days/yr	12 hrs/day, 260 days/yr	8 to 10 hrs/day, 260 days/yr during seasonal daylight hours	8 to 10 hrs/day, 260 days/yr (i.e., 5 days/week) during seasonal daylight hours.
Marine Loading Facility and Barging				
Covered above-ground electric conveyor	✓ 1,000 tonnes per hour capacity	✓ 1,000 tonnes per hour capacity	✓ >1,500 tonnes per hour capacity. Exit near mid-point of processing area.	✓ >1,500 tonnes per hour capacity. Exit from south-east corner of processing area, approx. 125 m east of previously proposed location.
Frequency of operations	>300 days/year	>300 days/year	One barge every other day. Barges filled in approx. 2 to 3 hrs during seasonal daylight hours	One barge every other day. Barges filled in approx. 2 to 3 hrs during seasonal daylight hours
Other Facilities, Infrastructure and Alternatives				
Site office and communications building, with offices and boardroom	✓	✓	✓	✓
Workers lunch/dry room	✓	✓	✓	✓
Washroom facilities	✓	✓	✓ Contained	✓ Contained
First aid facility with attendant and helipad	✓	✓	✓	✓
Caretaker's cabin	✓	✓	✓	✓
New floating small craft dock attached to proposed jetty, the with tie-up area for a float plane, serviced with 30 amp (A) 125 volt (V) shore power	✓	✓	✓	✓
Removal of existing small craft dock	✓	✓	✓	✓

Project Component	Feb 2010	Dec 2011	Sept 2013	Current Proposal
Upgrades to an existing marine barge grid and abutment for heavy equipment loading/offloading on site during construction	✓	✓	✓	✓
Removal of the marine barge grid following completion of construction	✓	✓	✓	✓
Upgrades to the existing fuelling facility for the storage of diesel and gasoline for on-site equipment	✓	✓	✓	✓
Upgrades to the existing heavy equipment maintenance shop and warehouse	✓	✓	✓	✓
Electrical substation located adjacent to existing BC Hydro transmission line	✓	✓	✓	✓
Outdoor switchyard, electric building, and 100 m transmission line	✓	✓	✓	✓
Groundwater well as a source of make-up water for the processing plant	✓	✓	✓	✓
Pump room for well/stream intake water distribution and fire-fighting, based on existing water licence	✓	✓	✓	✓
Sewage and stormwater treatment facility	✓	✓	X	X
Site and navigational lighting, where required	✓	✓	✓	✓
Trench drains, catch-basins and manholes directed to a retention pond or water treatment and recycling plant	✓	✓	X	X
Short term portable concrete batch plant for project facilities during the construction phases.	✓	✓	✓	✓

Project Component	Feb 2010	Dec 2011	Sept 2013	Current Proposal
Project Emissions, Discharges and Waste				
Operational conditions limit atmospheric emissions	✓	✓	✓	✓
Electric motor driven facilities limit GHG emissions	✓	✓	✓	✓
Marine dredging or disposal	X	X	X	X
Sewage disposal	✓	✓	X Liquid waste pumped from washroom facilities will be barged off-site	X Liquid waste pumped from washroom facilities will be barged off-site
Household and industrial solid waste barged off-site	✓	✓	✓	✓
Reclamation, Closure and Monitoring				
Progressive Reclamation using overburden	✓	✓	✓	✓
Ground and surface water-fed lake	✓	✓	✓	✓
Environmental monitoring and follow-up program	✓	✓	✓	✓
Labour				
Construction	80 person years	80 person years	80 person years	80 person years
Operation	60 person years	360 person years	360 person years	360 person years
Cost				
Capital Cost	<$60M	<$60M	$40M	$40M
Operational Cost	Not specified	Not specified	$16M per year	$13M per year

2.5.1.1 Aggregate Pit Development

Sand and gravel will be extracted from the pit using an electric powered floating clamshell dredge equipped with a primary crusher linked to a floating conveyor system. This equipment will be initially placed on the western area of the deposit and will dig downward to form a wetted pit (filled with natural groundwater input). The electric powered dredge will float on the surface of the pit pond. From this location, it will be used to extract material based on the aggregate deposit and mine plan, and is anticipated to gradually enlarge the pit pond to phase 10 to an approximate size of 30 ha. A electric powered floating clamshell dredge will be used to extract sand and gravel because portions of the gravel deposit extend to approximately >30 m below the surface in some locations into areas below the groundwater table. No pit dewatering will be undertaken, and no explosives will be used.

Figure 2-2 shows the mine plan that is proposed for the site. This mine plan envisions gradual extraction of the aggregate materials over a 16-year period using a "wet extraction" method. That is, aggregate would be extracted subaqueously without dewatering of the aggregate pit, thus allowing gradual formation of a pit lake as the mining progresses. In the mine plan aggregate extraction would start in the southwest portion of the site and would progress east and then north.

A proposed wetted pit development schedule is provided in Table 2-9, including estimated material volumes. An assumed density of 2,100 kg/m^3 is used for conversion between mass and volume. It is also assumed that 60% of the aggregate will be washed and that 5% of the wash plant output will be generated as fines.

Table 2-9: BURNCO Aggregate Project: Proposed Pit Development Schedule

Year	Phase	Area (m^2)	Surface Soil Volume (m^3)	Aggregate Volume (m^3)	Aggregate Quantity(t)	Washed Fines Volume (m^3)
1	1	9,401	7,441	476,190	1,000,000	20,000
2	2	17,839	14,119	476,190	1,000,000	20,000
3	3	24,256	19,198	476,190	1,000,000	20,000
4	4	13,308	10,533	476,190	1,000,000	20,000
5	5	15,328	12,132	476,190	1,000,000	20,000
6	6	14,634	11,583	476,190	1,000,000	20,000
7	6	14,634	11,583	476,190	1,000,000	20,000
8	7	17,492	13,845	476,190	1,000,000	20,000
9	7	17,492	13,845	476,190	1,000,000	20,000
10	7	17,492	13,845	476,190	1,000,000	20,000
11	8	25,455	20,147	476,190	1,000,000	20,000
12	8	25,455	20,147	476,190	1,000,000	20,000
13	9	16,530	13,083	476,190	1,000,000	20,000
14	9	16,530	13,083	476,190	1,000,000	20,000
15	9	16,530	13,083	476,190	1,000,000	20,000
16	10	22,659	17,934	476,190	1,000,000	20,000
End.	**Total**	**285,035**	**225,600**	**7,619,048**	**16,000,000**	**320,000**

Cross-sections and details showing the planned pit excavation and components of pit development are shown in Volume 2, Part B – Section 5.4: Figures 5.4-10 to 5.4-12. The mining operation will generally consist of the following:

- The pit, processing, soil storage and berm areas will be cleared of trees. Merchantable timber will be salvaged.
- Topsoil and subsoil will be stripped, salvaged and stockpiled separately. Stockpiles will be trimmed to 3H:1V side slopes and approximately 5 m maximum height so they remain stable until after reclamation is completed. An erosion control plan will be developed and implemented for soil salvage and overburden removal is conducted. An Erosion and Sediment Control Plan and a Reclamation and Effective Closure Plan are provided in Volume 4, Part G – Section 22.0: Appendix 3 and Appendix 4 respectively.
- Excavation of gravel *above* the natural groundwater level will typically be achieved using a front-end loader or hoe excavator. A temporary/portable gravel processing system will be operated within the pit footprint area.

- Aggregate (sand and gravel) *below* the natural groundwater level will be excavated from the wetted pit (i.e., filled with natural groundwater input) using an electric powered floating clamshell dredge equipped with a primary crusher linked to a floating conveyor system. The electric powered dredge will float on the surface of the wetted pit. Starting along the western edge of the deposit, the floating clamshell will extract material in accordance with the proposed 10-phase mine plan. The wetted pit will gradually enlarge to an area of approximately 28 ha in year 16 of the Proposed Project. No pit dewatering will be undertaken, and no explosives will be used.

At the end of mining, the wetted pit would have horizontal dimensions of approximately 600 m in the east-west direction and 500 m in the north-south direction, with the pit bottom at -35 m elevation.

A portion of the constructed artificial groundwater-fed watercourse (WC 2) currently in the centre of the Property, serves as a “French drain” that lowers the overall level of the water table within the lower Property area. In the first year of mining, the portion of the WC 2 within the ultimate outline of the aggregate pit would be de-activated by constructing a plug immediately downgradient of the pit. This will enable the pit lake groundwater recharge to re-establish and maintain natural groundwater to levels. The loss of WC 2 within the Proposed Project footprint will be offset by the construction of a new groundwater-fed watercourse extension (approx. 780 m in length at closure) in the foreshore area south of the pit and east of the processing area. The new watercourse will connect to the WC 2 below the plug. At closure, a spillway will be constructed above the extension where it connects to the Pit Lake Flood Control Berm at the southern margin of the pit lake. The spillway will be designed to manage the pit water level as well as to enable the pit to overflow during high precipitation events. The outlet structure will also enable the release maintenance flows if needed to benefit the function of the fish habitat provided by the extension. A conceptual design of the plug and extension are provided in Volume 4, Part G – Section 22.0: Appendix 5.1-B.

The final geometry of the slope/pit, including side slope angles and typical sections through the pit lake are illustrated in Volume 2, Part B – Section 5.4: Figures 5.4-10 to 5.4-12. A conceptual design for the berm upgrades (including a typical section through the berm) are also provided. The mine plan will be developed in accordance with the Health Safety and Reclamation Code for Mines in BC.

Proposed setbacks from the from the pit crest to the base of surrounding berms range from 6 m on the east edge of the pit lake to 30 m on the south edge of the pit lake. Proposed setbacks for the berms north of the pit lake range from 100 m to over 300 m. Infrastructure utilized by mine personnel is generally located beyond these surrounding berms.

A geotechnical stability analysis of the pit slopes is provided in Volume 4 – Section 22: Appendix 5.4-Q. The minimum calculated Factor of Safety for shallow failure surfaces as well as deep seated failure surfaces was determined for the pit slope with and without surcharge loading from a structure similar to the proposed north flood control berm. Pit lake water levels of 4.0 and 6.3 m asl were analyzed. The presumed berm load was placed immediately adjacent to the crest of the pit slope to assess the minimum recommended offset of infrastructure from the pit edge. The results of the stability analysis are provided in Table 2-10.

Table 2-10: BURNCO Aggregate Project: Summary of Pit Slope Stability Analysis Results

Pit Slope Model	Pit Lake Water Level (m asl)	Minimum Calculated Factor of Safety	
		Shallow Failure	Deep Seated Failure
Pit Slope only (no surcharge)	4.0	1.5	2.2
	6.3	1.5	2.3
Pit Slope with berm immediately adjacent to slope crest	4.0	1.4	1.8
	6.3	1.4	1.8
Pit Slope with berm 7 m from slope crest	4.0	1.5	1.8
	6.3	1.5	1.9

In general, a minimum calculated Factor of Safety (FoS) of 1.5 is considered suitable for long-term stability; a minimum calculated FoS of 1.3 is considered suitable for short term or temporary conditions. Based on this, the minimum calculated FoS for the overall pit slopes is considered adequate for long-term stability. With surcharge loading immediately adjacent to the slope crest, the minimum calculated factor of safety is reduced to less than the generally desired long-term factor of safety.

2.5.1.2 McNab Creek Flood Control Dyke and Fines Storage Area

The existing logging road and berm network running parallel to McNab Creek at the north end of the proposed pit will be used as a hydraulic flood control dyke in later stages of the Proposed Project. DFO developed the road in 2001 and 2002 into the current berm by adding material to increase width and elevation. The berm will be extended and built into a dyke to limit potential flood events and removed potential risk of avulsion from the north into the Proposed Project Area. A Fines Storage Area will be developed adjacent to the northern flood control dyke for the disposal of mechanically dried fines and silt from wash plant process water. The fines will be progressively revegetated and reclaimed using organic overburden material.

A southern Pit Lake Containment Berm will also be constructed along the southern and south-eastern portions of the pit lake. Material for construction of the Pit Lake Containment Berm will be excavated from Phase 1 of the pit area. The berm will also control surface drainage and minimize the risk of concentrated overland flow from the aggregate pit due to high water levels, wind setup and wave action.

2.5.1.3 Existing Site Conditions and Pit Lake Containment Berm

Along the south perimeter of the aggregate pit, existing ground surface varies from approximately 5.5 to 7.0 m elevation based on current topographic mapping. Based on provision for 1.0 m above the 200 year water level of 6.2 m, the crest of the Pit Lake Containment Berm will be 7.2 m, with a width of 20 to 25 m (based on scaling of drawing), north of and parallel to the existing transmission line corridor as illustrated in Figure 2-7. The centreline of the containment berm is approximately 45 m from the crest of the aggregate pit slope.

The upper portion (Phase 3) of the existing groundwater-fed watercourse (WC 2) is located within the footprint of the aggregate pit and extends south across the proposed containment berm and transmission line alignment, discharging into the middle portion (Phase 2) of WC 2 to the south of the existing gravel roadway. The base of this watercourse is considered to be 1.5 to 2.0 m, based on the site topography.

2.5.1.4 WC 2 Infill

As described above, considering the 200 year aggregate pit water level to be 6.2 m elevation, the maximum difference in head between the pit water level and WC 2 to the south of the containment berm is 4.7 m. To minimize the risk of excessive seepage flows and potential piping or internal erosion, it is recommended that all loosened or disturbed materials on the bottom and side slopes of the WC 2 be stripped, and that well-graded sand and gravel that contain no organics or coarse sizes (i.e., greater than 300 mm diameter) be placed and compacted to plug WC 2 over a length of at least 35 m, to achieve a hydraulic gradient of 0.15 or less. It is also recommended that the infill zone extend at least 5 m upstream and downstream beyond the crest of containment berm, and that the crest elevation of the upstream be 7.2 m (i.e., similar to that of the berm) to minimize the risk of overtopping and erosion during high water and wave run-up conditions. It is also recommended that the crest of the infill zone downstream (south) of the containment berm be constructed to at least the same elevation as the adjacent terrain to reduce the risk of erosion due to surface runoff flows.

To further reduce the potential risk of concentrated seepage flow and internal erosion of the infill zone, as well as possible surface erosion or scour of the upstream and downstream end slopes of the infill zone, it is recommended that consideration be given to the installation of a riprap and filter layer, together with use of 2 horizontal to 1 vertical (2H:1V) slopes.

A conceptual design for the McNab Creek Flood Protection Dyke, the Fines Storage Area and the Pit Lake Containment Berm (including typical sections) are provided in Figure 2-7 and Figure 2-8.

2.5.1.5 Soil Storage Areas

Surface soil that is not suitable for the base of the McNab Creek Flood Protection Dyke and surface soil within the Fines Storage Area will be salvaged and placed in two temporary stockpiles along the northern side of the soil deposit area (i.e., adjacent to the Fines Storage Area). Where feasible, soil will be salvaged in two lifts, topsoil and subsoil. Topsoil will be stored in a more southerly stockpile and subsoil will be stored in a more northerly stockpile just inside the soil deposit area. Topsoil will be salvaged from the subsoil stockpile area and placed in the topsoil stockpile before stockpiling subsoil. These stockpiles will be covered or vegetated for erosion control. These soils will be used as cover for the dyke, berms and fines.

Surface soil from the Pit Lake Containment Berm area will be salvaged and placed to the north, between the berm and the pit area. This area is to be reclaimed as riparian area or forest. This stockpiled soil will be used to cover the berm after construction, and if excess soil is available, left in the riparian/forest area. The stockpiled soil will be covered or vegetated until final placement to protect against erosion. Details regarding the soil stockpiling is provided in detail in the Reclamation and Effective Closure Plan in Volume 4, Part G – Section 22.0: Appendix 4.

2.5.1.6 Processing

The processing plant will be located in an approximately 4 ha site, preloaded above the pit elevation to enhance water recycling process and drainage. The plant will be situated in the south-western corner of the Property outside of existing mature forests and outside of setbacks from watercourses and marine foreshore areas. An existing treed buffer up to approximately 50 m wide will be maintained between the processing area and the marine foreshore to limit potential visual, noise, dust and emission effects on the environment.

Processing of the dredged aggregate material will involve screening the fines from the gravel and further screening to separate the different aggregate material sizes. Oversize materials will be crushed. The sand will be sized, washed and dewatered to remove silt-sized fractions. Wash water will be recycled (described below). Processing is expected have the effect of improving physical quality, reducing the organic impurities content and averaging the physical properties as influenced by varying degrees of weathering at different depths.

The electric powered floating clamshell dredge and processing plant will be active 8 to 10 hours per day, five days per week during seasonal daylight hours. The processed sand and gravel products will be conveyed to individual product stockpiles prior to loading onto barges (Figure 2-3). The anticipated heights, volumes, and slope angles for proposed stockpiles of processed material are presented in Table 2-11. Cross section drawings of these stockpiles are provided in Figure 2-8. Temporary fines storage will be within a covered facility adjacent to the wash plant.

Table 2-11: Processing Area Stockpile Descriptions

No.	Description	Max Mass of Pile (t)	Surface Area (m^2)	Height (m)	Slope (º)
1	Surge Pile, 150mm Crushed Gravel	44,100	5,332	14	34.3
2	Material Storage, 20mm Crushed Gravel	55,500	6,587	14	34.3
3	Material Storage, 25mm Crushed Rock	21,200	4,638	19.3	37.3
4	Material Storage, 10mm Crushed Gravel	21,200	4,638	19.3	37.3
5	Material Storage, 5mm Concrete Sand	35,100	6,675	19.3	37.3
6	Material Storage, 14mm Washed Rock	21,200	4,638	19.3	37.3
7	Material Storage, 20mm Washed Rock	21,200	4,638	19.3	37.3
8	Material Storage, 10mm Washed Rock	21,200	4,638	19.3	37.3

The nature of extraction and processing at the Property, coupled with the availability of electricity from the BC Hydro 138kV transmission line, will allow the use of electric motor-driven systems for processing to limit greenhouse gas emissions from the Proposed Project. A sub-station will be constructed to convert power from 138kV to 575V (3 phase).

An electric conveyor will move material from each stockpile to a covered electric barge conveyor using an automated materials-handling system connected under each stockpile (i.e., reclaim tunnels). The materials-handling system will be used to limit power use, multiple handling of materials, emissions, dust and noise. Crushing, screening and washing facilities will be enclosed above ground in the Proponent's proprietary enclosures to avoid and limit fugitive dust and noise emissions.

Project-related water use will be limited to a 95% efficient wash plant and emergency use for fire suppression. The wash plant will use approximately 110 litres per second (1,450 gpm), of which 106 litres (3,052,800 to 3,816,000 litres per day[6]) will be recycled water supplied from two large storage tanks. The 5% loss (via retention, evaporation and absorption; 4 litres per second 50 gpm or 115,200 to 144,000 litres per day[2]) will be supplemented with make-up water by a groundwater well. The recycled wash water will be processed, screened and pressed to remove the sediment. Fines and silt will be mechanically dried and disposed of in the Fines Storage Area. No wash water will be discharged. Figure 2-9 provides a depiction of the Proposed Project wash water cycle.

The surficial soils are highly permeable; the primary approach to storm water management is collection and infiltration. No point source discharges of surface water are proposed. Within the processing area, water will be recycled; process water will not be discharged.

Surface water runoff from slopes above the western portion of the Proposed Project Area will be collected in the existing ditch and will not reach the soil management sites. On-site run-off will be directed away from the stockpile, dyke and berm areas and collected within the Proposed Project Area. If needed, excess storm water will be pumped to either the wash plant water storage tanks or into the pit lake.

2.5.1.7 Marine Loading Facility and Barging

The marine loading facility will be designed to accommodate up to two 5,500 deadweight tonnage (DWT) barges (80 m in length, draught 4.5 m). The location of the barge loading facility and jetty has been proposed within the existing water lease and log dump area (Figure 2-3), outside the intertidal foreshore. During moorage or loading all portions of the barge and associated vessels will be within the boundaries of the water lease. The barge loading facility and jetty will include a new crew and boat docking facilities, and a security gate. The existing western dock will be removed. Access to the dock through the gate will permitted as requested. A fixed walkway will be directed to the proposed upgraded warehouse facilities.

The barge loading facility and jetty will consist of an electric covered conveyor with a capacity of >1,500 tonnes aggregate per hour. The barge will tied against a series of steel pilings spaced perpendicularly to the foreshore. The barge will be slowly moved laterally to fill. The loading facility will be fed by covered above-ground conveyor

[6] Based on typical hours of operation (8 to 10 hours/day)

supported by steel piles in the foreshore over a length of approximately 150 m. The land-based conveyor will connect the processing area and the barge loader will be supported on six ties and sleeper foundations on the ground surface over a length of approximately 190 m. Barges will be filled in approximately two to three hours during seasonal daylight hours.

The bathymetry of the near shore marine environment in the area of the proposed marine loading facility and jetty will not require dredging, so assessment of marine dredging or marine disposal of dredgeate will not be a part of the Proposed Project. In addition, no explosive use is planned.

During operation, an empty barge will be delivered by tug boat and tied to one end of the jetty approximately once every other day. The tug boat(s) will then pick up and transport an aggregate-filled barge for processing.

Filled barges will be towed along two proposed barging routes, navigational channels and shipping traffic lanes from the site through Howe Sound, via Ramillies and / or Thornbrough Channel, and Queen Charlotte Channel to south of Passage Island, at which point they will connect with BURNCO's existing shipping lanes in the Strait of Georgia (Figure 2-4). Filled barges will use the north arm of the Fraser River to deliver material to existing facilities in Burnaby (approximately 59 km away), and the south arm of the Fraser River to deliver to the Proponent's facilities in the Township of Langley (approximately 102 km away). The Proponent presently uses Seaspan tugs and barges to deliver aggregate to existing Proponent facilities from Treat Creek and as far away as Port McNeil (approximately 360 km away). Seaspan and other tug barges, and log booming operators use the Ramillies Channel in Howe Sound, along with the existing shipping routes in the Fraser River to move bulk materials.

2.5.1.8 Other Facilities and Infrastructure

Additional facilities associated with the Proposed Project will include:

- Site office and communications building, with offices and boardroom;
- Workers lunch/dry room;
- Portable washroom facilities;
- First aid facility with attendant and helipad;
- Caretaker's cabin;
- New floating small craft dock attached to proposed jetty, the with tie-up area for a float plane, serviced with 30 amp (A) 125 volt (V) shore power;
- Removal of the existing small craft dock;
- Upgrades to an existing marine barge grid and abutment for heavy equipment loading/offloading on site during construction;
- Removal of the marine barge grid following completion of construction;
- Upgrades to the existing fuelling facility for the storage of diesel and gasoline for on-site equipment;

- Upgrades to the existing heavy equipment maintenance shop and warehouse;
- Electrical substation located adjacent to existing BC Hydro transmission line;
- Outdoor switchyard, electric building, and 100 m transmission line;
- Groundwater well as a source of make-up water for the processing plant;
- Pump room for well/stream intake water distribution and fire-fighting, based on existing water licence;
- Site lighting where required; and
- Short term portable concrete batch plant for Proposed Project facilities during the construction phases.

Supplies on trucks for the Proposed Project will be transported by barge and delivered to the site by way of the existing log dump grid.

2.5.2 Project Emissions, Discharges and Waste

The Proposed Project will be constructed and operated to avoid, limit and mitigate emissions, discharges and wastes as follows:

- Aggregate is a benign material and not involve chemical treatment for extraction;
- Atmospheric contamination (dust) will be minimized during Proposed Project operation through extraction of the aggregate resource under wet conditions using an electric powered floating clamshell dredge. Processing facilities will be fully enclosed, including transfer points, and operated under wet conditions (fine water spray) to avoid and limit dust;
- The use of electrically powered equipment to extract, process and load the aggregate resource will avoid and limit the amount of exhaust emissions related to burning fossil fuel during aggregate extraction;
- The proximity of the Proposed Project site to the Proponent's markets in the Lower Mainland is also intended to reduce barging distance relative to present aggregate barging and; therefore, minimize exhaust emissions related to transportation of the aggregate products to market;
- Wash water will be processed for removal of fines and silt in a 95% efficient wash plant to be fed using recycled water from two large storage tanks. The 5% loss (via retention, evaporation and infiltration) will be supplemented with make-up water by a groundwater well. No wash water will be discharged.
- Household waste, industrial solid waste, and liquid waste pumped from portable washroom facilities will be barged off-site and disposed of in approved facilities.

2.5.3 Reclamation, Closure and Monitoring

Progressive and ongoing reclamation activities will occur throughout all phases of mine development. The Proposed Project will use progressive reclamation of the site that includes ongoing reclamation activities taking place alongside active extraction and pit area around the proposed operations area. A Reclamation and Effective Closure Plan is provided in Volume 4, Part G – Section 22.0: Appendix 4. The plan describes the proposed measures and commitments to manage, maintain and monitor water management structures, remove surface facilities, and reclaim areas and develop a functional ecosystem in the freshwater pit.

Site planning will include landscaping, further design and development of the existing berm along the north edge logging road of the pit area, along with the creation of southern pit containment berm, surface water features, fisheries habitats and vegetation throughout the site consistent with the operational extraction schedule. Ongoing monitoring will be conducted for relevant noise and dust, water quality parameters, and fish, vegetation and wildlife resources. Details regarding the monitoring programme (in addition to the reclamation monitoring suggested in the plan) is provided in Volume 3, Part E – Section 17.0.

Soil management procedures, including soil handling and storage, as well as soil monitoring plans are outlined in the Soils Management Plan in the Reclamation and Effective Closure Plan (Volume 4, Part G – Section 22.0: Appendix 4) and the Erosion and Sediment Control Plan (Volume 4, Part G – Section 22.0: Appendix 4).Soil management procedures and monitoring plans will follow accepted guidelines and standard practices as required in Section 10 of the Health and Safety Reclamation Code for Mines in BC.

2.5.3.1 Summary of Environmental Management System

BURNCO's Environmental Management Programme is described in Volume 3, Part E, Section 16.0.

Environment monitoring plans will be developed by qualified environmental professionals and implemented to achieve compliance with the EAC Conditions and with terms and conditions of regulatory permits and approvals. Monitoring will consist of two main components: compliance monitoring and effects monitoring.

Compliance monitoring will occur during all phases of Proposed Project activities as a part of the Proposed Project construction and operational EPPs. Compliance monitoring will include assessment of Proponent and contractors' environmental performance using specifically developed performance indicators and benchmarks. Where possible, an adaptive management approach will be used to modify management plans as needed based on the results of the monitoring program. Monitoring programmes provide an opportunity for local community members and First Nations groups to be involved in the development and implementation of monitoring initiatives. This will be clearly defined within the final monitoring framework.

Effects monitoring will include periodic sampling or studies on/of groundwater, vegetation, wildlife, fish, air quality, surface water and aquatic health. The studies will be conducted with a Proposed Project study area (receiving environment) and a reference area. Monitoring plans will establish timelines and schedule for each monitoring activity (e.g., give years for post-construction monitoring). Monitoring data will be assessed against Proposed Project-specific guidelines which will be developed based on Canadian and BC guidelines and baseline benchmarks.

Programmes may commence during construction, operations or reclamation phase of the Proposed Project. The schedule and length of the programme will be provided as the framework is developed. Some additional monitoring programmes may be suggested after the Proposed Project has commenced. Adaptive management techniques will be applied to all monitoring programmes.

2.5.3.2 Sustainable Development Framework

BURNCO will support sustainable development of the Proposed Project by designing, constructing, operating, and reclaiming the Proposed Project by incorporating the following practices:

- Environmental Sustainability:
  - A contained footprint and aggregate pit closure plan that limits residual effects on soils, vegetation and plants, wildlife, aquatic resources, fish communities and fish habitats;
  - A reduced environmental footprint through use of a shortened aggregate barging route from source to processing facilities;
  - Water recycling process;
  - Progressive reclamation of the aggregate pit site at project closure, including removal of infrastructure that is not essential for post-closure management and monitoring and returning disturbed land to its previous use where possible;
  - Use of electrical power;
  - Management of lands not involved in aggregate pit site as private forest lands, and accommodation of other industrial or transportation uses or needs of neighbouring property owners; and,
  - Management and long-term stewardship for forest, fisheries, wildlife and water resources on the property.
- Economic Sustainability:
  - Maximizing employment and business opportunities, and associated income benefits to local communities though hiring of appropriately skilled personnel;
  - Adding economic diversity to the local and regional economy and increase government revenues (taxes, fees), especially when the aggregate pit is in full operation to supply demands for sand and gravel to BURNCO's plants in Metro Vancouver; and,
  - While aggregate pit closure will conclude direct and indirect economic benefits, the Reclamation and Effective Closure Plan developed by BURNCO in conjunction with communities and First Nations to will minimize adverse effects by providing opportunities to upgrade skills, working with other regional employers to find replacement jobs and identifying new opportunities for economic development.
- Social Sustainability:
  - Supporting individual capacity and skill development (including transferable skills) through training, potentially prioritized for local residents and First Nations;

- Supporting local business capacity such that their skill base is strengthened and can be applied elsewhere in the economy (i.e., supporting longer term economic diversification and stability); and,
- Supporting First Nations' sustainable development goals through consultation processes.

- Cultural Sustainability:
  - Preserving cultural heritage and any structure or site that is of archaeological significance; and,
  - Maintenance of access to traditional territories and accommodation of traditional culture and customs in the Proposed Project Area.

2.5.4 Labour

The Proposed Project is expected to provide approximately 80 person-years of direct employment during the construction phase, and approximately 360 person-years of employment over during a 16-year the operations phase. The Proposed Project is expected to provide at least 12 full-time (40 hour work-week) jobs, 2 part- time jobs (20 hour work-week) for mine pit operations on-site and 4 full-time direct jobs for transportation and distribution of aggregate resources to the Proponent's operating facilities. Table 2-12 presents a summary of the types of the jobs that will be created and the skills and experience that would typically be required.

Table 2-12: Summary of Project-related Jobs, Skills and Experience

Type of Job	Skill Required	Experience Required
Mine Manager	Mines certification, rescue	5-10 years preferred
Plant operators	Machine specific training	5 years crushing/washing
Heavy equipment operators	Machine specific training	5 years
Millwright	Apprentice and Red Seal	5 years
Heavy duty mechanic	Red Seal	5 years
Safety/Environmental/QA	OH&S certification, specific training	None required
Labourers	Site specific orientation	None required
Administration	Site specific orientation	None required

Indirect jobs will include:

- Tug and barge operators;
- Material offloading;
- Sales and administration;
- Environmental monitoring;
- Engineering/Surveying;
- Transportation/Lodging;
- Machinery and materials suppliers;

- Contractors for site civil works, stripping, reclamation, etc.;
- Lab work for QA and testing; and
- Freight and delivery.

Table 2-13 and Table 2-14 summarize the estimated number of jobs created by the Proposed Project during the construction and operations phase. See Volume 2, Part B - Section 6.1 (Sustainable Economy) for additional details regarding Proposed Project related jobs.

It is expected that transport of employees traveling to and from the work site, and delivery of essential equipment and materials, such as fuel and parts, will be by boat, barge, and or water taxi from Gibson's and/or Horseshoe Bay. The nearby communities (e.g., Squamish, Gibson's, and West Vancouver) have available temporary accommodation to meet all requirements during construction. Therefore, the Proponent does not anticipate the need to provide a construction camp on the site, or any other residential facilities at any time with the exception of a caretaker's cabin for security and facility care.

Table 2-13: Estimated Employment (No. of Jobs), Construction Phase

	Direct	Indirect		Induced		Total employment	
Area	LSA	LSA	Total B.C.	LSA	Total B.C.	LSA	Total B.C.
Employment	40 (located in LSA) 26 (filled by LSA residents)	5	65	4	14	49 (located in LSA) 35 (filled by LSA residents)	119

Source: Author's calculations and British Columbia Input-Output Model customized simulation conducted by B.C. Stats (B.C. Stats 2013b).
Note: Assumes a social safety net is in place.

Table 2-14: Estimated Annual Employment (No. of Jobs), Operation Phase

	Direct	Indirect		Induced		Total employment	
Area	LSA	LSA	Total B.C.	LSA	Total B.C.	LSA	Total B.C.
Employment	14 (located in LSA) 12 (filled by LSA residents)	16	70	5	15	33	99

Source: Author's calculations and British Columbia Input-Output Model customized simulation conducted by B.C. Stats (B.C. Stats 2013b).
Note: Assumes a social safety net is in place.

2.5.5 Costs

The Proposed Project would have a positive effect on the local and B.C. economy, increasing the demand for goods, services and labour and generating tax revenue for all levels of government. During construction, total

expenditures on goods and services by BURNCO are expected to be $21.5 million[7]. Total direct expenditures from the Proposed Project accruing to suppliers of B.C. produced goods and services would be approximately $8.3 million during construction, and approximately $13.0 million per year during operations. In total, there would be close to $170 million in direct spending on materials, goods and services produced in B.C.

2.6 Provincial Scope of Proposed Project and Scope of the Assessment

The Provincial scope of the Proposed Project, as defined by section 3.1 of the Section 11 Order dated June 1, 2010, consists of the following on-site and off-site components and activities:

- The development of a sand and gravel pit with proposed production volumes of up to 1.6 million tonnes per annum and including the following facilities:
  - A processing plant
  - Stockpiles
  - Dredging equipment
  - A marine loading facility; and
  - Other buildings and facilities, including a site office, washrooms, first aid facility and helipad, caretaker's cabin and a small craft dock with a tie up for a float plane.

On December 5, 2013, the Provincial scope of the Proposed Project was amended to also include:

- Proposed barging routes as indicated in Figure 2-4.

The Provincial scope of the assessment for the Proposed Project, as defined by section 4.1 of the Section 11 Order dated June 1, 2010, includes consideration of:

- Potential adverse environmental, social, economic, health and heritage effects, and practical means to prevent or reduce to an acceptable level any such potential adverse effects; and
- Potential adverse effects on First Nations' Aboriginal interests, and, to the extent appropriate, ways to avoid, mitigate or otherwise accommodate such potential adverse effects.

The Approved AIR/EIS Guidelines issued December 16, 2014 reflect the Provincial scope of the Proposed Project and scope of the assessment described above.

[7] Estimates of Project spending and revenues of suppliers are presented in 2012 constant dollars.

2.7 Federal Scope of Proposed Project and Scope of the Assessment

The federal scope of the proposed project consists of the construction, operating and decommissioning of the following on-site and off-site components[8]:

- Aggregate pit development with proposed production volumes of up to 1.5 million tonnes per annum;
- A processing plant;
- Marine loading facility;
- Shipping; and
- Reclamation, closure and monitoring.

The scope of assessment of the marine shipping component of the Proposed Project consists of the barge traffic in Howe Sound, Ramillies Channel, Thornbrough Channel, and Queen Charlotte Channel to south of Passage Island (Figure 2-4). The scope does not include shipping from where the barges meet the existing shipping lanes in the Strait of Georgia and in the Fraser River to BURNCO's existing facilities in Burnaby and Langley (CEA Agency 2013).

The Federal scope of the assessment for the Proposed Project, and the process that led to its development, is described below. All federal assessment requirements for the Proposed Project are provided in Volume 3, Part D – Section 15.0.

- Based on the Project Description submitted by the Proponent, the CEA Agency determined that a comprehensive study-type EA would be required. Details on the Proposed Project's history in the federal EA review process and how the Proposed Project is subject to the former CEAA is provided in Section 3.1.3.
- The federal comprehensive EA study review process was initiated on April 28, 2010 when the Notice of Commencement for the BURNCO Aggregate Mine Project EA was posted to the Canadian Environmental Assessment Registry (CEAR). Subsequently on July 12, 2010, a series of amendments to the CEAA came into force. As a result of these amendments, three operational items regarding the BURNCO Aggregate Mine Project EA process changed:
  - The CEA Agency became a responsible authority (RA) for the Project;
  - The comprehensive study would continue under the former CEAA but a comprehensive study report must be provided to the Minister no later than six months of government time after CEAA 2012 comes into force; and
  - The CEA Agency was now required to provide the public with the opportunity to comment on the Project and the conduct of the comprehensive study.

[8] Background Document supporting Public Participation Opportunity #1 in accordance with the Canadian Environmental Assessment Act. Prepared by Canadian Environmental Assessment Agency. Canadian Environmental Assessment Registry Reference Number: 11-03-54754.

- On January 3, 2012 an updated Notice of Commencement was posted on the CEAR which started a 30-day public consultation process. The CEA Agency provided the public with a summary document (CEA Agency 2012) outlining the proposed scope of the potential environmental effects to be considered for the federal portion of the EA as per Section 16 (1) of the former CEAA. The proposed federal scope of factors that will be considered as described in the CEA Agency 2012 document are:
  - Any change that the Proposed Project may cause to the following Valued Environmental Components:
    - Environmental conditions including climate;
    - Surface water quality and quantity;
    - Groundwater quality;
    - Hydrogeology;
    - Air quality (dustfall and particulate matter);
    - Soils, including terrain and geology;
    - Mammals and their habitat;
    - Migratory birds, raptors, bats and their habitats;
    - Vegetation;
    - Fish populations and fish habitat;
    - Amphibians;
    - Terrestrial invertebrates;
    - Rare and sensitive ecological communities including wetlands; and
    - Species at risk, its critical habitat or residences as defined in the Species at Risk Act.
  - The effect of any change to the environment on:
    - Human health (for example from changes to air quality, noise and vibration, water quality, light, country foods);
    - Local and regional socio-economic conditions;
    - Physical and cultural heritage; and
    - Archaeological, historical, paleontological or architectural resources including structures and sites of significance.
  - Any change that the Proposed Project may cause to the following Other Factors and Relevant Matters:

- Cumulative environmental effects that are likely to result from the residual impacts from the Proposed Project (that remain after the implementation of mitigation measures) in combination with other projects or activities that have been or will be carried out;
- Environmental effects from accidents and malfunctions;
- Capacity of renewable resources that are likely to be significantly affected by the Proposed Project to meet the needs of the present and those of the future;
- Current use of lands and resources for traditional purposes by Aboriginal persons;
- Change to the Proposed Project that may be caused by the environment (i.e., natural hazards, seismic events, extreme weather events);
- The need for and purpose of the Proposed Project;
- Alternative means of carrying out the Proposed Project; and
- The need for and the requirements of any follow-up program.

- In addition, under Section 16 (2) of the former CEAA all comprehensive study-type EAs must consider:
  - The significance of the environmental effects of the Proposed Project;
  - Comments from the public that are received in accordance with the CEAA and regulations; and
  - Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Proposed Project.

The Approved AIR/EIS Guidelines issued December 16, 2014 reflect the Federal scope of the Proposed Project and scope of the assessment described above.

2.8 Alternate Means and Alternatives to Undertaking the Proposed Project

The EA process provides an opportunity to describe the design evolution of the Proposed Project as well as alternative development options that have been considered, specifically with respect to the environmental and social effects, before a final decision is taken on the design.

The assessment of alternatives to the Proposed Project has been undertaken pursuant to Section 19 (g) of CEAA 2012 with guidance from CEAAs Operational Policy Statement (1998 as amended) and has specifically addressed the following:

- “alternatives to” the Proposed Project; and
- “alternative means” of carrying out the Proposed Project that are technically and economically feasible and the environmental effects of any such alternative means.

As EA is an iterative process the Proponent will continue to refine the design of the Proposed Project based on input received during the EAC Application/EIS review and advancements in engineering design and Proposed Project economics.

2.8.1 Alternatives to the Proposed Project

This section presents and compares potential alternatives for meeting the need for increased aggregate material from BURNCO' existing facilities and includes the following options:

- Option 1: Do Nothing Alternative; and
- Option 2: Alternative Suppliers of Aggregate Material.

2.8.1.1 Option 1: Do Nothing Alternative

Option 1: Do Nothing Alternative to the Proposed Project refers to the option of withholding the future development of an aggregate mine and not identifying a further source of aggregate material for BURNCO's existing facilities.

Growing economic development in the BC Lower Mainland (Lower Mainland) has led to a subsequent demand for sand and aggregate material (which is used in construction products such as concrete) for residential, commercial and infrastructure developments. The British Columbia Stone Sand and Gravel Association (2012) estimate that approximately 50,000,000 metric tonnes of aggregate are required in BC every year. As more aggregate material has been exploited over recent years there has been a decline in available supplies in the BC Lower Mainland (Hickin et al. 2000). Therefore there is a need for reliable aggregate supplies in close proximity to the Lower Mainland.

BURNCO require a reliable supply of specialized aggregates to meet demand for their construction operations in the Lower Mainland. BURNCO's concrete plants in the Lower Mainland are currently supplied with aggregate material from a combination of the following locations

- Polaris Material Corp.'s Orca Quarry at Port McNeil located on northern Vancouver Island, BC;
- Jack Cewe Ltd.'s Treat Creek Operations located in Jervis Inlet, BC; and
- Construction Aggregates Ltd.'s gravel mine located in Sechelt, BC

A further source of aggregate material is required to ensure the reliability of supply.

The Do Nothing Alternative does not result in the anticipated environmental benefits of significantly reducing the towing/barging distance compared to current operations. Moreover, the Do Nothing Alternative does not meet the increasing demand for aggregate material driven by economic development. As such, this alternative would affect the economic sustainability of BURNCO as a construction company and has not been considered further.

2.8.1.2 Option 2: Alternative Suppliers of Aggregate Material

BURNCO currently sources aggregate material for their existing facilities in Langley and Burnaby from a combination of the following locations:

- Polaris Material Corp.'s Orca Quarry at Port McNeil located on northern Vancouver Island, BC;
- Jack Cewe Ltd.'s Treat Creek Operations located in Jervis Inlet, BC; and
- Construction Aggregates Ltd.'s gravel mine located in Sechelt, BC.

However, to meet growing demand and spread the risk of having only independent suppliers, it would be necessary for BURNCO to identify another source of supply. A review of 30 potential alternative suppliers (shown in Figure 2-5) was undertaken and the limitations of using an alternative supplier were identified below:

- Alternative direct competitor – unlikely to sell aggregate material competitively to BURNCO;
- Material may not meet the quality required for concrete production;
- Concerns over reliability of supply;
- Cross border supply restrictions;
- Inability to supply the volume of material required; and
- Increased road traffic (for sources that are located in the Fraser Valley).

In light of the limitations, securing alternative suppliers is not the preferred long-term option for BURNCO as there is too much uncertainty surrounding the ability to supply aggregate material during times of increased demand, in addition to the inability to control the quality and price of material.

Securing a company-owned supply is important for the company to remain competitive in the current construction market. Furthermore, in the past the company have faced the scenario when they were unable to source sufficient material from existing suppliers to meet operating requirements. This situation threatened the company's commercial viability as well as 90 local jobs. The proximity of good quality aggregate material to existing BURNCO operations is also vital in order for the company to maintain its competitive edge and to ensure the company can respond to growing customer needs. As such this alternative was not considered further.

2.8.2 Alternative Means of Undertaking the Project

Various alternative technically and economically feasible means of undertaking the Proposed Project can be implemented or carried out. As part of this assessment consideration was given to the following alternative means of undertaking the Proposed Project:

- Alternative project locations;

- Alternative transportation options;
- Alternative mine layouts;
- Alternative processing options; and
- Alternative mining options.

In order provide analysis of alternatives the ability of that alternative to meet the performance objectives has been rated according to three performance levels: *Preferred*, *Acceptable* and *Unacceptable*, as defined in Table 2-15. After which, an overall rating using the same three performance levels was then determined for each alternative. The determination of the overall rating was based on a reasoned process, instead of any standardized formulation. However, an *Unacceptable* rating on any of the performance objectives was evaluated to result in an overall rating of Unacceptable.

Table 2-15: Criteria Used in the Review of Alternatives

Performance Objective	Performance Levels		
	Preferred	Acceptable	Unacceptable
Environmental	Minimizes or avoids adverse effects on the natural environment without mitigation	Minimizes adverse effects on the natural environment with mitigation	Likely to cause significant or irreversible effects on the natural environment that cannot reasonably be mitigated
Social	Minimizes or avoids adverse socio-economic effects without mitigation; provides positive benefits	Minimizes adverse socio-economic effects with mitigation	Likely to cause significant adverse socio-economic effects that cannot reasonably be mitigated
Economic	Facilitates a competitive return on investment	Facilitates an acceptable return on investment	Cannot be financially supported by the Proposed Project
Technical	Predictably effective with contingencies if the alternative does not perform as expected	Appears effective based on modeling or theoretical results, and contingencies are available if the alternative fails to perform as expected	Effectiveness appears dubious or relies on unproven technologies

2.8.2.1 Alternative Project Locations

BURNCO undertook a pre-feasibility study to identify potential aggregate mine locations in the Lower Mainland that would be suitable for development based on the following criteria:

i) Proven glacio-fluvial deposits of sand and gravel of quantities that would be commercially viable to extract;

ii) Quality of aggregate material must be suitable for the manufacture of concrete and other aggregate products;

iii) Must be technically feasible to extract the material using established techniques;

iv) Must be able to transport material to existing BURNCO facilities in the Lower Mainland;

v) Limited potential for environmental and social effects; and

vi) Site must be able to be purchased by BURNCO.

Natural aggregates (sand and gravel) are a product of unique geological processes (Langer and Glazmann 1993). This generally restricts the location for potential aggregate deposits to those areas where specific environments of deposition exist (Hickin et al. 2000). Although many ideal landforms such as fan-deltas and glacio-fluvial terraces often contain high quality materials for aggregate production, within deposit variations are common and the influence of local bedrock, topography and complex composite geological histories limit generalizations (Bobrowsky et al. 1996). Additionally, aggregate mine sites are only commercially viable if they are accessible and are in close proximity to the market, based on the availability of suitably economic modes of transportation. The relative mining cost of extracting aggregate material is often low due to comparatively simple extraction methods required, but transportation costs are high.

In consideration of this, the search for alternative locations focused on sites within the Lower Mainland area. The Lower Mainland is heavily populated which has further limited the options for appropriate sites, as any site would need to be in a low density area. Through the pre-feasibility study BURNCO identified that marine-based barging of material would result in reduced environmental effects and be more cost effective compared to road-based transportation. Additionally, it is known within the industry that new, undeveloped aggregate sites proximal to the Vancouver market are depleted, already in production, or have been sterilized by development.

The investigation of potential Proposed Project locations focused on sites that provide for marine transportation. Following a review of the above criteria, the pre-feasibility assessment identified viable Proposed Project locations at Treat Creek and McNab Creek. These locations are presented in Table 2-16 below; Figure 2-5 shows the location of each potential site.

Table 2-16: Alternative Aggregate Mine Locations

Alternative	Location	Coordinates	Distance From Existing BURNCO Facilities
Treat Creek	Jervis Inlet (located approximately 95 km northwest of Vancouver)	-123.874, 49.8422	Langley: 113.6 km Burnaby: 98.2 km
McNab Creek	Howe Sound (located 35 km northwest of Vancouver)	-123.3913, 49.56776	Langley: 67.0 km Burnaby: 51.6 km

An analysis of these alternatives is provided in Table 2-17. McNab Creek was selected as the preferred location as it was the closest geographical alternative to existing markets, the site could be purchased and there were proven reserves of aggregate material in a quantity and quality to make extraction commercially viable and the environmental and social effects of the Proposed Project could be minimized through application of mitigation measures.

Table 2-17: Analysis of Alternative Aggregate Mine Locations

Criteria	Alternative Option	
	Treat Creek	***McNab Creek***
Environmental Effects	**Acceptable:** - Minimizes adverse effects on the natural environment with mitigation - The site can be accessed by marine vessels using established navigational channels	**Acceptable:** - Minimizes adverse effects on the natural environment with mitigation - The site can be accessed by marine vessels using established navigational channels without the need for channel dredging - Closest geographical alternative less effects from transportation
Social Effects	**Acceptable:** - Existing operation minimizes adverse socio-economic effects with mitigation	**Acceptable:** - Minimizes adverse socio-economic effects with mitigation - The site is low density and has had a history of forestry use - Site is in proximity to a limited number of year round residential properties
Cost Effectiveness	**Unacceptable-Acceptable:** - Site not owned by BURNCO - Availability of site and extent of resource depletion unknown - Could potentially facilitate an acceptable return on investment	**Preferred:** - Facilitates a competitive return on investment - The site is owned by BURNCO - Closest geographical option less expensive to transport material than other options
Technical Applicability	**Unacceptable-Acceptable:** - Already in production and extent of resource depletion unknown - Accessibility and quality of resource unknown	**Preferred:** - Technically viable to extract material. - Site has proven high quality geological reserves of sands and gravels in a glacio-fluvial fan-delta deposit
Preferred Option		✔

2.8.2.2 Alternative Transportation Options

Alternative transportation methods that were considered include the following:

- Road transportation;
- Marine transportation; and
- Rail transportation.

Currently, the Property is only accessible by boat, float plane or helicopter. There are historic logging access roads which extend from the Property into McNab valley but most of these were deactivated between 2008 and 2009 by Canfor Ltd under existing obligations. Access roads that are located further up the valley have not been maintained. In order to enable road transportation, access roads would require upgrading to enable access for trucks. The mountainous topography north of the site would be technically challenging and expensive for road

building. The Property could possibly be connected to existing logging roads to the west which could eventually connect to Port Mellon, but this option would still require the barging of material from either Port Mellon or Gibsons to the existing facilities in Langley and Burnaby. To the west, the Property could possibly be connected to existing logging roads which are located close to the historic Woodfibre site; however, this option would also require the construction of new roads connecting these to the McNab Valley.

The mine is projected to produce between 1 and 1.5 million tonnes of processed aggregate material per annum. Transporting material via road links would require approximately 111,111 truck movements per annum (based on an approximate load weighing of 13.5 tonnes) and 427 movements per day (assuming 260 days of operation). This additional truck traffic would lead to increased air, dust and noise emissions. The transportation route from the Property would require transportation through Squamish and North Vancouver to Burnaby and Langley, and the additional truck traffic would contribute to traffic congestion in these areas. Transportation of material via marine barging would create less dust, air and noise emissions when compared to road transportation. This option was also considered to be more cost effective, as less investment in infrastructure (road building) would be required, and maintenance and fuel costs per tonne are considerably less than for road transportation.

Transporting material via rail was also considered as an alternative and a train of 100 railcars could transport approximately 4,000 tonnes of material with similar efficiency to marine barging. However, the nearest existing rail links to the site are located in Squamish approximately 23 km northeast of the Property. Considerable capital investment would be required to construct new rail links from the Property to the existing lines in Squamish and subsequent connections would also be required in Burnaby and Langley to connect with BURNCO facilities there.

Table 2-18 below shows a comparison of the alternative transportation options considered.

Table 2-18: Alternative Transportation Options

Criteria	Alternative Options		
	Road Transportation	**Marine Transportation**	**Rail Transportation**
Environmental Effects	**Acceptable** - Noise, air and dust emissions - Less sustainable form of transportation	**Preferred** - Less environmental noise, air and dust emissions than road transportation	**Preferred** - Less environmental noise, air and dust emissions than road transportation
Social Effects	**Acceptable** - Truck movements may lead to an increase in traffic congestion - Greater safety concerns and potential for accidents	**Preferred** - Marine transportation considered safer than road transportation	**Preferred** - Rail transportation considered safer than road transportation
Cost Effectiveness	**Acceptable** - Extensive road upgrades required - Higher cost per tonne of material transported - Higher maintenance and fuel costs	**Preferred** - Construction of a marine load out required; - More cost efficient option per tonne of material transported - Less barges needed	**Acceptable** - Infrastructure investment required in new rail links

Criteria	Alternative Options		
	Road Transportation	Marine Transportation	Rail Transportation
Technical Applicability	**Acceptable** - May be technically difficult to construct new access roads	**Preferred** - Less infrastructure required	**Acceptable** - May be technically difficult to construct rail links to the Property
Preferred Option		✔	

2.8.2.3 Alternative Mine Layouts

The layout of the Proposed Project has been constrained by geographical, geological, hydrological and technical factors. However, during early prefeasibility planning, three alternative mine layout options were considered (Figure 2-6), these included the following:

- **Area 1** - Encompassing a mine area south and west of McNab Creek of approximately 282,039 m^2;
- **Area 2** - Encompassing a mine area south and west of McNab creek and two additional mine pods to the west of Area 1,with an area of approximately 928,258 m^2; and
- **Area 3** - Encompassing the area north of McNab Creek and Area 1 of approximately 331,499 m^2.

Initial geological investigations identified that Area 1 contained proven deposits of sand and gravel and presented the least technically challenging option. Early geological characterization identified that the the deposit contains at least 51 million tons (30 million m^3) of granular material, of which 77% lie below the water table.

Area 2 was considered as a possible extension to Area 1, but an initial geological investigation identified that deposits were shallow and extraction in this area would not be economically viable. Area 3 was also considered as possible expansion of Area 1 and proven deposits of sand and gravel were identified; however, this option presented access and transportation issues due to the presence of McNab Creek and bank stability issues resulting from the creation of a second lake during extraction. Table 2-19 below shows a comparison of these three options.

Table 2-19: Analysis of Alternative Mine Locations

Criteria	Alternative Options		
	Area 1	***Area 2***	***Area 3***
Environmental Effects	**Acceptable** - Effects can be mitigated	N/A	**Acceptable** - Effects can be mitigated
Social Effects	**Acceptable** - Effects can be mitigated	N/A	**Acceptable** - Effects can be mitigated

Criteria	Alternative Options		
	Area 1	*Area 2*	*Area 3*
Cost Effectiveness	**Preferred** - Easiest access to transport facilities and least expensive	**Unacceptable** - Constrained deposits	**Acceptable** - Limited access due to the presence of McNab Creek - Less cost effective
Technical Applicability	**Preferred** - Technically feasible to 35 m	**Unacceptable** - Constrained deposits	**Acceptable** - Technical feasibility issues related to the creek and bank stability
Preferred Option	✔		

Note: N/A – Not applicable

2.8.2.4 Alternative Processing Options

The alternative processing options considered included the following:

- Installation of processing plant in the southeastern corner of the site;
- Installation of processing plant in the southwestern corner of the site; and
- Offsite processing.

Installation of the processing plant in the southeastern corner of the Property was not considered feasible for environmental, social and economic reasons. The existing area is occupied by mature forest, and an area of approximately 4 ha would require clearing to enable installation of the processing plant. In addition, the area in the southeastern corner is in closer proximity to McNab Creek and sensitive residential receptors. By locating the processing plant in this area there would likely be greater visual, noise, dust and air emission effects and these effects could be better mitigated and the mature forest could be retained through the installation of the processing plant in the southwestern corner of the Property.

Consideration was also given to the option of processing aggregate material off-site at existing BURNCO facilities in Langley and Burnaby. This would involve transporting raw aggregate from the site for crushing and processing to these facilities. Aggregate processing reduces the volume of material that would require transportation; thus, more barges or trucks would be required to process material offsite. As such, this option was considered less feasible as transportation costs and noise, dust and air emissions would be higher with this option when compared to onsite processing. Additionally processing of aggregate material in an urban setting may led to the disruption of more sensitive receptors.

Table 2-20 below shows a comparison of the alternative layout options considered and the preferred option of installing processing plant in the south-western corner of the site.

Table 2-20: Alternative Processing Options

Criteria	Alternative Options		
	Southeastern corner	***Southwestern corner***	***Process material off-site***
Environmental Effects	**Acceptable** - Removal of mature forest - Closer proximity to the creek	**Preferred** - Area already cleared - Further setback from watercourse	N/A
Social Effects	**Acceptable** - Greater Noise effects on receptors - Greater dust effects on receptors	**Preferred** - Area further from receptors when compared to other options	N/A
Cost Effectiveness	**Acceptable** - Higher costs to install mitigation and extra conveyor	**Preferred** - Lower installation costs	**Unacceptable** - High transportation costs could threaten the viability of the Proposed Project
Technical Applicability	**Acceptable** - Longer conveyor required	**Preferred** - In closer proximity to marine loading facility	N/A
Preferred Option		✔	

Note: N/A – Not applicable

2.8.2.5 Alternative Marine Loading Facility Locations

Alternative marine terminal locations considered include the following:

- Construction of the marine terminal in the existing log dump in the southwestern corner; and
- Construction of the marine terminal to the east of the existing log dump.

As part of the design process, consideration was given to alternative marine terminal locations. In order for the Proposed Project to be financially viable, the marine terminal (including dock and conveyor system) must accommodate barges of 5,000 to 6,000 deadweight tonnage (DWT). Barges of this size are approximately 80 m in length and have draughts of 4.5 m. Construction of the terminal to the west of the site was not considered feasible because it would be further from the processing area and closer to sensitive residential receptors that may be affected by noise and dust emissions from loading and departing vessels. The existing log dump supports the construction of the terminal without the requirement for marine dredging which may be required if the terminal was constructed elsewhere. Table 2-21 below shows a comparison of the alternative marine loading facility options considered and the preferred option of construction of the marine terminal and loading facility to the west of the existing log dump.

Table 2-21: Alternative Marine Loading Locations

Criteria	Alternative Options	
	Existing log dump	***Southeastern corner***
Environmental Effects	**Preferred** - Less environmental effects as dredging is not required	**Acceptable** - Mitigation/habitat offsetting may be needed if dredging is required
Social Effects	**Preferred** - Location further away from residential receptors	**Acceptable** - Mitigation may be required from potential noise and dust effects from loading operations
Cost Effectiveness	**Preferred** - Closer to preferred processing facility	**Acceptable** - More investment required if dredging and further conveyor required
Technical Applicability	**Preferred** - No dredging required	**Acceptable** - Dredging may be required
Preferred Option	✔	

2.8.2.6 Alternative Mining Methods

Alternative mining methods considered include the following:

- Excavation of material using mobile plant; and
- Clamshell dredge mining extraction.

Extracting material using mobile excavators was not considered a feasible alternative to clamshell mining as it would only allow for the mine to reach a total depth of 7 m (estimated water table). Mobile plant would also present greater safety concerns, be less cost effective and create more noise, dust and air emissions.

Clamshell dredge mining is considered more cost effective as a mine depth of approximately 35 m can be achieved and there are less safety concerns due to bank stability and potential for accidents when compared to the operation of mobile plant. Clamshell mining also supports the use of electric motor-driven systems which have less noise, air and dust emissions than the use of mobile plant.

Table 2-22 below shows a comparison of the alternative mining methods and the preferred option of clamshell mining.

Table 2-22: Alternative Mining Methods

Criteria	Alternative Options	
	Excavation using mobile plant	***Clamshell mining***
Environmental Effects	**Acceptable** - Noise, air and dust emissions	**Preferred** - Less noise, air and dust emissions
Social Effects	**Acceptable** - Greater safety concerns and potential for accidents	**Preferred** - Less safety concerns
Cost Effectiveness	**Acceptable** - Higher costs with using fossil fuels	**Preferred** - Increase in plant efficiency
Technical Applicability	**Unacceptable** - Stability issues - Limit to achievable mine depth	**Preferred** - Dredging to a greater depth
Preferred Option		✔

2.8.3 Summary of Alternative Means of Undertaking the Project

A summary of the alternative means of undertaking the Proposed Project is presented in Table 2-23 below.

Table 2-23: Summary of Alternative Means of Undertaking the Project

Alternatives Considered	Preferred Alternative
Alternative Project locations	
Treat Creek	
McNab Creek	✔
Alternative transportation options	
Road transportation	
Marine transportation	✔
Rail transportation	
Alternative mine layout options	
Area 1	✔
Area 2	
Area 3	
Alternative processing options	
Southeastern corner	

Alternatives Considered	Preferred Alternative
Southwestern corner	✔
Offsite processing	
Alternative marine loading facility location	
Existing log dump area	✔
Southeastern corner	
Alternative mining methods	
Excavation of material using mobile plant	
Clamshell dredge mining	✔

2.9 Project Land Use

Relevant Proposed Project land use information (other than information relating to land use by Aboriginal groups for traditional purposes) is summarized below. The majority of this information is provided in other sections of the EAC Application /EIS. These sections are referenced as applicable throughout the summary.

The Proposed Project is located on a 30 hectare (ha) portion of a 320 ha, privately-owned property ("the Project Property") which has been owned since 2008 by 0819042 B.C. Ltd and BURNCO. The Proposed Project Property is currently zoned by the SCRD as rural land use (RU2 Zone). Through an application to the SCRD, BURNCO is seeking to rezone the property to industrial use (I5 Zone) to allow for a processing facility (Sunshine Coast Regional District 2013e). Additional details regarding the description of the Sunshine Coast Regional District Zoning including tenures, licenses, permits or other authorizations that will be potentially required for or affected by the Proposed Project is provided in Volume 2, Part B – Section 6.1: Sustainable Economy. An industrial tenure will also be required for the barge loading facility. This is administered through the Mistry of Forest Lands and Natural Resource Operations (FLNRO). As described in Table 2-25 the proponent will hold one marine tenure for log handling lease area and a second tenure for occupation of water lot for the barge loading facility.

There is no Land and Resource Management Plan (LRMP) covering the western side of Howe Sound. Sea to Sky LRMP overlaps part of the Regional Study Area (RSA) for the assessment of non-traditional land-use, to the northeast of the LSA. The Sea to Sky LRMP designates the northern end of Howe Sound as 'Frontcountry Area' within an 'All Resource Uses Permitted Resource Management Zone'. The Frontcountry Area is considered the gateway through which all visitors to the region pass and where the majority of residents make their home, and is as a result, an area of intensive public and commercial recreational use. The Local Study Area (LSA) for the assessment of non-traditional land-use lies within Electoral Area F of the Sunshine Coast Regional District. While there are three Official Community Plans (OCP) in Electoral Area F, none of them overlap with the LSA. The closest OCP is for the Hillside-Port Mellon Area, located 7.4 km southwest of the Proposed Project by boat. The Hillside-Port Mellon Area is designated to accommodate a major industrial employment base for the Sunshine Coast Regional District, as well as provide for resource activities such as a demonstration forest.

There are nine different community planning areas across Howe Sound that may be relevant to the Proposed Project. A full description of each plan is provided in Volume 4, Part G – Section 22.0: Appendix 7.3-A, but common elements include emphasis on the protection of the environment, development of a sustainable economy, and creation of opportunities for outdoor recreation. The Project lies within the Islands Trust Area and the Islands Trust Policy Statement provides guidance for land use planning and regulation within this area. No Islands Trust Fund nature reserves are located within the LSA. Additional information regarding land and resource management as well as community plans is provided in Volume 2, Part B – Section 7.3. Those specifically related to existing plans developed by Aboriginal groups are summarized in Volume 4, Part C.

Several management and monitoring plans will be implemented during the Proposed Project which will be based on regional monitoring and management initiatives, including those described above. Volume 3, Part E – Section 16.0 summarizes what will be provided within these plans.

Public consultation activities undertaken during the Pre-Application stage included those associated with the federal and provincial review process. A detailed description of the public consultation process is provided in Section 3.3. Issues tracking related to those consultations are provided in Volume 4, Part G – Section 22.0: Appendix 2-C.

BURNCO plans to remain the owner of the property post-closure. At this time there are no plans for any future developments and/or land uses on the Property. Any future developments and/or land uses on the Property will align with local and regional land-use plans. Other developments and/or land uses that may result in overlapping effects with the Proposed Project are described in Volume 2, Part B - Section 4.0 in the cumulative effects section of the EA.

2.10 Project Benefits

The Proposed Project would have a positive effect on the local and B.C. economy, increasing the demand for goods, services and labour and generating tax revenue for all levels of government. During construction, total expenditures on goods and services by BURNCO are expected to be $21.5 million[9]. Total direct expenditures from the Proposed Project accruing to suppliers of B.C. produced goods and services would be approximately $8.3 million during construction, and approximately $13.0 million per year during operations. In total, there would be close to $170 million in direct spending on materials, goods and services produced in B.C. Employment will include approximately 80 and 360 person-years of direct employment during the construction and operations phase respectively. Section 2.5.4 provides additional information regarding direct employment as a result of the Proposed Project.

BURNCO plans to implement the following measures in order to enhance economic benefits generated by the Proposed Project for local residents and businesses:

- Hiring policies and practices to support local employment:

[9] Estimates of Project spending and revenues of suppliers are presented in 2012 constant dollars.

- Communicate employment requirements to local and First Nations residents to assist them in accessing opportunities;
- Actively seek to identify, recruit, employ and retain available local First Nations persons;
- Consider qualified local and regional residents for employment opportunities; and
- Include local and First Nations content as a consideration in the awarding of contracts.

- Policies and practices to support local procurement:
  - Communicate contract and procurement requirements to local businesses to assist them in accessing opportunities;
  - Compile and update inventories of existing and potential regional and local suppliers of goods and services to the Proposed Project; and
  - Use regional and locally based suppliers when their products and services meet BURNCO criteria of time sensitivity, scale of operations and productivity, cost competitiveness, quality, quantity, safety, technical, professional capability, financial capacity, community effect, and past work history.

During construction, total expenditures on goods and services by BURNCO are expected to be $21.5 million. Of this total, $5.3 million is expected to be spent on goods and services from other provinces, $5.6 million on goods and services from other countries, and $260,000 on goods withdrawn from inventories. Total direct expenditures from the Proposed Project accruing to suppliers and contractors in B.C. would be about $8.3 million.

The capacity of businesses in the SCRD to offer goods and services to support Proposed Project construction would determine the proportion of direct spending captured in the local economy. While the SCRD has some potential suppliers, such as water taxi services and certain retail and wholesale services, there are relatively few industrial construction projects undertaken on the Sunshine Coast and the nearby Metro Vancouver economy has extensive capabilities and experience with larger and industrial construction endeavours. The proximity of the Proposed Project site to the communities of the SCRD presents a competitive opportunity for local suppliers but the limited number of suppliers and their capabilities would present competitive challenges when larger and established suppliers are in Metro Vancouver.

Among industries directly supplying goods and services purchased by the Proposed Project during construction, spending on professional, scientific and technical services is anticipated to account for an estimated $2.1 million. This would be primarily for engineering, management and environment management and monitoring services. The next largest spending impact in B.C. would be for manufactured goods and equipment, at about $2.0 million. Spending on operating, office, cafeteria and lab supplies (mainly parts and maintenance supplies) is estimated to be $1.9 million, while spending on wholesale trade services would account for about $1.7 million.

Of the $13.0 million used to purchase goods and services annually during operations, $2.0 million is expected to be spent on goods and services imported from other parts of Canada, and $1.7 million on goods and services from other countries. Total direct expenditures from the Proposed Project accruing to suppliers and contractors in B.C. would be about $9.3 million per year.

During operations, the Transportation and Warehousing sector is expected to experience the largest effect relative to other direct suppliers ($4.4 million per year), followed by the Utilities sector ($1.3 million per year). Another $17.7 million in indirect and induced output is estimated per year of operation.

The household spending of the Proposed Project's direct and indirect labour would provide another goods and services supply opportunity for businesses. Induced output over the up to 2 year construction phase is expected to be an estimated $1.9 million in the province and about $0.8 million in the LSA. The LSA's average annual induced output in the operation phase is anticipated to be approximately $0.75 million and $2.1 million in the province as a whole.

The same industries will be the main induced output earners for both construction and operation phases and across activities, and they are anticipated to account for approximately 60% of induced output. The Finance, Insurance and Real Estate sector is no. 1, followed by Retail Trade, Accommodation and Food Services, Manufacturing and Information and Cultural Industries.

At the BC level, the Project would generate an estimated gross domestic product (GDP) total of $8.4 million over the two years of construction. This is a conservative estimate as it does not include the operating surplus portion of direct GDP[10]. During the operations stage, the Project would generate an estimated annual GDP total of $9.4 million. This too is a conservative estimate as it does not include the operating surplus portion of direct GDP.

Increases in local government expenditures during construction and operation phases are expected to be minimal as BURNCO would provide its own water and waste disposal. Increase in demand on services and infrastructure due to Proposed Project-induced population growth can affect local government expenditures. As the Proposed Project is not expected to affect population growth, an increase in such expenditures is not anticipated.

The Proposed Project would be subject to property taxation based upon SCRD requisitions. The assessed value of the Property for 2014 totalled approximately $628,800, which reflects current use as a managed forest and property tax payments for 2014 totalled $6,319[11]. The payments of property taxes to the SCRD and the B.C. Government would be much higher for the Property as a result of the change in assessment class to light industry and the rise in assessed value based on the use for aggregate extraction and processing. From a local perspective, the Property is subject to the aforementioned electoral area tax, and defined service area taxes for regional planning, regional recreation, animal control and Sunshine Coast Hospital. In addition there would be property taxation by the B.C. Government for school (a 2014 rate of 6.000) and general purposes (a 2014 rate of 2.9100).

BURNCO has historically supported the communities in which it operates in the form of sponsoring community events, raising money for charities and various forms of donation. In relation to the Proposed Project, BURNCO employees and their families have participated in the Great Canadian Shoreline Clean-up. Past and current BURNCO community initiative are documents on the BURNCO corporate website address below:

- http://www.burnco.com/burnco-corporate/community/community-support/

[10] The operating surplus for indirect and induced GDP is included in this estimate.

[11] The shown assessed value is the aggregated value for the four individual parcels and one foreshore tenure.

In addition to those economic benefits described above, several other benefits or positive effects will result from the Proposed Project and are summarized in Table 2-24. For additional information regarding the socio-economic benefits of the Proposed Project as well as the potential effects see Volume 2, Part B – Sections 6.1, 7.1 and 7.3.

Table 2-24: Summary of Benefits and Positive Effects resulting from the BURNCO Aggregate Project

VC	Benefit/Effect	Phase	Summary	EAC Application /EIS Reference
Environmentally Sensitive Ecosystems	Increase in the areal extent of riparian ecosystem within the LSA.	Reclamation and Closure	Approximately 3.33 ha of new riparian habitat will be created around the pit lake at closure.	Volume 2, Part B – Section 5.3
Amphibian Species at Risk	New amphibian breeding habitat within the lentic zone.	Reclamation and Closure	Approximately 28 ha will be converted to a lake which may provide amphibian breeding habitat within the lentic zone. The remaining 31 ha of the Proposed Project Area will be reclaimed and vegetated, and will provide upland habitat.	Volume 2, Part B – Section 5.3
Surface Water Anadromous Coho, Chum, and Pink Salmon and Coastal Cutthroat Trout and their habitats; and Freshwater resident Coastal Cutthroat Trout and their habitats	Higher baseflow rates, increase in wetted area and average flow depth, and reductions in predicted dry periods (i.e., greater water availability for aquatic habitat) in McNab Creek.	Operations	The analysis indicates that the reduced loss of baseflow from McNab Creek to the groundwater system would be between 1% and 39% when compared to baseline conditions (Year 0). Estimates of increased wetted area ranged from 6 m^2 to 188 m^2 through the operational phase of the Proposed Project. Estimates of increased average flow depth reached up to 0.002 m through the operational phase of the Proposed Project. Reduction in predicted dry periods would result in greater water availability for aquatic habitat in McNab Creek.	Volume 2, Part B – Section 5.5 and 5.1
	Increases in wetted area and average flow depth within WC 2.	Operations	The estimated increases in wetted area within WC 2 range from 1,231 m^2 to 1,421 m^2. Estimated increases in average flow depth range from 0.072 m to 0.114 m.	Volume 2, Part B – Section 5.5 and 5.1
	Increase in flows, wetted area and average depth in the foreshore minor streams (WC3, WC3-E, WC4-E, and WC 4-W).	Operations	Flow increase between 39% and 53% during the operational phase. Wetted area expected to increase from 2.1 m^2 to 12.4 m^2 for the Foreshore Minor Streams. Increased average flow depth ranged from 0.002 m to 0.007 m.	Volume 2, Part B – Section 5.5 and 5.1
	Increase baseflow rates in WC 5.	Operations	In the range of 863 m^3/day to 1,070 m^3/day.	Volume 2, Part B – Section 5.5 and 5.1
	Increase in baseflow in McNab Creek.	Reclamation and Closure	Baseflow in McNab Creek would be slightly higher than baseline.	Volume 2, Part B – Section 5.5 and 5.1

VC	Benefit/Effect	Phase	Summary	EAC Application /EIS Reference
	Increase in baseflows in the foreshore minor streams (WC3, WC3-E, WC4-E, WC 4-W).	Reclamation and Closure	Will be increased by 53% in the closure phase relative to baseline conditions.	Volume 2, Part B – Section 5.5 and 5.1
Real Estate	Improved aesthetic qualities.	Reclamation and Closure	Improved aesthetic qualities of the Property after closure would likely have a positive effect on nearby property use and value.	Volume 2, Part B – Section 7.1
Mineral and Industrial Development	Positive effect on mining activity.	Construction and Operations	Proponent holds all mineral tenures and mining claims within the Property.	Volume 2, Part B – Section 7.3
Visual Quality	Removal of anthropogenic features will reduce visual contrast with the existing landscape character resulting in positive social and recreational effects related to an increase in scenic character of the Proposed Project site.	Reclamation and Closure	There is the potential for positive effects on visual quality, since the removal of visible Proposed Project components related to Proposed Project operation, including marine and land based site infrastructure, will eliminate anthropogenic features will reduce visual contrast with the existing landscape character. Landscape features will be designed and establishment through progressive and final remediation efforts.	Volume 2, Part B – Section 7.4

2.11 Applicable Permits and Approvals

Table 2-25 summarizes applicable local, provincial, and federal permits and approvals required for the Proposed Project.

BURNCO Aggregate Project has been identified as a candidate for coordinated permitting through the Coordinated Permit Review Process (CPRP) model and the project management approach administered by the Ministry of Energy and Mines' Major Mines Project Office (MMPO). The MMPO within the Ministry of Energy and Mines (MEM) is responsible for ensuring that the coordinated review is implemented according to timelines which have been mutually negotiated and agreed upon with the Proponent, and will be overseen by the Major Mine Project Board (Project Board). To date, BURNCO has participated in the following meetings in support of this coordinated permitting process:

- October 8, 2015 – Pre-Application Meeting with MMPO to present Project Overview and status of EA and related permitting, and to discuss process and steps required to permit the Project;
- November 14, 2015 – Pre-Application meeting to introduce MEM to the proposed BURNCO Aggregate Mine Project and for MEM technical staff to provide specific feedback regarding *Mines Act* permit application information requirements;
- January 14, 2016 – Pre-Application meeting with BC Hydro and MMPO to discuss BC Hydro components of BURNCO Aggregate permitting Project;
- April 7, 2016 - Pre-Application meeting to present the Reclamation and Effective Closure Plan and Erosion and Sediment Control Plan for proposed BURNCO Aggregate Project to MEM and FLNRO Technical Reviewers to discuss permit application requirements; and
- April 22, 2016 – Pre-Application meeting with MMPO to introduce new MMPO staff to the proposed BURNCO Aggregate Project and discuss the MMPO Project Charter and permit application requirements.

BURNCO is therefore not pursuing concurrent provincial permitting under the *Concurrent Approval Regulation*.

Table 2-25: List of Required Permits and Approvals

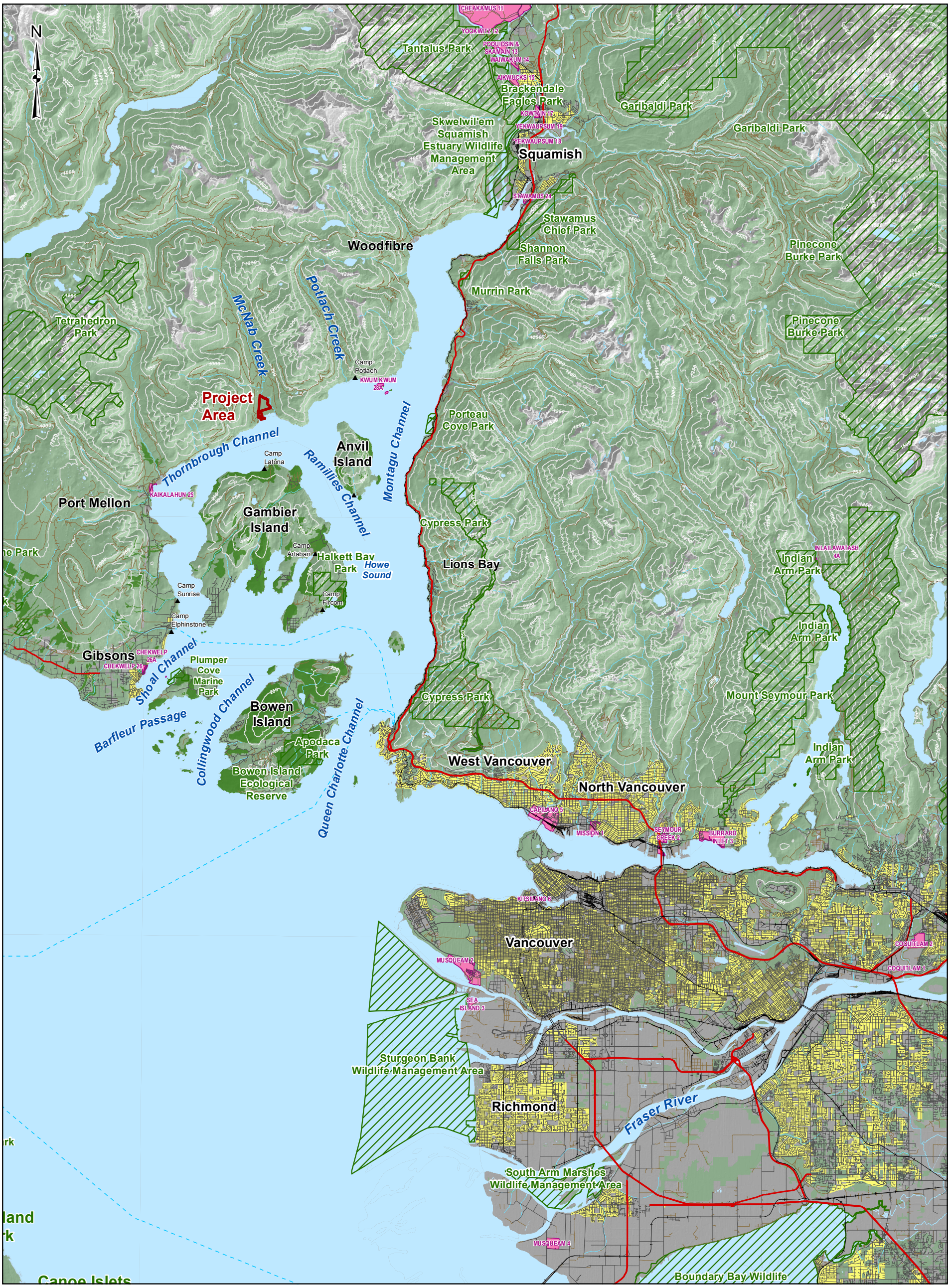
Statute	Responsible Agency	Requirement
Local Government		
Rezoning Bylaw	Sunshine Coast Regional District	Rezoning from RU2 Zone (Rural Two) rural land use to industrial I5 Zone (Industrial Five) for processing facilities.
Provincial		
BC Environmental Assessment Act	BC Environmental Assessment Office	EA Certificate
BC Mines Act	Ministry of Energy and Mines	Application for *Mines Act* Permit. Permitting Approved work system and reclamation program; Approvals to construct and operate.

Statute	Responsible Agency	Requirement
British Columbia *Water Sustainability Act*	Ministry of Forests, Lands and Natural Resource Operations	In the Province of British Columbia legislation of matters relating to use and flow of surface water and groundwater, and protection of water resources are governed by the *Water Sustainability Act* (WSA) (SBC 2014). On February 29, 2016, the Regulations of the *Water Act* (RSBC 1996) were repealed and the WSA was brought into force, along with five new regulations, including the *Water Sustainability Regulation* (B.C. Reg 36/2016), the *Water Sustainability Fees, Rentals and Charges Tariff Regulation* (B.C. Reg. 37/2016), the *Groundwater Protection Regulation* (GWPR) (B.C. Reg. 39/2016), and the *Dam Safety Regulation* (BC Reg. 40/2016). The *Water Sustainability Regulation* includes requirements for the licensing, diversion and use of groundwater and surface water to protect water resources and ecosystems, while the GWPR specifically addresses protection of the groundwater resource and identifies requirements for the construction of wells (discussed in detail in Volume 2, Part B – Section 5.6).
Land Act	Ministry of Forests, Lands and Natural Resource Operations	Proponent to hold one lease for log handling, second lease for occupation of water lot for marine loading facility.
Forest Act, *Forest and Range Practices Act*, *Forest Practices Code*	Ministry of Forests, Lands and Natural Resource Operations, Sunshine Coast District Manager	Special Use Permit, Occupant License to Cut. Use of Crown land in Provincial Forest or wilderness areas; site clearing; access clearance and development.
Environmental Management Act	Ministry of Environment	Temporary concrete batch plant registration
Environmental Management Act – Spill Reporting Regulations, 1990 [Includes amendments up to B.C. Reg. 376/2008, December 9, 2008]	Ministry of Environment	The regulation defines a “spill” as an unauthorized release or discharge of a listed substance into the environment in an amount exceeding the listed quantity and specifies reporting to the Provincial Emergency Program (PEP).
Open Burning Smoke Control Regulation	Ministry of Environment	Compliance if land clearing and subsequent burning of vegetative debris is contemplated.
Heritage Conservation Act (HCA)	Ministry of Forests, Lands and Natural Resource Operations – Archaeology Branch	*HCA* Section 14 Inspection Permit to conduct a Heritage Inspection (also referred to as an Archaeological Impact Assessment [AIA]). *HCA* Section 14 Investigation Permit to conduct a Heritage Investigation. *HCA* Section 12 Site Alteration Permit to conduct alterations to a heritage site. Facilitates the protection and conservation of heritage resources in BC. Does not apply to reserve lands which are under federal jurisdiction.

Statute	Responsible Agency	Requirement
Wildlife Act [RSBC 1996] Chapter 488	Ministry of Forests, Lands and Natural Resource Operations	Protects wildlife and wildlife habitat in the province by identifying wildlife areas, defining human interactions with wildlife, and regulating hunting, trapping and angling. It is an offence to capture wildlife, alter wildlife habitat, deposit substances into wildlife habitat or destroy eggs or nests under this Act (*Wildlife Act* 1996). Section 29 – prohibits attempts to capture wildlife unless authorized. Section 34 – prohibits the possession, removal, injury or destruction of a bird or its egg, or the nest when it is occupied by a bird or its egg.
Health Act, *Drinking Water Protection Act*, various	Vancouver Coastal Health	Water supply system construction permit, operating permit, and holding tanks as needed.
Fire Services Act	BC Public Safety Agency	Firefighting facilities. Fuel Storage Approval.
Federal		
former *Canadian Environmental Assessment Act*	CEA Agency	favourable federal EA decision
Fisheries Act R.S.C., 1985	Fisheries and Oceans Canada	Section 35 – Prohibits any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery. 'Serious harm to fish' is defined in Section 2 of the *Fisheries Act* as the death of fish, or permanent alteration to or destruction of fish habitat. Section 36 - Prohibits the deposit of a deleterious substance in waters frequented by fish. Section 38(4) – Duty to report provisions which require notification to an inspector, fishery office or prescribed authority, of an occurrence that results in serious harm to that are part of a commercial, recreational, or Aboriginal fishery, or to fish that supports such fishery, that is not authorized under the Act, or a serious and imminent danger of such an occurrence. Section 38(5) – Duty to report provisions which require notification to an inspector, fishery office or prescribed authority, of the deposit or imminent danger of deposit, of a deleterious substance in waters frequented by fish, and detriment to fish habitat or fish or to the use by humans of fish results ore may reasonably be expected to result from the occurrence. Section 38(6) – Duty to take all reasonable measures provisions which require that all reasonable measures consistent with safety and with the conservation of fish and fish habitat to prevent any occurrence referred to in subsection (4) or (5) or to counteract, mitigate or remedy any adverse effects that result or may reasonably be expected to result from the occurrence. The '*Deposit out of the Normal Course of Events Notification*

Statute	Responsible Agency	Requirement
		Regulations' specify the BC Provincial Emergency Program as the 24-hr emergency telephone service for notification. The reportable levels specified in the provincial *Spill Reporting Regulation* pursuant to the *Environmental Management Act* do not necessarily define a "deleterious substance". The requirements of these sections are to be considered in the development of the Spill Response Plan (Volume 3, Part E - Section 16.0).
Marine Mammal Regulations (pursuant to the *Fisheries Act*)	Fisheries and Oceans Canada	Section 7 – Prohibition against disturbing marine mammals unless fishing for them under authority of the Regulations. Section 10 – Requires a person who kills or wounds a marine mammal to make a reasonable effort to retrieve the animal and prohibits abandoning the animal.
Migratory Birds Convention Act, 1994 (S.C. 1994, c.22)	Environment and Climate Change Canada (Formerly Environment Canada)	Implements an internationally recognized convention between Canada and the United States to protect various species of migratory game birds, migratory insectivorous birds, and migratory non-game birds. This Act prohibits the deposit of substances harmful to migratory birds. The Migratory Birds Regulations and the Migratory Birds Sanctuary Regulations protect migratory birds under this Act (Migratory Birds Convention Act 1994). Section 5 – Prohibits the deposit by a person or vessel of a substance, or combination of substances, that is harmful to migratory birds, in waters or an area frequented by migratory birds. Prohibits the disturbance, destruction or removal of a nest or related shelter, or egg of a migratory bird, or possession of a live migratory bird, or a carcass, nest or egg of a migratory bird.
Species at Risk Act (2002, c.29)	Environment and Climate Change Canada and Fisheries and Oceans Canada	Protects Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, provides for the recovery of endangered or threatened species, and encourages the management of other species to prevent them from becoming at-risk. To kill, harm, harass, capture or take wildlife listed as Extirpated, Endangered or Threatened is prohibited. The Act prohibits damage to residences or critical habitat of listed species and applies only on federal land with the exception of aquatic species and migratory birds listed in the federal *Migratory Birds Convention Act*, 1994. In some circumstances, the federal prohibitions can be applied to other species on private or provincial Crown land if it is deemed that provincial or voluntary measures do not adequately protect a species and its residence (Species at Risk Act 2002). Section 32 – Prohibition against killing, harming, harassing, capturing or taking an individual of a species listed as extirpated, endangered, or threatened. Section 33 – Prohibition against damaging or destroying the residence of individuals of a species listed as extirpated, endangered, or threatened. No Specific approval required for the Proposed Project.

Statute	Responsible Agency	Requirement
Navigation Protection Act R.S.C., 1985	Transport Canada	Regulates works that that may result in permanent or temporary navigational interference or hazards within navigable Canadian waters (*Navigation Protection Act* 1985). Approval of the construction of works in waterways that might otherwise violate the common law right of navigation. Approval will be required for the construction of the terminal facilities.
Canadian Shipping Act, 2001 (2001, c.26)	Transport Canada	Promotes marine transportation and recreational boating safety and protection of the marine environment from damage due to navigation and shipping activities (e.g., discharges) through provisions under the Act and a series of regulations and orders pursuant to the Act (e.g., the Co*llision Regulation; Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals*; *Canadian Shipping Act* 2001).
Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34)	Transport Canada	Regulates the transport of all dangerous goods in Canada, whether by rail, road, air, or water, and establishes safety standards and documentation to be complied with such that all containers, packages, and means of transport are clearly marked with prescribed safety marks. Also established requirements regarding emergency response assistance plans (*Transportation of Dangerous Goods Act* 1992).



LEGEND

- Project Area
- Park / Protected Area
- Sensitive Environmental Area
- Vegetation
- Indian Reserve
- Residential Area
- Waterbody
- Highway
- Road
- Resource Road
- Railway
- Ferry
- Watercourse
- Contour (250m)
- Camp

10 0 10

SCALE 1:250,000 KILOMETRES

REFERENCE

Parks/protected areas and sensitive areas from the Province of British Columbia. Elevation and indian reserves from Geobase. Base data from CanVec. Projection: UTM Zone 10 Datum: NAD 83

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

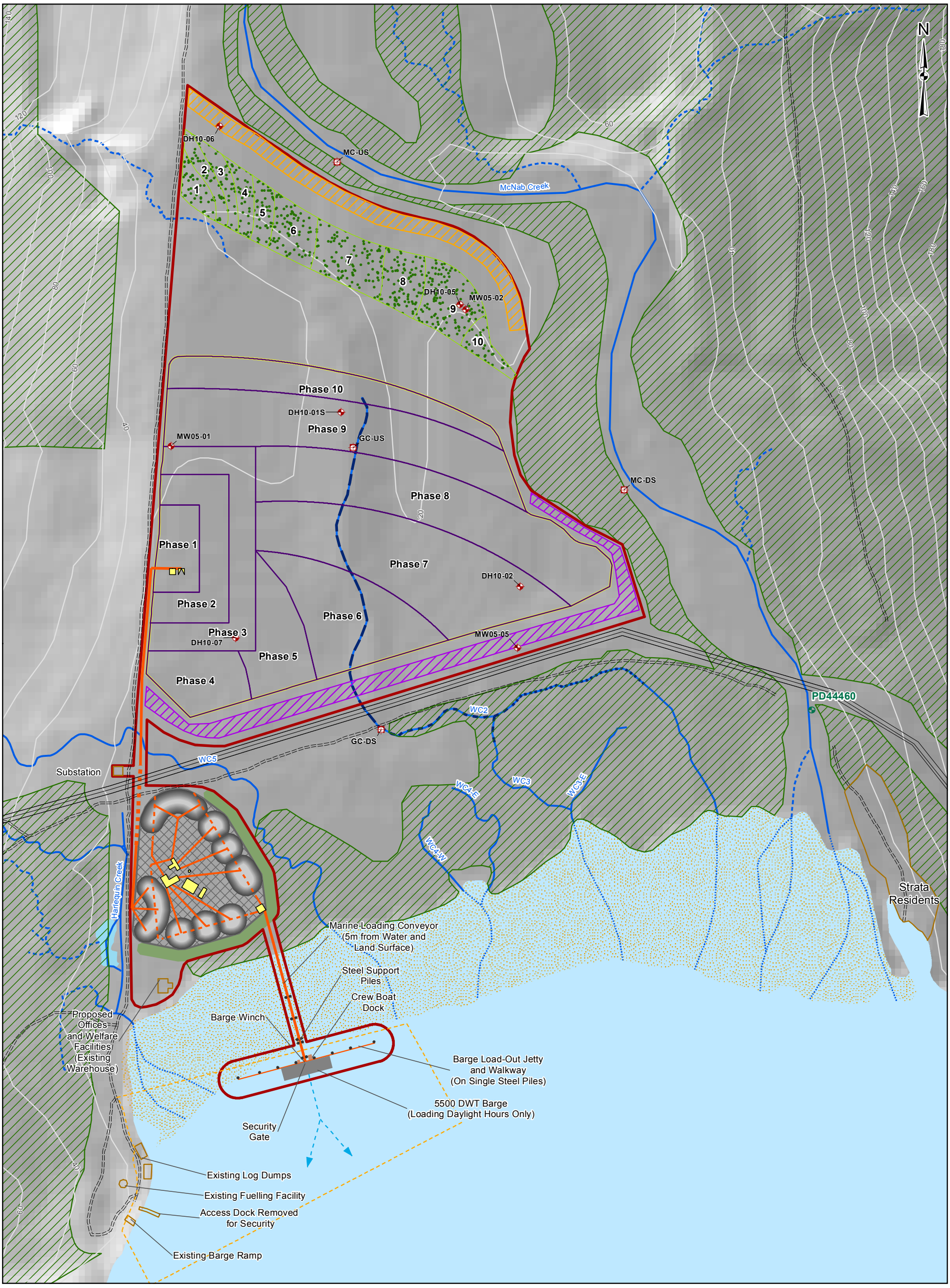
TITLE

LOCATION OF BURNCO AGGREGATE PROJECT

Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MD	2 Nov. 2012	SCALE AS SHOWN	REV. 0
GIS	DL	05 Apr. 2016	FIGURE 2-1	
CHECK	AS	10 Jun. 2014		
REVIEW	AC	10 Jun. 2014		

Path: X:\Project Data\BCMcNab\Figures\MXD\dAIR\Project_Description\Figure_2-1_Location_of_Burnco_Aggregate_Project.mxd



LEGEND

- Project Area
- Proposed Aggregate Pit Phase
- Final Pit Lake Outline
- McNab Creek Flood Protection Dyke
- Pit Lake Containment Berm
- Fines Storage Area
- Processing Area
- Existing Feature
- Existing Log Tenure Area
- Product Stockpiles
- Possible Processing Plant Configuration
- Processing Area Dirt Berm
- Mature Forest
- Intertidal Zone
- Elevated Conveyor
- Underground Conveyor
- Barge Load-out
- Transmission Line
- Road (existing)
- Contour (20m)
- Barge Route
- Permanent / Perennial Watercourse
- Intermittent Watercourse
- Intertidal Watercourse

Constructed Watercourse

- Phase 1 (1985)
- Phase 2 (1998)
- Phase 3 (2001 - 2003)
- Current Water Licence (POD)
- Monitoring Well (Golder 2012)
- Surface Water Monitoring Station (Golder 2012)

REFERENCE

DEM from Geobas. Base data from the Province of British Columbia. Contours from TRIM positional data. Additional detailed site features provided by McElhanney. Projection: UTM Zone 10 Datum: NAD 83

200 0 200

SCALE 1:6,000 METRES

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

TITLE

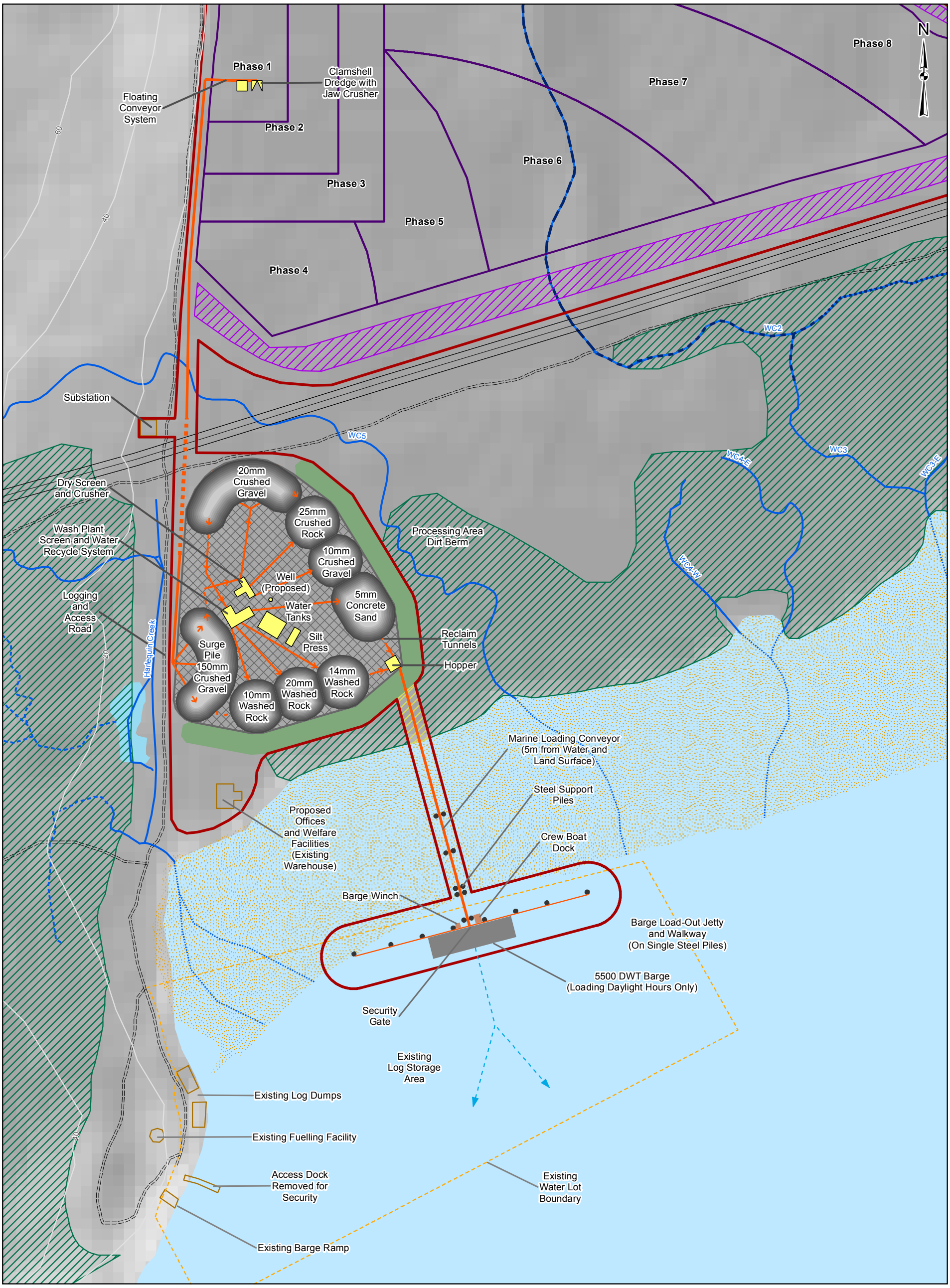
PROPOSED CONCEPTUAL SITE LAYOUT

Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MJ	2 Nov. 2012	SCALE AS SHOWN	REV. 13
GIS	DL	06 Apr. 2016		
CHECK	AS	10 Jun. 2014		
REVIEW	AC	10 Jun. 2014		

FIGURE 2-2

Path: X:\Project Data\BC\McNab\Figures\MXD\dAIR\Project_Description\Figure_2-2_Proposed_Conceptual_Site_Layout.mxd



LEGEND

- Project Area
- Proposed Aggregate Pit Area
- Possible Processing Plant Configuration
- Product Stockpiles
- Processing Area Dirt Berm
- Pit Lake Containment Berm
- Processing Area
- Existing Feature
- Existing Log Tenure Area
- Mature 2nd Growth Forest
- Intertidal Zone
- Conveyor Buffer
- Elevated Conveyor
- Underground Conveyor
- Barge Load-out
- Transmission Line
- Road (Existing)
- Contour (20m)
- Permanent / Perennial Watercourse
- Intermittent Watercourse
- Intertidal Watercourse

Constructed Watercourse

- Phase 1 (1985)
- Phase 2 (1998)
- Phase 3 (2001 - 2003)
- Barge Route

100 0 100

SCALE 1:3,500 METRES

REFERENCE

DEM from Geobase. Base data from the Province of British Columbia. Contours from TRIM positional data. Additional detailed site features provided by McElhanney. Projection: UTM Zone 10 Datum: NAD 83

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

TITLE

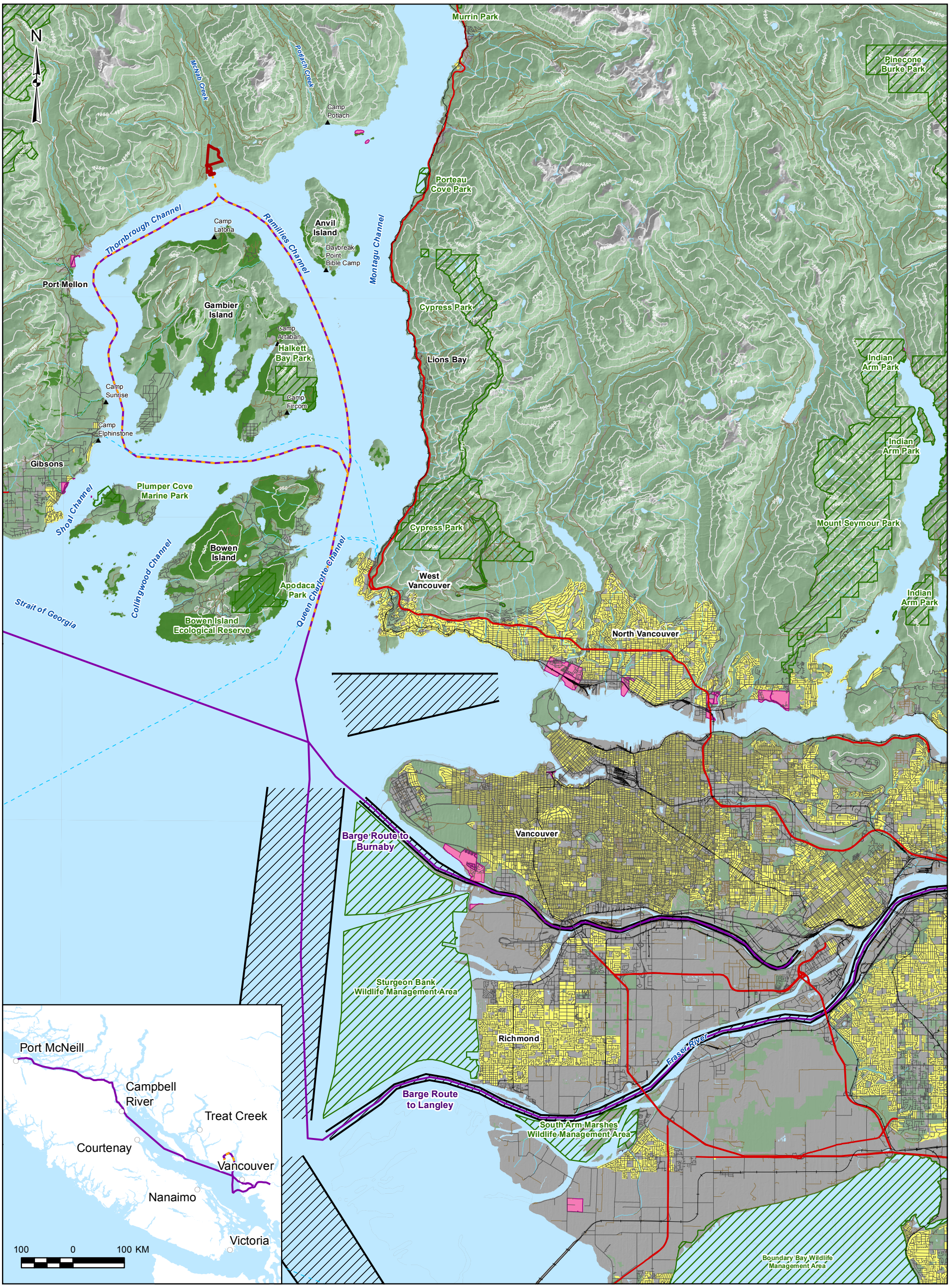
PROPOSED OPERATIONAL SITE LAYOUT

Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MJ	5 Jan. 2013	SCALE AS SHOWN	REV. 11
GIS	DL	06 Apr. 2016		
CHECK	AS	10 Jun. 2014		
REVIEW	AC	10 Jun. 2014		

FIGURE 2-3

Path: X:\Project Data\BC\McNab\Figures\MXD\dAR\Project_Description\Figure_2-3_Proposed_Operational_Site_Layout.mxd



LEGEND

- Project Area
- Proposed Barging Route
- Existing Barging Route
- Existing Shipping Navigational Channels
- Park / Protected Area
- Sensitive Environmental Area
- Vegetation
- Indian Reserve
- Residential Area
- Highway
- Road
- Resource Road
- Railway
- Ferry
- Contour (250m)
- Camp

REFERENCE

Parks/protected areas and sensitive areas from the Province of British Columbia. Elevation and indian reserves from Geobase. Base data from CanVec. Projection: UTM Zone 10 Datum: NAD 83

8 0 8

SCALE 1:200,000 KILOMETRES

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

TITLE

PROPOSED AND EXISTING BARGE SHIPPING ROUTES

Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MD	2 Nov. 2012	SCALE AS SHOWN	REV. 5
GIS	DL	06 Apr. 2016	**FIGURE 2-4**	
CHECK	AS	10 Jun. 2014		
REVIEW	AC	10 Jun. 2014		

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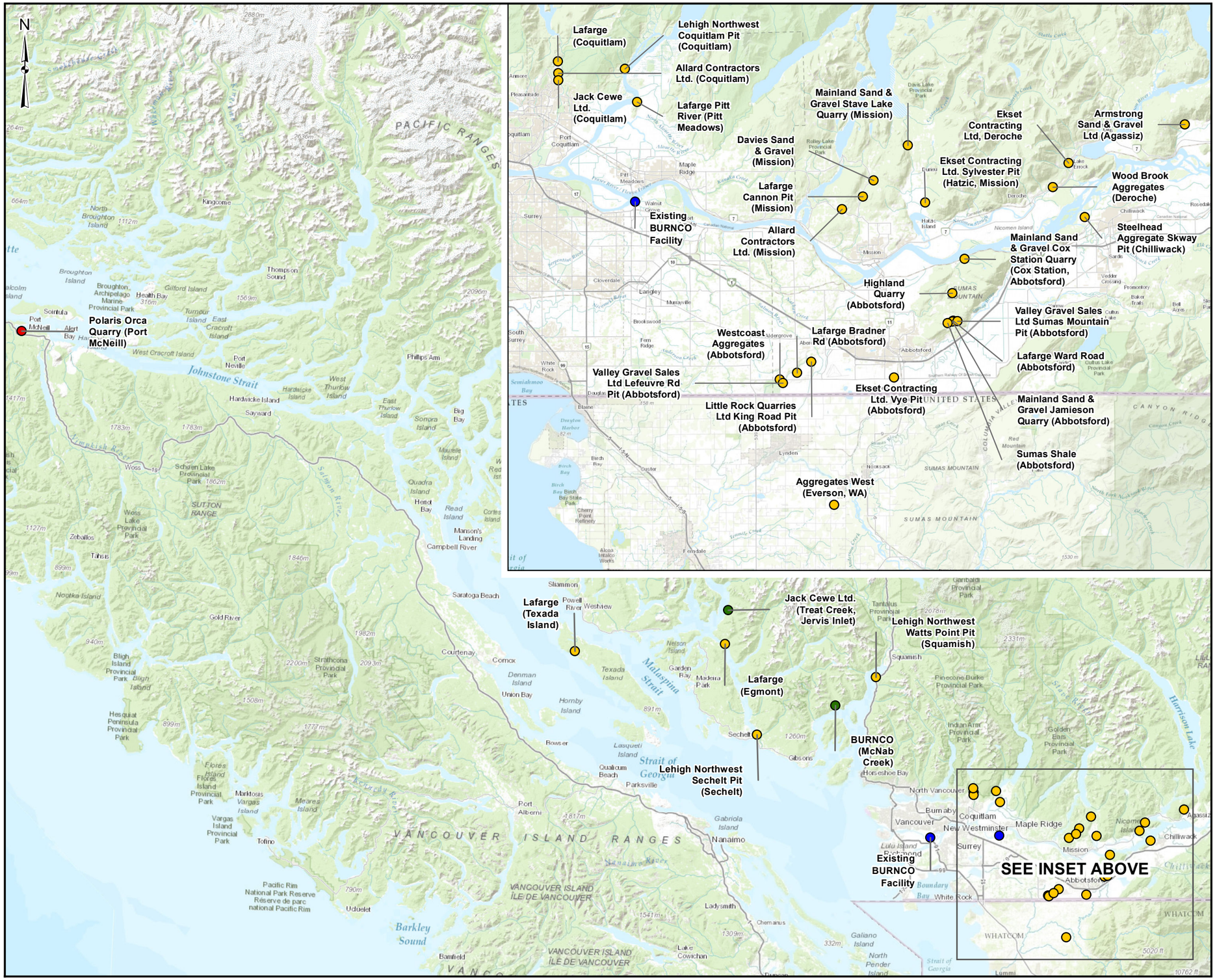


LEGEND

- Current Aggregate Supplier
- Alternative Aggregate Supplier
- Alternative Aggregate Mine Location
- Existing BURNCO Facility

REFERENCE

Base data obtained from ESRI Basemaps and its data suppliers, Redmond, WA, 2009. Projection: UTM Zone 10 Datum: NAD 83

50 0 50

SCALE 1:1,250,000 KILOMETRES

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

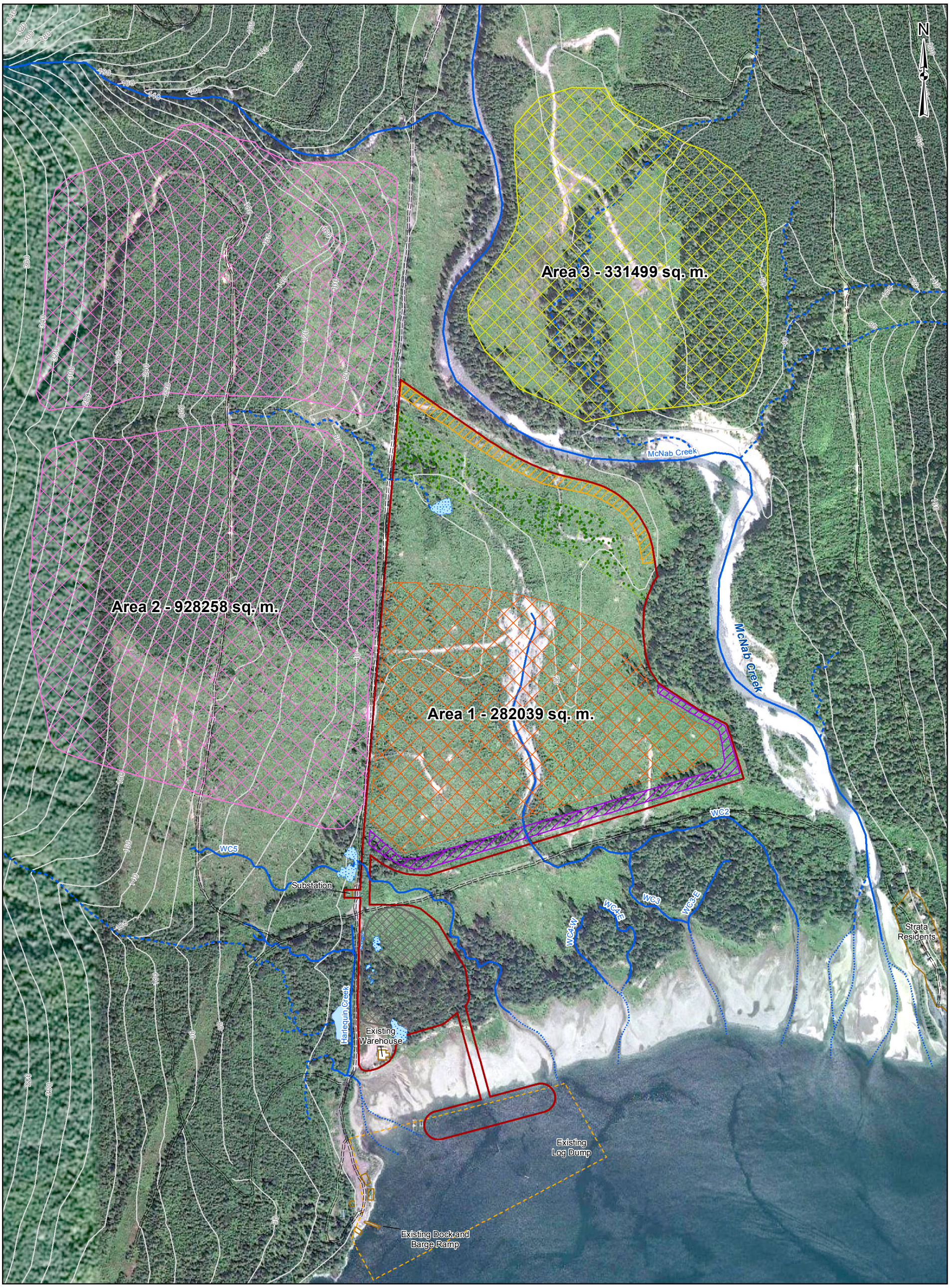
TITLE

ALTERNATIVES TO THE PROPOSED PROJECT

Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MJ	12 Mar. 2013	SCALE AS SHOWN	
GIS	DL	06 Apr. 2016	REV. 0	
CHECK	KZ	14 Apr. 2016	**FIGURE 2-5**	
REVIEW	JF	14 Apr. 2016		

Path: X:\Project Data\BC\McNab\Figures\MXD\dAIR\Project_Description\Figure_2-5_Alternatives_to_the_Proposed_Project.mxd



LEGEND

- Area 1 - Current Proposed Mine Area
- Area 2 - Alternative Mine Layout
- Area 3 - Alternative Mine Layout
- Project Area
- McNab Creek Flood Protection Dyke
- Pit Lake Containment Berm
- Fines Storage Area
- Processing Area
- Existing Feature
- Existing Log Tenure Area
- Road (Existing)
- Contour (20m)
- Permanent / Perennial Watercourse
- Intermittent Watercourse
- Intertidal Watercourse
- Beaver Impounded Wetted Area
- Low Lying Wetted Area

REFERENCE

Base data from the Province of British Columbia. Contours from TRIM positional data. Image from Google Earth Pro.
Projection: UTM Zone 10 Datum: NAD 83

200 0 200

SCALE 1:8,000 METRES

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

TITLE

ALTERNATIVE MINE LAYOUTS FOR THE PROPOSED PROJECT

Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MD	06 May 2013	SCALE AS SHOWN	REV. 0
GIS	DL	06 Apr. 2016	**FIGURE 2-6A**	
CHECK	KZ	14 Apr. 2016		
REVIEW	JF	14 Apr. 2016		

Path: X:\Project Data\BC\McNab\Figures\MXD\dAR\Project_Description\Figure_2-6A_Alternative_Mine_Layouts_Considered.mxd

LEGEND

- Current Proposed 16 Year Mine Plan
- Previous 20 Year Mine Plan
- Project Area
- Previous Project Area
- McNab Creek Flood Protection Dyke
- Pit Lake Containment Berm
- Fines Storage Area
- Processing Area
- Existing Feature
- Existing Log Tenure Area
- Road (Existing)
- Contour (20m)
- Permanent / Perennial Watercourse
- Intermittent Watercourse
- Intertidal Watercourse
- Beaver Impounded Wetted Area
- Low Lying Wetted Area

REFERENCE

Base data from the Province of British Columbia. Contours from TRIM positional data, Image from Google Earth Pro.
Projection: UTM Zone 10 Datum: NAD 83

200 0 200

SCALE 1:6,000 METRES

PROJECT

BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT, HOWE SOUND, B.C.

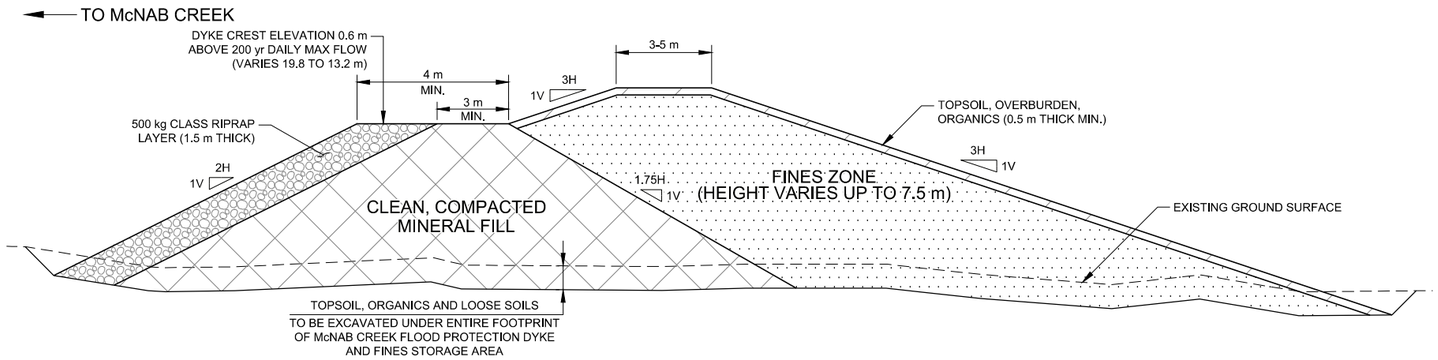
TITLE

ALTERNATIVE SITE LAYOUTS FOR THE PROPOSED PROJECT

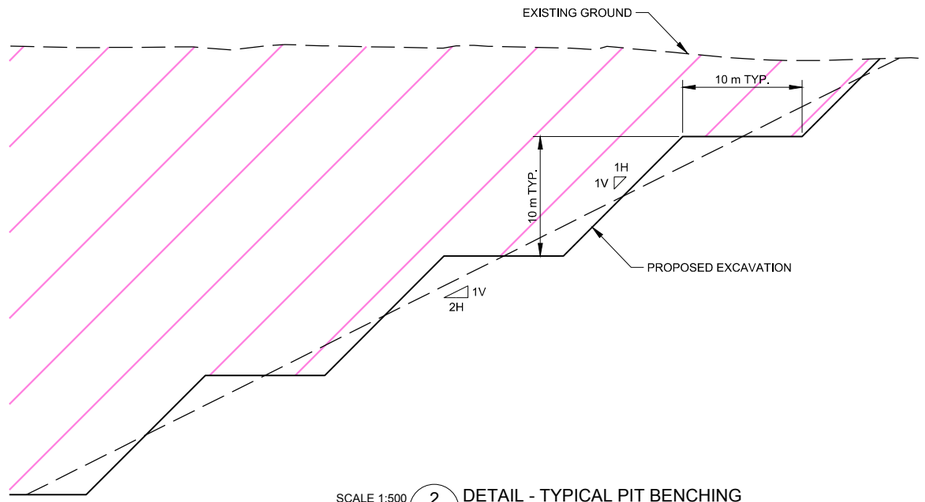
Golder Associates

PROJECT NO. 11-1422-0046			PHASE No.	
DESIGN	MD	06 May. 2013	SCALE AS SHOWN	REV. 0
GIS	DL	06 Apr. 2016	FIGURE 2-6B	
CHECK	KZ	14 Apr. 2016		
REVIEW	JF	14 Apr. 2016		

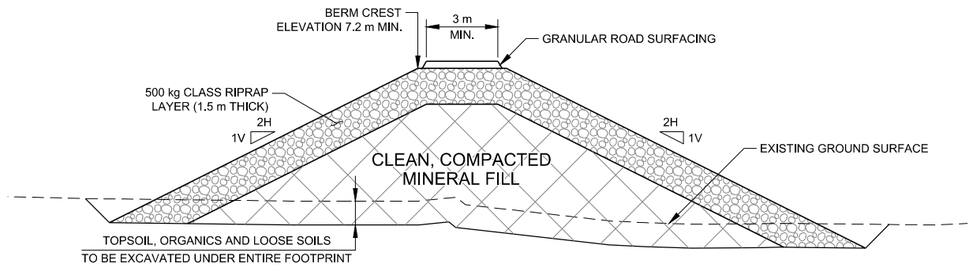
Path: X:\Project Data\BC\McNab\Figures\MXD\dAR\Project_Description\Figure_2-6B_Alternative_Site_Layouts_Considered.mxd



SCALE 1:250 — 1 / # — DETAIL - TYPICAL McNAB CREEK FLOOD PROTECTION DYKE AND FINES STORAGE AREA



SCALE 1:500 — 2 / # — DETAIL - TYPICAL PIT BENCHING



SCALE 1:250 — 3 / # — DETAIL - TYPICAL PIT LAKE CONTAINMENT BERM

NOT FOR CONSTRUCTION

0 10 20
1:500 METRES

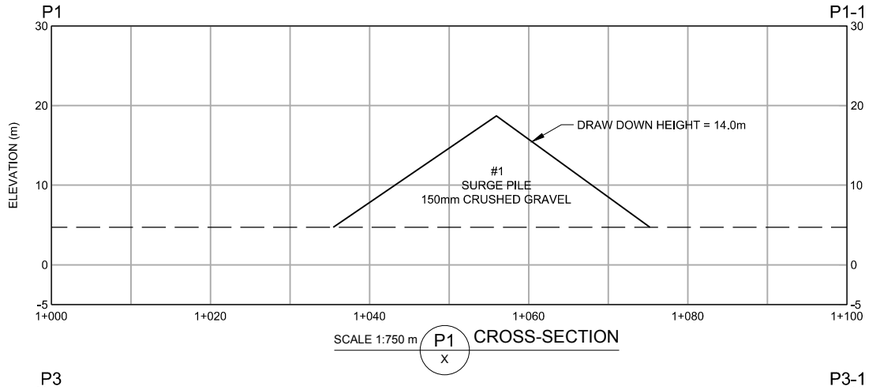
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
0	2016-04-07	FINAL	CC	MSH	FHS	RCB
A	2014-04-11	ISSUED FOR REVIEW	FHS	MSH	-	-

PROJECT
BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT
HOWE SOUND, B.C.

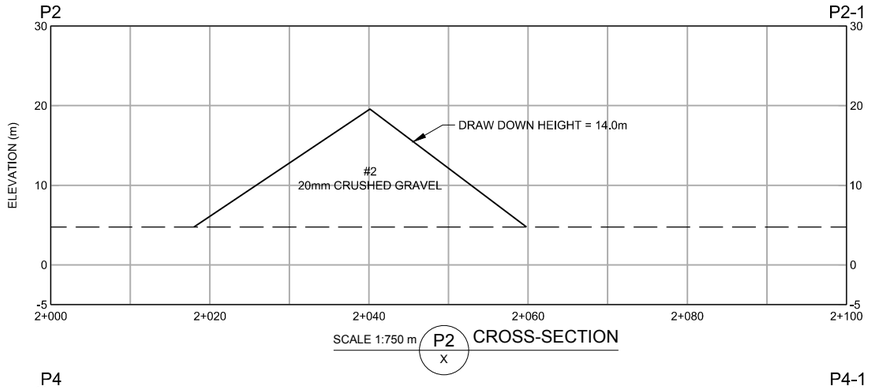
TITLE
McNAB CREEK FLOOD PROTECTION DYKE FINES STORAGE AREA, PIT BENCHING AND PIT LAKE CONTAINMENT BERM

Golder Associates

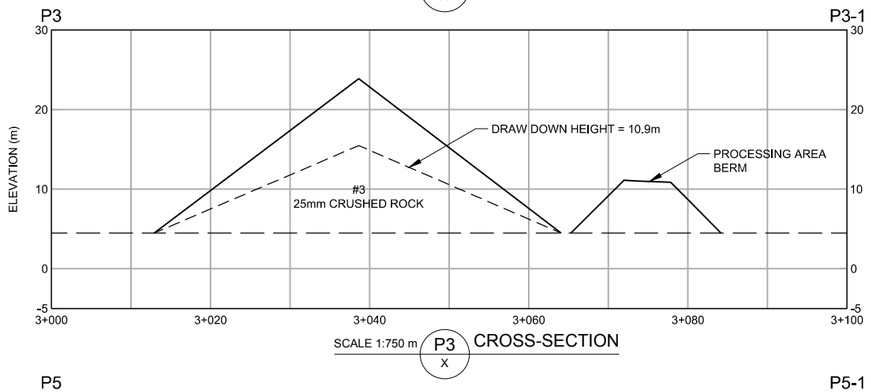
PROJECT No.	11-1422-0046.3100		FILE No.	1114220046-3100-2-7
DESIGN	CC	2016-04-07	SCALE	SCALE
CADD	MSH	2016-04-07	FIGURE	
CHECK	FHS	2016-04-07		2-7
REVIEW	RCB	2016-04-07		



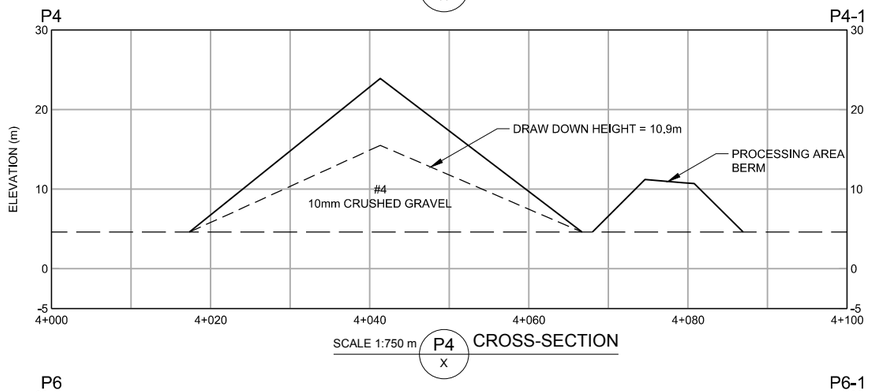
SCALE 1:750 m P1 X CROSS-SECTION



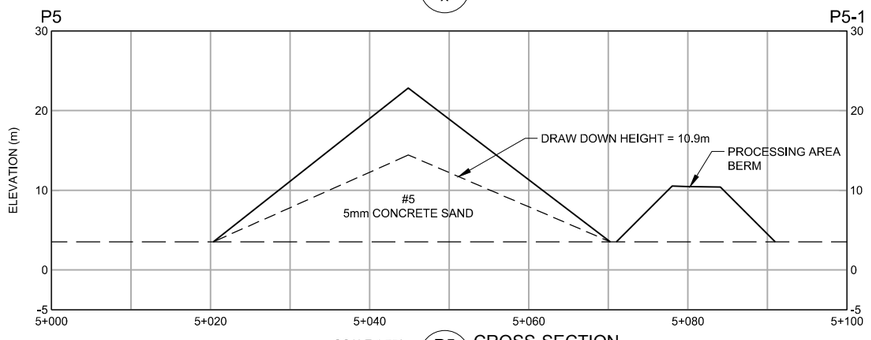
SCALE 1:750 m P2 X CROSS-SECTION



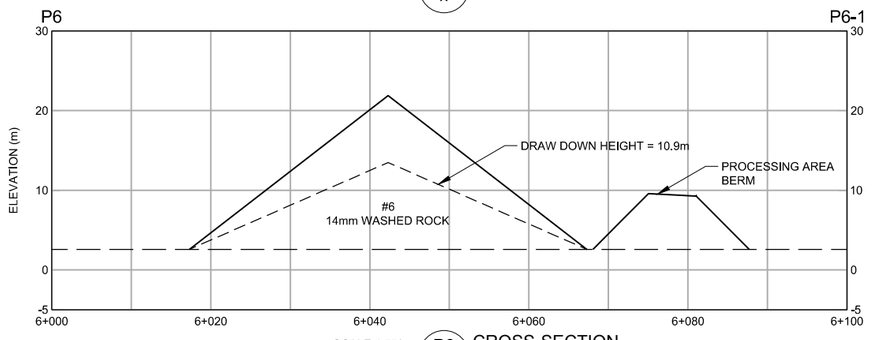
SCALE 1:750 m P3 X CROSS-SECTION



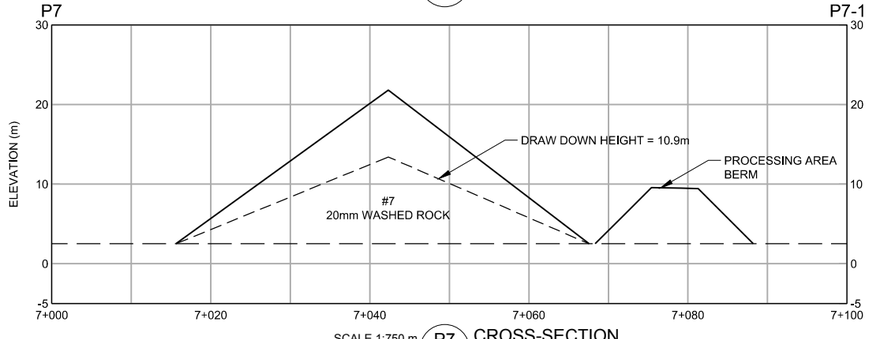
SCALE 1:750 m P4 X CROSS-SECTION



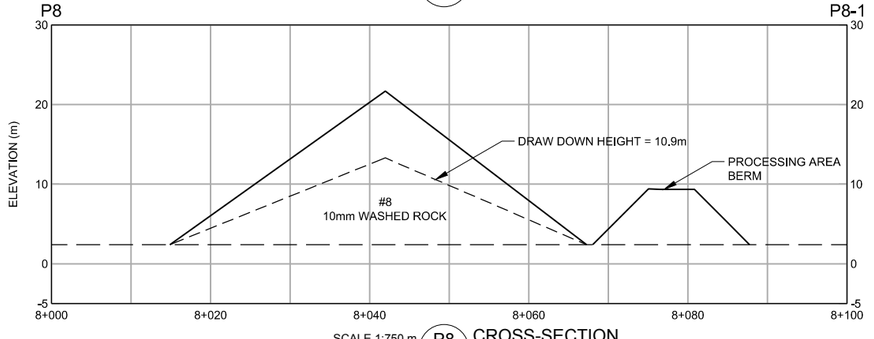
SCALE 1:750 m P5 X CROSS-SECTION



SCALE 1:750 m P6 X CROSS-SECTION



SCALE 1:750 m P7 X CROSS-SECTION



SCALE 1:750 m P8 X CROSS-SECTION

No.	DESCRIPTION	MAX MASS OF PILE (TONNES)	SURFACE AREA (m^2)	HEIGHT (m)	SLOPE (°)
1	SURGE PILE 150mm CRUSHED GRAVEL	44,100	5332	14	34.3
2	MATERIAL STORAGE 20mm CRUSHED GRAVEL	55,500	6587	14	34.3
3	MATERIAL STORAGE 25mm CRUSHED ROCK	21,200	4638	19.3	37.3
4	MATERIAL STORAGE 10mm CRUSHED GRAVEL	21,200	4638	19.3	37.3
5	MATERIAL STORAGE 5mm CONCRETE SAND	35,100	6675	19.3	37.3
6	MATERIAL STORAGE 14mm WASHED ROCK	21,200	4638	19.3	37.3
7	MATERIAL STORAGE 20mm WASHED ROCK	21,200	4638	19.3	37.3
8	MATERIAL STORAGE 10mm WASHED ROCK	21,200	4638	19.3	37.3

NOT FOR CONSTRUCTION

0 12.5 25
1:750 METRES

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
1	2016-04-07	FINAL	JF	MSH	JF	WM
2	2014-04-28	ISSUED FOR REIVEW	-	MSH	-	-

PROJECT
BURNCO ROCK PRODUCTS LTD.
BURNCO AGGREGATE PROJECT
HOWE SOUND, B.C.

TITLE
STOCKPILE CROSS-SECTIONS

Golder Associates

PROJECT No.	11-1422-0046.3100		FILE No.	1114220046-3100-2-8
DESIGN	JF	2016-04-07	SCALE	SCALE
CADD	MSH	2016-04-07	FIGURE	2-8
CHECK	JF	2016-04-07		
REVIEW	WM	2016-04-07		

Aggregate Project Washwater Cycle

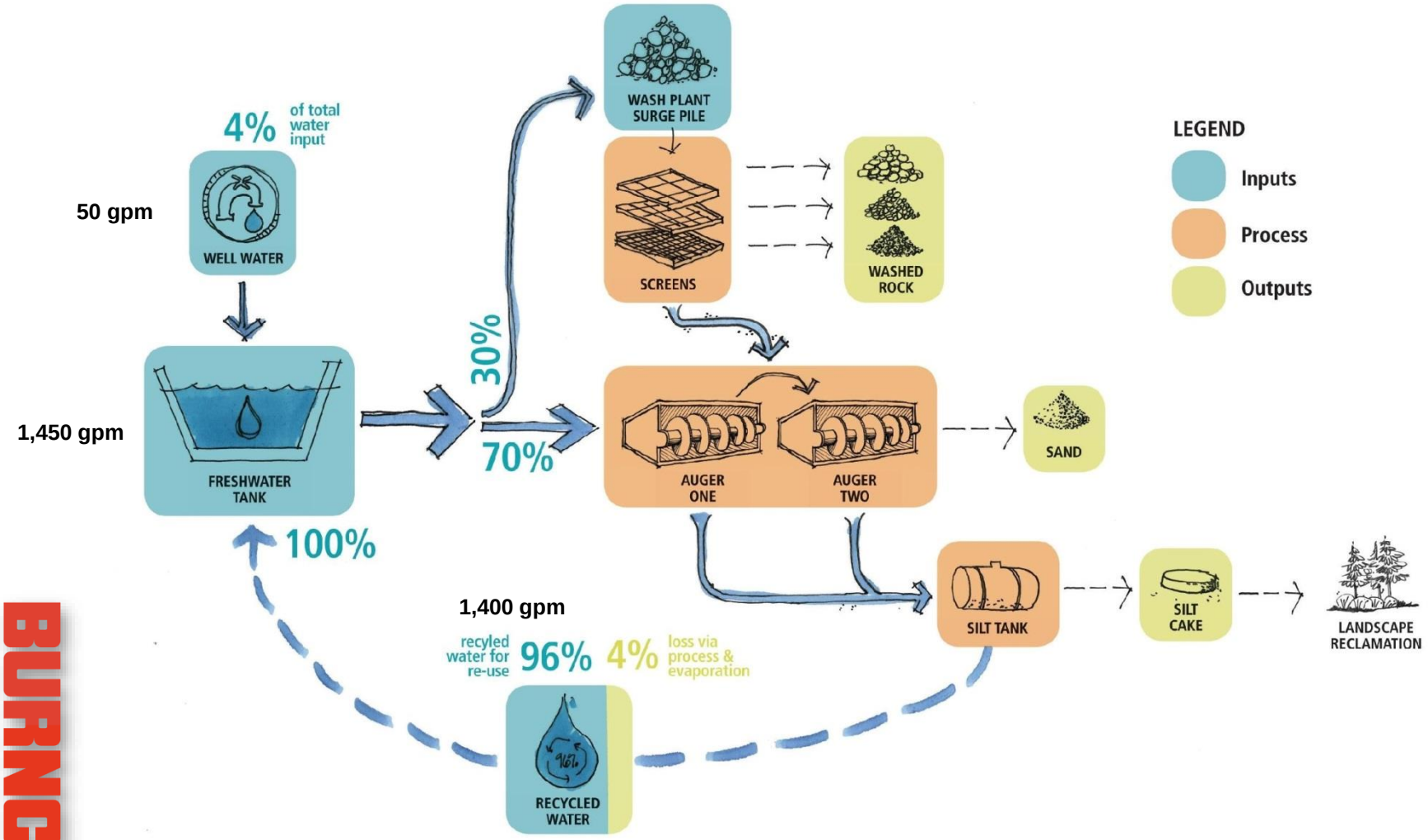


Figure 2-9: Project Washwater Cycle

3.0 ASSESSMENT PROCESS

3.1 Provincial and Federal Involvement and Issues Tracking

3.1.1 Cooperative Federal-Provincial Review

The federal and provincial EA process for the Proposed Project are cooperative, as demonstrated in this document that serves for both the federal and provincial EA review. The respective federal and provincial requirements for the Proposed Project will be met in a manner consistent with the *Canada-British Columbia Agreement for Environmental Assessment Cooperation* (2004). The process involves a single, cooperative assessment, meeting the legal requirements of both levels of government while maintaining their respective existing roles and responsibilities.

The purpose of the cooperative EA process is to minimize duplication in effort in review, consultation, conducting field studies and developing EA documentation. Under this process, the provincial and federal environmental assessment processes run parallel through the completion of technical studies and the development and review of the environmental assessment report.

Accordingly, the EAC Application/EIS was written to generate the type and quality of information and conclusions on environmental effects required by BCEAA and, concurrently, to satisfy a federal assessment under the former CEAA, on the basis of a cooperative environmental assessment.

Following completion of the review of the EAC Application/EIS, the provincial BCEAO and the federal Minister of the Environmental will make separate determinations on whether or not the Proposed Project will result in significant adverse environmental effects following mitigation. If the project is approved, the BCEAO issues an EA Certificate for a Proposed Project and the federal Minister of the Environment issues a federal Decision Statement. Following the decisions on the environmental assessment, individual permits, approvals and authorizations must still be obtained from respective federal and provincial agencies.

The sections below provide additional information regarding the provincial and federal involvement in the EA process.

3.1.2 Provincial Involvement

This section provides a brief description of how the Proposed Project is subject to BCEAA, the history of the Proposed Project in the provincial EA review process, a description of the technical working groups during the pre-Application stage of the EA process, provincial milestones achieved to date and those to come, and the provincial agencies known and/or anticipated to be involved in the EA process. A description of the participation of Aboriginal Groups in the EA review of the Proposed Project is provided in Section 3.2 below.

3.1.2.1 How the Project is Subject to BCEAA

The Proposed Project is subject to the BCEAA under Part 3 (a) of the *Reviewable Projects Regulation* as a proposed new sand or gravel pit facility that will have a production capacity of >500,000 tonnes/year of excavated sand or gravel or both sand and gravel during at least one year of its operation.

3.1.2.2 Overview of the BCEAA Process

The BC EA review process consists of two stages and is shown Figure 3-1: Pre-Application and Application Review.

Following submission of a Project Description and designation of the Proposed Project as a "reviewable project", the Pre-Application Stage includes development of the AIR/EIS Guidelines, the undertaking of discipline-specific technical effects assessments and the preparation of the EAC Application/EIS.

Once the required number of copies of the draft EAC Application/EIS are submitted, it is subject to an initial 30-day "screening" period for completeness against the contents of the approved AIR/EIS Guidelines. If the EAC Application/EIS is determined to contain the required information, it is formally accepted for an Application Review period of up to 180 days.

During the Application Review, the EAC Application/EIS is subject to detailed review by local, provincial, and federal government agencies through a Technical Working Group. Public consultation is also part of the Application Review stage, including a formal public comment period on the EAC Application/EIS. The Proponent is provided an opportunity to respond to all agency, First Nations and public comments on the EAC Application/EIS.

At the end of the Application Review stage, the BCEAO submits an Assessment Report to the Minister of Environment and the responsible minister for the sector (Minister of Energy and Mines), accompanied by recommendations. Ministers are provided 45 days to make a decision on whether or not to issue an EA Certificate for the Proposed Project (or to request further review, if needed). If an EA Certificate is granted, it is typically subject to implementation of the project-specific commitments and assurances to implement mitigation and compensatory activities.

3.1.2.3 Brief History of the Proposed Project in Provincial EA Review Process

A summary of Pre-Application and anticipated Application Review activities and **milestones** of the provincial EA review of the Proposed Project is presented in Table 3-1.

Table 3-1: Summary of Provincial EA Review of BURNCO Aggregate Project

Date	Activity / Milestone
Completed	
November 10, 2009	Submission of initial Project Description of Proposed McNab Aggregate Property to the BCEAO and the CEA Agency.
January 18, 2010	**Order issued under Section 10(1)(c) of BCEAA designating the Proposed Project as reviewable and requiring an EA Certificate.**
February 8, 2010	Submission of updated Project Description of Proposed McNab Valley Aggregate Project to the BCEAO and the CEA Agency.
June 1, 2010	**Order issued under Section 11 of BCEAA outlining the scope, procedures and methods for the environmental assessment of the Proposed Project.**
December 16, 2011	Submission of further revised Project Description to the BCEAO and the CEA Agency following discussion with Fisheries and Oceans Canada regarding potential impacts to fish and fish habitat.
January 4, 2012	Project name change request from McNab Valley Aggregate Project to the BURNCO Aggregate Project.

Date	Activity / Milestone
September 12, 2012	Draft Application Information Requirements/Environmental Impact Statement (AIR/EIS) Guidelines, Rev 0.1 submitted to BCEAO and CEA Agency for review.
November 14, 2012	Draft AIR/EIS Guidelines, Rev 0.2 submitted to BCEAO and CEA Agency for review.
January 25, 2013	Draft AIR/EIS Guidelines, Rev 0.3 submitted to BCEAO and CEA Agency for review.
February 22, 2013	First Technical Working Group meeting on the Proposed Project held at CEA Agency in Vancouver, BC
February 22, 2013	Draft AIR/EIS Guidelines, Rev 1.0 submitted to BCEAO, CEA Agency and Technical Working Group for review.
August 14, 2013	Draft AIR/EIS Guidelines, Rev 1.1 submitted to BCEAO and CEA Agency addressing Technical Working Group comments on Rev 1.0. TWG Issue Tracking submitted to BCEAO and CEA Agency.
September 4, 2013	Draft AIR/EIS Guidelines, Rev 2.0 submitted to CEA Agency addressing follow-up Technical Working Group comments on Rev 1.1 received August 30, 2013.
September 4, 2013	BCEAO provided written approval of the Open House and Public Comment Period advertisement content, format, and publication schedule.
September 9, 2013	Draft AIR/EIS Guidelines, Rev 2.1 submitted to BCEAO and CEA Agency addressing follow-up CEA Agency review of Rev 2.0. Rev 2.1 submitted for public review.
September 19, 2013 to October 19, 2013	**30-day Formal Public Comment Period on Draft AIR/EIS Guidelines**
October 1, 2013	Public Open House, Cedars Inn, Gibsons, BC
October 2, 2013	Public Open House, Gleneagles Community Centre, West Vancouver, BC
October 8, 2013	Squamish Community Meeting, Totem Hall, Squamish, BC
October 10, 2013	Squamish Community Meeting, John Braithwaite Community Centre, North Vancouver, BC
December 5, 2013	**Order issued under Section 13 of BCEAA amending the scope of the Proposed Project to include proposed barging routes and describing provisions for the BCEAO to consult with First Nations in relation to potential effects on Aboriginal Interests arising from the proposed marine barging routes.**
December 10, 2013	Teleconference with Health Canada and CEA Agency to discuss the Health Effects Assessment workplan.
December 18, 2013	**Submitted October 2013 Public Open House Summary to BCEAO and CEA Agency**
February 13, 2014	Draft AIR/EIS Guidelines, Rev 2.2 submitted to BCEAO and CEA Agency addressing comments received during formal public comment period. Revised to reflect BCEAO Guideline for the Selection of Valued Components and Assessment of Potential Effects. Public Issue Tracking submitted to BCEAO and CEA Agency. Updated TWG Issue Tracking submitted to BCEAO and CEA Agency.
February 26, 2014	Draft AIR/EIS Guidelines, Rev 2.3 submitted to BCEAO and CEA Agency addressing follow-up Technical Working Group comments received after September 9, 2013. Updated TWG Issue Tracking submitted to BCEAO and CEA Agency.
August 20, 2014	Draft AIR/EIS Guidelines, Rev 3.0 submitted to BCEAO and CEA Agency addressing Technical Working Group review of Rev 2.2. and Rev 2.3 and associated responses to public and Technical Working Group comments.
December 3, 2014	Draft AIR/EIS Guidelines, Rev 3.1 submitted to BCEAO and CEA Agency addressing CEA Agency review of Rev 3.0. Appendix A revised to provide supplemental VC and Study Area rationales in response to September 22, 2014 request from the Squamish Nation and November 19, 2014 direction from BCEAO and the CEA Agency.

Date	Activity / Milestone
December 16, 2014	**Approved AIR/EIS Guidelines issued to BURNCO Rock Products Ltd. by BCEAO.**
January 15, 2015	Workshop discussion with DFO and CEA Agency regarding proposed fish habitat offset requirements and design.
February 10, 2015	Technical Working Group: Fisheries Subcommittee meeting to discuss proposed fish habitat offset concept.
April 13, 2015	**Order issued under Section 13 of BCEAA amending the procedures to specify that the Application Review will include at least one formal public comment period of at least 45 days.**
April 20, 2015	BCEAO and CEA Agency EA process workshop.
May 15, 2015	Draft Public Consultation and Communication Plan submitted to BCEAO and CEA Agency
October 8, 2015	Pre-Application Meeting with MMPO to present Project Overview and status of EA and related permitting, and to discuss process and steps required to permit the Project.
November 14, 2015	Pre-Application meeting to introduce MEM to the proposed BURNCO Aggregate Mine Project and for MEM technical staff to provide specific feedback regarding *Mines Act* permit application information requirements.
December 16, 2016	Revised draft Consultation and Communication Plan submitted to BCEAO and CEA Agency responding to comments received from BCEAO on June 29, 2015.
December 31, 2015	Final Consultation and Communication Plan submitted to BCEAO and CEA Agency for approval.
January 8, 2016	Draft First Nations Pre-Application Consultation Report submitted to BCEAO, CEA Agency and Aboriginal Groups for review and comment.
January 12, 2016	**Revised Final Consultation and Communication Plan submitted to BCEAO and CEA Agency responding to comments received from BCEAO on January 11, 2016. Plan accepted and posted to ePIC February 3, 2016.**
January 14, 2016	Pre-Application meeting with BC Hydro and MMPO to discuss BC Hydro components of BURNCO Aggregate permitting Project
January 20, 2016	Technical Working Group: Fisheries Subcommittee meeting to discuss the fish and fish habitat environmental assessment and Fish Habitat Offset Plan.
February 15, 2016	**First Nations Pre-Application Consultation Report submitted to BCEAO and CEA Agency.**
February 16, 2016	BURNCO meeting with BCEAO to provide a project overview to new BCEAO Project Lead, discuss Part C Aboriginal Effects Assessment and key issues.
April 7, 2016	Pre-Application meeting to present the Reclamation and Effective Closure Plan and Erosion and Sediment Control Plan for proposed BURNCO Aggregate Project to MEM and FLNRO Technical Reviewers to discuss permit application requirements.
April 22, 2016	Pre-Application meeting with MMPO to introduce new MMPO staff to the proposed BURNCO Aggregate Project and discuss the MMPO Project Charter and permit application requirements.
Anticipated	
April 2016	**Submission of Draft EAC Application/EIS to BCEAO and CEA Agency for Screening**
May 2016	30-Day Screening of EAC Application/EIS
May 2016	Submit Public Information Session consultation materials to BCEAO and CEA Agency to review and approve, including Public Notice, Letter to identified Stakeholder Groups, storyboards and presentation materials.

Date	Activity / Milestone
June 2016	**EAC Application/EIS accepted for review by BCEAO and CEA Agency. Final EAC Application/EIS submitted. Meeting with Technical Working Group.**
June 2016	Meetings/site tours with MLAs, identified Stakeholder Groups, others.
June/July 2016	**45-day Formal Public Comment Period. Public Information Sessions held within 2 weeks of the start of the Public Comment Period.**
August 2016	Proponent responds to public issues and submits Final Public Consultation and Communications Report within 30 days of close of the 45-day Public Comment Period.
September 2016	Technical Working Group completes review of EAC Application/EIS
October 2016	Proponent responds to Technical Working Group comments. BCEAO prepares Assessment Report.
November 2016	**BCEAO conclusions and recommendations to Ministers**
December 2016/ January 2017	**Ministers' decision**

3.1.2.4 Agencies and First Nations Involvement in the EA Review Process

The following local, provincial and federal agencies and First Nations are involved in the EA Review of the Proposed Project:

Local Government

- Sunshine Coast Regional District
- Metro Vancouver
- Bowen Island Municipality
- Islands Trust

Provincial

- BC Environmental Assessment Office
- BC Ministry of Energy and Mines
- BC Ministry of Environment
- BC Ministry of Forest, Lands and Natural Resource Operations
- Vancouver Coastal Health

Federal

- Canadian Environmental Assessment Agency
- Fisheries and Oceans Canada
- Natural Resources Canada
- Health Canada
- Transport Canada
- Environment Canada

First Nations

- S*kwxwú7mesh* (Squamish) Nation; and
- Tsleil-Waututh Nation.

Representatives from each of the above agencies or First Nations are represented on the Technical Working Group (TWG) established by BCEAO to review the assessment. The TWG met only once during the Pre-Application stage of the EA Review on February 22, 2013. Many of the TWG participants also attend a BCEAO and CEA Agency EA process workshop on April 20, 2015.

The TWG had substantial involvement in the development of the AIR/EIS Guidelines and other aspects of the assessment. A listing of written submissions received from TWG participants during Pre-Application is presented in Table 3-2. An issues tracking table that describes issues and concerns raised in these submissions and the degree to which they have been considered or addressed is provided in Volume 4, Part G – Section 22.0: Appendix 2-A.

Subsequent to the Approved AIR/EIS Guidelines being issued on December 16, 2014, a TWG Fisheries Sub-Committee was formed to focus on issues related to potential effects on fish and fish habitat. The TWG Fisheries Sub-Committee met on February 10, 2015 to review the fish habitat offset plan concept and again on January 20, 2016 to review the conclusions of the fish and fish habitat assessment.

Table 3-2: Listing of TWG Written Submissions during Pre-Application

Submission No.	Date	Organization	Subject of Review
1	18-Mar-13	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
2	2-Apr-13	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)

Submission No.	Date	Organization	Subject of Review
3	5-Apr-13	Ministry of Jobs, Tourism and Skills Training, Tourism Strategy and Policy	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
4	8-Apr-13	Ministry of Energy, Mines and Natural Gas, Geotechnical Engineering	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
5	9-Apr-13	Vancouver Coastal Health	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
6	12-Apr-13	Sunshine Coast Regional District	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
7	15-Apr-13	Transport Canada	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
8	15-Apr-13	Environment Canada	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
9	12-Apr-13	Ministry of Environment, Environmental Protection	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
10	23-Apr-13	Fisheries and Oceans Canada	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
11	3-May-13	Islands Trust Northern Office	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
12	10-May-13	Ratcliffe and Company on behalf of Squamish Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
13	31-May-13	Tsleil-Waututh Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
14	20-Jun-13	Health Canada	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
15	27-Jun-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
16	27-Jun-13	British Columbia Environmental Assessment Office	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
17	2-Aug-13	Tsleil-Waututh Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
18	12-Aug-13	Squamish Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
19	28-Aug-13	Vancouver Coastal Health	Draft AIR/EIS Guidelines, Rev 1.1 (14Aug2013)
20	28-Aug-13	British Columbia Environmental Assessment Office	Draft AIR/EIS Guidelines, Rev 1.1 (14Aug2013)
21	30-Aug-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 1.1 (14Aug2013)
22	9-Sep-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.0 (04Sept2013)
23	27-Sep-13	Sunshine Coast Regional District	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
24	3-Oct-13	Transport Canada	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
25	7-Oct-13	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
26	8-Oct-13	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
27	9-Oct-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)

Submission No.	Date	Organization	Subject of Review
28	18-Oct-13	Natural Resources Canada	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
29	12-Nov-13	Health Canada	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
30	12-Nov-13	Fisheries and Oceans Canada	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
31	12-Nov-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
32	21-Nov-13	Ministry of Environment, Environmental Protection	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
33	2-Dec-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
34	24-Dec-13	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.1 (09Sept2013)
35	10-Mar-14	Ministry of Environment, Environmental Protection	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
36	13-Mar-14	Metro Vancouver	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
37	25-Mar-14	Islands Trust Gambier Local Trust Committee	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
38	27-Mar-14	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
39	27-Mar-14	Fisheries and Oceans Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
40	27-Mar-14	Health Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
41	27-Mar-14	Transport Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
42	27-Mar-14	Environment Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
43	27-Mar-14	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
44	28-Mar-14	Sunshine Coast Regional District	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
45	28-Mar-14	Squamish Nation	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
46	4-Apr-14	Tsleil-Waututh Nation	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
47	14-Apr-14	Ministry of Energy and Mines, Mines and Mineral Resources Division	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
48	7-Jul-14	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
49	7-Jul-14	Transport Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
50	10-Jul-14	Fisheries and Oceans Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
51	14-Jul-14	Health Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
52	31-Jul-14	Health Canada	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
53	18-Aug-14	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)

Submission No.	Date	Organization	Subject of Review
54	8-Sep-14	Sunshine Coast Regional District	Refinements to the size and orientation of on-site components (05August2014)
55	12-Sep-14	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Refinements to the size and orientation of on-site components (05August2014)
56	18-Sep-14	Islands Trust Gambier Local Trust Committee	Refinements to the size and orientation of on-site components (05August2014)
57	22-Sep-14	Squamish Nation	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
58	1-Oct-14	Tsleil-Waututh Nation	Refinements to the size and orientation of on-site components (05August2014)
59	10-Oct-14	Sunshine Coast Regional District	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
60	19-Nov-14	British Columbia Environmental Assessment Office	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
61	19-Nov-14	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
62	19-Nov-14	Canadian Environmental Assessment Agency	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
63	7-May-15	Ministry of Environment, Environmental Protection Authorizations - South	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
64	10-Jun-15	Fisheries and Oceans Canada	Draft Fish Habitat Offset Plan (20May2015)
65	10-Jun-15	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft Fish Habitat Offset Plan (20May2015)
66	23-Jun-15	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft Fish Habitat Offset Plan (20May2015)
67	23-Jun-15	Canadian Environmental Assessment Agency	Draft Fish Habitat Offset Plan (20May2015)
68	24-Jun-15	Ministry of Natural Resource Operations (FLNRO), South Coast Region Authorizations (Water Allocation)	Draft Fish Habitat Offset Plan (20May2015)
74	19-Jan-16	Tsleil-Waututh Nation	Draft Part C Aboriginal Information Requirements and Pre-Application Consultation Report (11Jan2016)
77	29-Jan-16	Tsleil-Waututh Nation	Draft Part C Aboriginal Information Requirements and Pre-Application Consultation Report (11Jan2016)

BURNCO will continue to consult with government agencies and resolve any outstanding issues through the established TWG and TWG Subcommittee process during Application Review as described in Table 3-1.

3.1.2.5 Aboriginal Groups Participation in the EA Review Process

S*kwx̱wú7mesh* (Squamish) Nation and Tsleil-Waututh Nation have participated as full members of the Technical Working Group and TWG Fisheries Sub-Committee and have been involved in the review of the AIR/EIS Guidelines as well as the development and review of components of the EAC Application/EIS. The nature and extent of their involvement, as well as the involvement of other identified First Nations is presented in Section 3.2.

A listing of written submissions received from Aboriginal Groups during Pre-Application is presented in Table 3-3. An issues tracking table that describes issues and concerns raised in these submissions and the degree to which they have been considered or addressed is provided in Volume 4, Part G – Section 22.0: Appendix 2-B.

Table 3-3: Listing of Written Submissions from Aboriginal Groups during Pre-Application

Submission No.	Date	Organization	Subject of Review
12	10-May-13	Ratcliffe and Company on behalf of Squamish Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
13	31-May-13	Tsleil-Waututh Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
17	2-Aug-13	Tsleil-Waututh Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
18	12-Aug-13	Squamish Nation	Draft AIR/EIS Guidelines, Rev 1.0 (22Feb2013)
45	28-Mar-14	Squamish Nation	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
46	4-Apr-14	Tsleil-Waututh Nation	Draft AIR/EIS Guidelines, Rev 2.3 (26Feb2014)
57	22-Sep-14	Squamish Nation	Draft AIR/EIS Guidelines, Rev 3.0 (20Aug2014)
58	1-Oct-14	Tsleil-Waututh Nation	Refinements to the size and orientation of on-site components (05August2014)
69	18-Nov-15	Métis Nation BC	Draft Part C Aboriginal Information Requirements, Baseline (17Nov2017)
70	30-Nov-15	Penelekut Tribe	Draft Part C Aboriginal Information Requirements, Baseline (17Nov2017)
71	1-Dec-15	Penelekut Tribe	Draft Part C Aboriginal Information Requirements, Baseline (17Nov2017)
72	1-Dec-15	Penelekut Tribe	Draft Part C Aboriginal Information Requirements, Baseline (17Nov2017)
73	12-Jan-16	Penelekut Tribe	Draft Part C Aboriginal Information Requirements, Baseline (17Nov2017)
74	19-Jan-16	Tsleil-Waututh Nation	Draft Part C Aboriginal Information Requirements and Pre-Application Consultation Report (11Jan2016)
75	21-Jan-16	Cowichan Tribes	Draft Part C Aboriginal Information Requirements, Baseline (17Nov2017)
76	22-Jan-16	Penelekut Tribe	Draft Part C Aboriginal Information Requirements and Pre-Application Consultation Report (11Jan2016)
77	29-Jan-16	Tsleil-Waututh Nation	Draft Part C Aboriginal Information Requirements and Pre-Application Consultation Report (11Jan2016)

3.1.3 Federal Involvement

This section provides a description of how the Proposed Project is subject to the former CEAA, the history of the Proposed Project in the federal EA review process, federal milestones achieved to date and those to come, and the federal agencies known and/or anticipated to be involved in the EA process. A review of all applicable federal legislation and guidelines is also provided; how they are addressed in the Application is provided in Part D.

3.1.3.1 How the Proposed Project is Subject to the Former CEAA

The former CEAA provides a framework for review by the federal authorities of the environmental effects resulting from the construction, operation, modification, reclamation, closure, and abandonment of projects in Canada. The purpose of the CEAA is to support sustainable development by providing a framework that promotes the avoidance and/or reduction of the potential impact of a proposed project on the environment before it begins and endorses the implementation of effective mitigation once a project is initiated.

The Notice of Commencement for the BURNCO Aggregate Mine Project EA was posted to the Canadian Environmental Assessment Registry (CEAR) on April 28, 2010, prior to the implementation of the current CEAA 2012. The Proposed Project is therefore subject to the transitional provisions of the CEAA requiring that the Proposed Project continue to be assessed under the former CEAA (1992). Under Section 5 of the *former CEAA,* an environmental assessment may be required if a Federal Authority (FA) is required to provide a license, permit, certificate or other regulatory authorization designated under the *Law List Regulations* (1994). Following consultation with the CEA Agency, it was determined that the Proposed Project triggers an EA under the former CEAA as an authorization by Fisheries and Oceans Canada (DFO) under subsection 35(2) of the *Fisheries Act* is anticipated (Schedule 1, Part 1, Section 6 of the *Law List Regulations*).

Prior to the full CEAA 2012 coming in to force, a series of amendments to the Act were enacted on July 12, 2010 changing three operational items regarding the BURNCO Aggregate Mine Project EA process:

1) The CEA Agency became a responsible authority (RA) for the Project; and

2) The comprehensive study (trigger described below) would continue under the former CEAA but a comprehensive study report must be provided to the Minister no later than six months of government time after CEAA 2012 comes into force Figure 3-2; and

3) The CEA Agency was required to provide the public with the opportunity to comment on the Project and the conduct of the comprehensive study.

The former CEAA and its regulations provide four EA review options: screenings, comprehensive studies, mediation and panel review. Based on the Project Description submitted by the Proponent, the CEA Agency determined that a comprehensive study would be required as the proposed production capacity of the BURNCO Aggregate Mine (max.1,500,000 million tonnes per year) would exceed the annual threshold specified in the *Comprehensive Study List Regulations* (i.e., >1,000,000 tonnes per year).

3.1.3.2 History of the Proposed Project in Federal EA Review Process

As a major resource development project in Canada, the federal government's Major Projects Management Office (MPMO) has administrative and advisory responsibilities associated with the Proposed Project under the *Cabinet Directive on Improving the Performance of the Regulatory System for Major Resource Projects* (2012) and the associated Memorandum of Understanding (MOU). The MPMO will provide oversight and advice throughout the federal review in relation to the Proposed Project. The CEA Agency will exercise the powers and perform the duties and functions of the Responsible Authority (RA) in relation to the Proposed Project until the Minister of the Environment is provided with the comprehensive study report. In addition, the CEA Agency has administrative responsibilities, will act as the EA Manager and as the Crown Consultation Coordinator (CCC), and will coordinate federal input into the provincial EA, to the extent possible for the Proposed Project.

Each major resource project progressing through the federal regulatory system administered by the MPMO is accompanied by a Project Agreement. The Project Agreement for the BURNCO Aggregate Mine Project final signature was obtained on February 15, 2012 (CEA Agency 2012a).

The Notice of Commencement for the BURNCO Aggregate Mine Project EA was posted to the CEAR on April 28, 2010 following the submission of the Project Description to the CEA Agency.

As a result of a series of amendments to the CEAA enacted on July 12, 2010, an updated Notice of Commencement was posted on the CEAR On January 3, 2012 to allow for a 30-day public consultation process on the Proposed Project and the conduct of the EA process. The CEA Agency provided the public with a summary document entitled "Background Document supporting Public Participation Opportunity #1 In accordance with the *Canadian Environmental Assessment Act,* Proposed Project: BURNCO Aggregate Mine Project, Howe Sound, BC" (CEA Agency 2012b) outlining the proposed scope of the potential environmental effects to be considered for the federal portion of the EA as per Section 16 (1) of the former CEAA. A draft Application Information Review (AIR)/Environmental Impact Statement (EIS) Guidelines was submitted to the CEA Agency on September 12, 2012 and following edits from comment made from CEA Agency and the BC EAO a subsequent draft was provided to the public for review and comment through the provincial assessment process (See Section 3.1.2). A final version of the AIR/EIS was issued by the BC EAO and CEA Agency on December 16, 2014.

The federal comprehensive study process is presented in Figure 3-1. A summary of activities and **milestones** of the federal EA review of the Proposed Project is presented in Table 3-4.

Table 3-4: Summary of Federal EA Review of BURNCO Aggregate Project

Date	Activity / Milestone
Completed	
November 10, 2009	Submission of initial Project Description of Proposed McNab Aggregate Property to the BCEAO and the CEA Agency.
April 28, 2010	**Notice of Commencement of Comprehensive Study. Updated on January 3, 2012.**
February 8, 2010	Submission of updated Project Description of Proposed McNab Valley Aggregate Project to the BCEAO and the CEA Agency.
December 16, 2011	Submission of further revised Project Description to the BCEAO and the CEA Agency following discussion with Fisheries and Oceans Canada regarding potential impacts to fish and fish habitat.

Date	Activity / Milestone
January 3, 2012	Public participation notice posted federally and Aboriginal groups notified by CEA Agency.
January 3 to February 3, 2012	**First Federal Public Consultation Period**
February 15, 2012	**Project Agreement for the BURNCO Aggregate Mine in British Columbia. Available online: http://mpmo.gc.ca/projects/32.**
September 12, 2012	Draft Application Information Requirements/Environmental Impact Statement (AIR/EIS) Guidelines, Rev 0.1 submitted to BCEAO and CEA Agency for review.
November 14, 2012	Draft AIR/EIS Guidelines, Rev 0.2 submitted to BCEAO and CEA Agency for review.
January 25, 2013	Draft AIR/EIS Guidelines, Rev 0.3 submitted to BCEAO and CEA Agency for review.
February 22, 2013	First Technical Working Group meeting on the Proposed Project held at CEA Agency in Vancouver, BC
February 22, 2013	Draft AIR/EIS Guidelines, Rev 1.0 submitted to BCEAO, CEA Agency and Technical Working Group for review.
August 14, 2013	Draft AIR/EIS Guidelines, Rev 1.1 submitted to BCEAO and CEA Agency addressing Technical Working Group comments on Rev 1.0. TWG Issue Tracking submitted to BCEAO and CEA Agency.
September 4, 2013	Draft AIR/EIS Guidelines, Rev 2.0 submitted to CEA Agency addressing follow-up Technical Working Group comments on Rev 1.1 received August 30, 2013.
September 9, 2013	Draft AIR/EIS Guidelines, Rev 2.1 submitted to BCEAO and CEA Agency addressing follow-up CEA Agency review of Rev 2.0. Rev 2.1 submitted for public review.
November 12, 2013	CEA Agency determined that the marine shipping component of the Proposed Project for the purpose of the comprehensive study will include barge traffic in Howe Sound, Ramillies Channel, Thornbrough Channel and Queen Charlotte Channel (south of Passage Island). The scope will not include shipping from where the barges meet the existing shipping lanes in the Strait of Georgia an in the Fraser River to BURNCO's existing facilities in Burnaby and Langley.
December 10, 2013	Teleconference with Health Canada and CEA Agency to discuss the Health Effects Assessment workplan.
December 18, 2013	Submitted October 2013 Public Open House Summary to BCEAO and CEA Agency
February 13, 2014	Draft AIR/EIS Guidelines, Rev 2.2 submitted to BCEAO and CEA Agency addressing comments received during formal public comment period. Revised to reflect BCEAO Guideline for the Selection of Valued Components and Assessment of Potential Effects. Public Issue Tracking submitted to BCEAO and CEA Agency. Updated TWG Issue Tracking submitted to BCEAO and CEA Agency.
February 26, 2014	Draft AIR/EIS Guidelines, Rev 2.3 submitted to BCEAO and CEA Agency addressing follow-up Technical Working Group comments received after September 9, 2013. Updated TWG Issue Tracking submitted to BCEAO and CEA Agency.
August 20, 2014	Draft AIR/EIS Guidelines, Rev 3.0 submitted to BCEAO and CEA Agency addressing Technical Working Group review of Rev 2.2 and Rev 2.3 and associated responses to public and Technical Working Group comments.
December 3, 2014	Draft AIR/EIS Guidelines, Rev 3.1 submitted to BCEAO and CEA Agency addressing CEA Agency review of Rev 3.0. Appendix A revised to provide supplemental VC and Study Area rationales in response to September 22, 2014 request from the Squamish Nation and November 19, 2014 direction from BCEAO and the CEA Agency.
December 16, 2014	**Approved AIR/EIS Guidelines issued to BURNCO Rock Products Ltd. by CEA Agency.**

Date	Activity / Milestone
January 15, 2015	Workshop discussion with DFO and CEA Agency regarding proposed fish habitat offset requirements and design.
February 10, 2015	Technical Working Group: Fisheries Subcommittee meeting to discuss proposed fish habitat offset concept.
April 20, 2015	BCEAO and CEA Agency EA process workshop.
May 15, 2015	Draft Public Consultation and Communication Plan submitted to BCEAO and CEA Agency
December 16, 2016	Revised draft Consultation and Communication Plan submitted to BCEAO and CEA Agency responding to comments received from BCEAO on June 29, 2015.
December 31, 2015	Final Consultation and Communication Plan submitted to BCEAO and CEA Agency for approval.
January 8, 2016	Draft First Nations Pre-Application Consultation Report submitted to BCEAO, CEA Agency and Aboriginal Groups for review and comment.
January 12, 2016	**Revised Final Consultation and Communication Plan submitted to BCEAO and CEA Agency responding to comments received from BCEAO on January 11, 2016.**
January 20, 2016	Technical Working Group: Fisheries Subcommittee meeting to discuss the fish and fish habitat environmental assessment and Fish Habitat Offset Plan.
February 15, 2016	**First Nations Pre-Application Consultation Report submitted to BCEAO and CEA Agency.**
Anticipated	
April 2016	**Submission of Draft EAC Application/EIS to BCEAO and CEA Agency for Screening**
May 2016	30-Day Screening of EAC Application/EIS by CEA Agency to ensure the requirements of the EIS Guidelines are met.
May 2016	Submit Public Information Session consultation materials to BCEAO and CEA Agency to review and approve, including Public Notice, Letter to identified Stakeholder Groups, storyboards and presentation materials.
June 2016	**EAC Application/EIS accepted for review by BCEAO and CEA Agency.**
To be determined by the Proponent	**Final Complete EAC Application/EIS submitted.**
45 days, from posting by BCEAO of accepted EAC Application/EIS for public comment	**45-day Formal Public Comment Period. Public Information Sessions held within 2 weeks of the start of the Public Comment Period.**
52 days from posting of accepted EAC Application/EIS for public comment	CEA Agency undertake Aboriginal consultation on the EAC Application/EIS.
Within 8 weeks from acceptance of EAC Application/EIS	Technical Working Group completes review of EAC Application/EIS. CEA Agency review and provide comments on the EAC Application/EIS to the Proponent.
To be determined by the Proponent (est. October 2016)	Proponent responds to Technical Working Group comments and submits EAC Application/EIS addendum information to respond to TWG comments.
Within 3 weeks from the submission of an EAC Application/EIS addendum by the Proponent (est. November 2016)	Review the Proponent's EAC Application/EIS addendum for completeness. To be completed within 3 weeks of the submission of the EAC Application/EIS addendum.
Within 7 weeks from the acceptance of the EAC	CEA Agency prepare draft Comprehensive Study Report (CSR).

Date	Activity / Milestone
Application/EIS addendum information as complete	
Within 4 weeks from the circulation of the draft CSR	RAs and expert FAs review draft CSR. To be completed within 4 weeks from the circulation of the draft CSR. CEA Agency to consult with Aboriginal Groups on draft CSR concurrently.
Within 4 weeks from the provision of federal comments on the draft CSR	**CEA Agency submit final CSR to the Minister of the Environment.**
Within 3 days from the submission of the final CSR to the Minister of the Environment	CEA Agency post final CSR for public and Aboriginal comment on the Canadian Environmental Assessment Registry (CEAR).
4 weeks, starting from the posting of the final CSR	Public comment period on the final CSR by CEA Agency.
4 weeks, starting from the posting of the final CSR	Aboriginal consultation on the final CSR by CEA Agency.
Within 12 weeks from the close of the comment period on the final CSR	**CEAA Agency post the Notice of the Minister of the Environment's EA Decision Statement on the CEAR.**
Within 3 weeks from the Minister's EA Decision Statement being posted on the CEAR	**RA post the EA course of action decisions on CEAR.**

Prior to the initiation of the environmental assessment of the Proposed Project, BURNCO consulted with DFO regarding the nature and extent of potential effects of the Proposed Project on fish and fish habitat, and to discuss habitat offsetting options. Consultation activities included telephone conversations, the submission of technical memoranda and presentations on the fisheries productivity of the watercourse to be removed/lost as a result of the Proposed Project (WC 2) and offsetting options to offset that loss. The federal EA process formally commenced on January 18, 2010 following a kick-off meeting with DFO held on December 17, 2009. On June 16, 2010, DFO advised BURNCO that, based on the initial Proposed Project application and review, the Proposed Project as proposed was likely to result in significant effects to fish and fish habitat and a *Fisheries Act* authorization would not be issued. This standard template decision letter also recommended that the Proponent relocation/redesign the Proposed Project to reduce effects to fish and fish habitat. BURNCO subsequently requested a review of this decision under the appeal provisions of DFO's *Policy for the Management of Fish Habitat*. On August 12, 2010 DFO agreed to have the Proposed Project and new information submitted by BURNCO reviewed again, including both technical and policy considerations. DFO's review team considered applicable legislation, DFO's policies and guidance to staff for Fish Habitat Management, all information submitted by BURNCO, a site visit, interviews and documents from DFO staff in the Major Projects Unit, Stock Assessments, Fisheries and Aquaculture Management, and a contracted hydrogeological expert. DFO completed its supplemental review of the Proposed Project on March 11, 2011. Although there remained uncertainty as to whether a *Fisheries Act* Authorization could be issued, the review team recommended that the proponent be provided the opportunity to continue with the review process.

Following a meeting with DFO on April 20, 2011, BURNCO committed to undertake a detailed engineering design and analysis to support its habitat offsetting program in order to achieve no net loss[12] of habitat by offsetting with habitat of similar function and effectiveness on the Proposed Project site or on nearby fee simple lands.

On June 27, 2011, DFO wrote to BURNCO to outline concerns about the Proposed Project's effect on fish and fish habitat. Golder and BURNCO commenced a series of investigative studies in and around the Proposed Project Area regarding fish, fish habitats, surface and groundwater, as well as operational and mitigation planning to examine and understand potential Proposed Project-related effects to fish and fish habitat and approaches to avoid and/or reduce those effects. Five main concerns were outlined in this letter, how these concerns are addressed in the EAC Application/EIS are as follows:

1) "The proposed works will negatively impact fish habitat, consistent with the original High Risk ranking for the project. The extent of the impact is likely significantly greater than currently presented by BURNCO" BURNCO undertook several studies to understand the potential effects related to the Proposed Project on fish and fish habitat, this includes a mass-balance water quality model, hydrogeological model and a hydrodynamic model of the pit lake. Details regarding these models are provided in Volume 4, Part G – Section 22.0: Appendix 5.5-B, 5.5-D, and 5.6-D. The outcome of these models were used to assess the potential Project-related effects to fish and fish habitat which is provided in Volume 2, Part B – Section 5.1: Fisheries and Freshwater Habitat assessment.

2) "The assessments conducted to date [i.e., late 2010] by the proponent are not sufficient to completely characterize all of the impacts to fish and fish habitat" The models described above were completed in order to satisfy this concern. Additional Proposed Project design elements were used to avoid and reduce the potential effects to fish and fish habitat. These are described in Volume 2, Part B – Section 5.1.

3) "Risks of avulsion for McNab Creek, saltwater intrusion, and to marine mammals – DFO acknowledges these are less than originally anticipated" An assessment of avulsion risk was conducted and is described in Volume 4, Part G – Section 22.0: Appendix 5.4-A. The potential for saltwater intrusion is considered in the surface water effects assessment and the hydrogeological model (Volume 2, Part B – Section 5.5 and Volume 4, Part G – Section 22.0: Appendix 5.6-D). Potential Project related effects on marine mammals is described in Volume 2, Part B – Section 5.2.

4) "Options for adequate fish habitat compensation within McNab Creek or greater Howe Sound are severely limited and may not allow the proposed development to meet DFO's fish habitat policy objectives, including "No Net Loss" guiding principles" A draft Fish Habitat Offset Plan is provided in Volume 4, Part G – Section 22.0: Appendix 5.1-B. The plan was designed to offset the loss of habitat at a high ratio (i.e., more habitat created than will be lost).

5) "The pit design detail and water/wastewater management plan require further development" The use and recycling of water for the Proposed Project is described above in Section 2.5.1.

[12] Now discussed in terms of effective measures to offset serious harm to fish that are part of or that support a commercial, recreational or Aboriginal fishery, consistent with the fisheries protection provisions of Canada's *Fisheries Act*

In addition to these general concerns outlined by DFO, five specific areas of interest have been identified by BURNCO. Table 3-5 summarizes these areas of interest and where they are addressed in the EAC Application/EIS.

Table 3-5: Key Areas of Interest Related to Fish and Fish Habitat Effects of the Proposed Project

Potential effects on:	Summary	EAC Application /EIS Reference
Harlequin Creek	There are no proposed works in or drainages to Harlequin Creek. No flow changes to the creek are predicted.	Volume 2, Part B – Section 5.1
The freshwater inlets along the foreshore	There are no proposed works in these watercourses. A slight increase in flow is predicted to these watercourses.	Volume 2, Part B – Section 5.1 and Volume 2, Part B – Section 5.5
The upper and lower portions of the groundwater-fed watercourse (WC 2)	Removal of the upper segment of WC 2 will result in habitat loss. Reductions in flow in the lower segment of WC 2 will result in a decrease in wetted area.	Volume 2, Part B – Section 5.1 and Volume 4, Part G – Section 22.0: Appendix 5.1-B
Low flow conditions of McNab Creek	Baseflows in McNab Creek are predicted to remain above baseline conditions during operations and after reclamation and closure.	Volume 2, Part B – Section 5.5
Water management along the western slopes of the property	There are no proposed works in the watercourses around the western slope of the property. No potential effects to surface water were identified. How water will be managed at the site is described above in Section 2.5.1 and in the other section referenced in column 3 of this table.	Volume 2, Part B – Section 5.5 Volume 2, Part B – Section 5.6

The assessment of potential effects to fish and fish habitat including offsetting options for the freshwater environment is provided in Volume 2, Part B - Section 5.1. The marine fish assessment is provided in Volume 2, Part B - Section 5.2.

3.1.3.3 Federal Agencies Involved

Table 3-6 summarizes the federal agencies, their role, and reasoning for their involved in the review of the EA.

Table 3-6: Federal Agency Roles for the Proposed Project

Agency	Role	Reasoning
Canadian Environmental Assessment Agency	Performs duties and functions of the Responsible Authority (RA). Coordinates the federal EA process for major projects, provide funding to support public participation, and to coordinate consultation efforts with Aboriginal groups and between federal departments.	As a result of the amendments to the CEAA enacted on July 12, 2010 the CEA Agency is playing an enhanced role in the EA of the Proposed Project as it will perform the duties and functions of the RA until the submission of the comprehensive study report to the Minister of the Environment.

Agency	Role	Reasoning
Fisheries and Oceans Canada (DFO)	RA	An authorization by Fisheries and Oceans Canada (DFO) under the *Fisheries Act* is anticipated. DFO may be in possession of specialist or expert information or knowledge with respect to the Proposed Project and, on request, shall make available that information or knowledge to the CEA Agency during the review process.
Transport Canada (TC)	Federal Authority (FA)	Administers the *Navigation Protection Act, Canadian Shipping Act and the TDG Act* (Described below).
Environment and Climate Change Canada (ECCC)	FA	Administers the *Canada Wildlife Act, Migratory Birds Convention Act and the Species at Risk Act.* May be in possession of specialist or expert information regarding : ▪ Migratory birds; ▪ SARA species; ▪ Wetlands; and, ▪ Water quality, including: ▪ Receiving water quality ▪ Air quality; ▪ Chemicals management; ▪ Environmental emergencies; and ▪ Greenhouse Gas Emissions with respect to the Proposed Project and, on request, shall make available that information or knowledge to the CEA Agency during the review process
Natural Resource Canada	FA	May be in possession of specialist or expert information regarding: ▪ hydrogeology; ▪ geohazards; and ▪ minerals and metals science With respect to the Proposed Project and, on request, shall make available that information or knowledge to the CEA Agency during the review process.
Health Canada	FA	May be in possession of specialist or expert information regarding: ▪ Air quality health effects; ▪ Contamination of country foods (e.g., fish, wild game, garden produce, berries, etc.); ▪ Drinking and recreational water quality; ▪ Radiation effects; ▪ Electric and magnetic fields; ▪ Noise impacts; ▪ Health risk assessment and risk management; ▪ Federal air, water, and soil quality guidelines/standards used in human health risk assessments; and ▪ Toxicology (multimedia - air, water, soil). With respect to the Proposed Project and, on request, shall make available that information or knowledge to the CEA Agency during the review process.

Agency	Role	Reasoning
Aboriginal Affairs and Northern Development Canada (AANDC)	FA	Advisory responsibilities to support the Government of Canada's Aboriginal consultation activities in relation to the Proposed Project.
Major Project Management Office	Provides guidance and support to proponents by coordinating project agreements, timelines and federal departments and agencies, as well as track and monitor the progress of projects through the federal regulatory process.	Administrative and advisory responsibilities under the Cabinet Directive on Improving the Performance of the Regulatory System for Major Resource Projects and the associated Memorandum of Understanding (MOU). The MPMO will provide oversight and advice throughout the entire federal review in relation to the Proposed Project to ensure adherence to the service standards and roles and responsibilities of all Parties.
Minister of the Environment	N/A	Issues the EA Decision Statement

3.1.3.4 Other Applicable Federal Legislation

In addition to the former CEAA, other relevant federal legislation and the reason they apply to the Proposed Project are provided in Table 3-7.

Table 3-7: Summary of Federal Legislation applicable to the BURNCO Aggregate Project

Act	Regulation (include but not limited to)	Trigger
Fisheries Act (1985) (amended 2012)	*Marine Mammal Regulations*	Required if the work, undertaking or activity will likely results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. A Section 35 *Fisheries Act* Authorizations likely required for the Proposed Project due to the removal of the upper segment of WC 2, road crossings of fish bearing streams, and potentially associated with the marine based structures associated with the conveyor and barging activities. *Marine mammal regulations* will be adhered to with respect to the construction of marine structures and the transportation of aggregate by barge within the scope of the federal assessment.
Migratory Birds Convention Act (1994)	*Migratory Birds Regulations*	Based on desktop review and observations, migratory birds may inhabit the Proposed Project Area. Best practices to avoid disturbing active nest sites will be applied.
Species at Risk Act (2002)	*Permits Authorizing an Activity Affecting Listed Wildlife Species Regulations* (2013)	Initial review by DFO concluded that the Proposed Project may result in risks to resident killer whales, a SARA listed species. Best practices to avoid disturbing species at risk will be applied throughout the Proposed Project.
Transportation of Dangerous Goods Act (1992)	*Transportation of Dangerous Goods Regulations*	This Act addresses the classification, documentation, marking, means of containment, required training, emergency response, accidental release, protective measures and permits required for the transportation of dangerous goods by road, rail, marine, or air.

Act	Regulation (include but not limited to)	Trigger
Navigation Protection Act (1985) *Navigation Protection Act* (amended 2014)	*Navigable Waters Works Regulations*	Approval of the construction of works in waterways that might otherwise violate the common law right of navigation (e.g., marine loading facilities).
Canadian Shipping Act (2001)	*Pollutant Discharge Reporting Regulations* *Small Vessel Regulations* *Ballast Water Control and Management Regulations* (2011) *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* *Vessel Clearance Regulations* *Vessel Operation Restriction Regulations* *Cargo, Fumigation and Tackle Regulations*	The Act and regulations concern marine navigation, marine search and rescue, pleasure craft safety, marine ship-source pollution prevention and response, barge loader design standards, as well as support to other federal departments and agencies. The federal Minister of Transport has authority under the Act, along with limited responsibility by the Minister of DFO for navigation services and oil spill response (ships or facilities near the ocean).
Marine Liability Act (2010)	-	Makes owner and/or operators of vessels liable for the vessel and consequences of its operation.

3.1.4 Issues Tracking

Issues tracking tables that describe issues and concerns raised and the degree to which they have been considered or addressed are provided for each of the following groups:

- Technical Working Group, including local, provincial and federal agencies and First Nations (Volume 4, Part G – Section 22.0: Appendix 2-A);
- Aboriginal Groups (Volume 4, Part G – Section 22.0: Appendix 2-B; see also Section 3.2); and
- Public (Volume 4, Part G – Section 22.0: Appendix 2-C; see also Section 3.3).

3.2 Aboriginal Information Distribution and Consultation

The Section 11 Order for the Proposed Project specifies, in Part D – Assessment Procedures – Pre-Application Stage, that BURNCO will undertake the following activities during the pre-application stage:

10.1 For the purposes of developing the Application, the Proponent must consult with First Nations with respect to their perspectives and opinions about the Proposed Project, and the potential effects of the Proposed Project on their Aboriginal interests.

10.2 The Proponent must seek advice from First Nations on appropriate means of consultation.

In accordance with the above provisions of the Section 11 Order relating to First Nations consultation for the pre-application stage, the remainder of this report describes BURNCO's information distribution and consultation activities by the Proponent in relation to the Proposed Project prior to submitting the EAC Application.

This report does not cover BC EAO- or CEA Agency-led engagement activities with Aboriginal Groups. The *Skwxwú7mesh* Nation and the Tsleil-Waututh Nation participated in the BC EAO-established Working Group for the Proposed Project.

3.2.1 Identified Aboriginal Groups

As set out in the Section 11 Order issued by the BC EAO on June 1, 2010, the following Aboriginal groups were identified as potentially affected by Proposed Project and requiring consultation:

- Squamish (S*kwxwú7mesh*) Nation; and
- Tsleil-Waututh Nation.

In December 2011, the CEA Agency identified the following Aboriginal groups as having a potential interest in the Proposed Project:

- Chemainus Tribes;
- Cowichan Tribes;
- Halalt First Nation;
- Katzie First Nation;
- Kwantlen First Nation;
- Kwikwetlem First Nation;
- Lake Cowichan First Nation;
- Lyackson First Nation;
- Métis Nation British Columbia;
- Musqueum Nation;
- Penelakut First Nation;
- S*kwxwú7mesh* Nation;
- Semiahmoo First Nation;
- Sto:Lo Xwexwilmexw Treaty Asscociation;
- Stz'uminus First Nation;

- Tsawassen First Nation; and
- Tsleil-Waututh Nation.

On November 12, 2013, the CEA Agency defined the scope of marine shipping for the purposes of the comprehensive study to include barge traffic in Howe Sound, Ramillies Channel, Thornbrough Channel, and Queen Charlotte Channel (south of Passage Island). The scope no longer included shipping from where the barges meet the existing shipping lanes in the Strait of Georgia and in the Fraser River to BURNCO facilitates in Burnaby and Langley. As a result, the CEA Agency was of the view that the Proposed Project no longer overlaps with the asserted traditional territories of the Chemanus Tribes, Katzie First Nation, Kwantlen First Nation, Kwikwetlem First Nation, Semiahmoo First Nation, the Sto:Lo Xwexwilmexw Treaty Asscociation, and Tsawassen First Nation. In a letter dated November 12, 2013, the CEA Agency subsequently identified information requirements to be included in the EAC Application/EIS for the following Aboriginal groups:

- Cowichan Tribes;
- Halalt First Nation;
- Lake Cowichan First Nation;
- Lyackson First Nation;
- Métis Nation British Columbia;
- Musqueam Indian Band;
- Penelakut Tribe;
- S*kwxwú7mesh* Nation;
- Stz'uminus First Nation; and
- Tsleil-Waututh Nation.

On December 5, 2013, the BC EAO amended their earlier Section 11 Procedural Order (issued June 1, 2010) and included the barging routes in the scope of the Proposed Project. First Nations, for the purpose of the Section 11 Order, remained defined as the Skwxwú7mesh Nation and the Tsleil-Waututh Nation. The Section 11 Order was also amended to specify First Nations consultation activities to be undertaken by the BC EAO in relation to potential effects on Aboriginal Interests arising from the marine barging routes.

The following sections provide summaries of consultation activities, information discussed, comments received, and concerns and interests raised during those activities with the following Aboriginal Groups:

- Cowichan Tribes;
- Halalt First Nation;
- Lake Cowichan First Nation;

- Lyackson First Nation;
- Métis Nation British Columbia;
- Musqueam Indian Band;
- Penelakut Tribe;
- S*kwxwú7mesh* (Squamish) Nation;
- Stz'uminus First Nation; and
- Tsleil-Waututh Nation.

A tracking of key issues identified by Aboriginal groups identified above, and provide the Proponent's responses to these issues, is provided in Volume 4, Part G – Section 22.0: Appendix 2-B as well as Appendix 13-A.

3.2.2 Pre-Application

3.2.2.1 Skwxwú7mesh Nation

The following summary of consultation activities between *Skwxwú7mesh* Nation was written with input from *Skwxwú7mesh* Nation. The *Skwxwú7mesh* Nation is the Aboriginal group primarily affected by the Proposed Project. Certain duties of consultation (and accommodation) were delegated by the Crown to the Proponent under the BC EAO's section 11 and 13 orders. In discussions with the Proponent, *Skwxwú7mesh* Nation has stated that it was not consulted by the Crown respecting the delegation of these duties by the Crown to the Proponent, and *Skwxwú7mesh* has not agreed this delegation is appropriate. *Skwxwú7mesh* has noted to the Proponent significant concerns regarding the effectiveness of the environmental assessment process undertaken by the Crown, particularly respecting the assessment of project impacts on *Skwxwú7mesh* Nation Aboriginal Rights (including Aboriginal Title) and the utilization of the process by the Crown to discharge legal obligations of consultation and accommodation.

- *Skwxwú7mesh* Nation technical representatives have participated, to the extent deemed necessary by *Skwxwú7mesh*, in the Crown EA process. Technical representatives have attended Working Group meetings, reviewed documents and assisted *Skwxwú7mesh* in the preparation of comments on documents (e.g., draft AIR/EIS Guidelines), and participated in discussions with Crown agencies concerning the Proposed Project and its potential effects. Numerous concerns regarding the Proposed Project's potential to affect *Skwxwú7mesh* Nation Aboriginal Rights have been raised by *Skwxwú7mesh* throughout the pre-Application phase, including but not limited to, effects on: freshwater and marine resources and habitat, particularly salmon and eulachon; water quality and quantity in, and the integrity of, McNab Creek; *Skwxwú7mesh* members' access to and through, and use of the site, and adjacent areas, for various traditional harvesting purposes; elk and elk habitat; the nature of *Skwxwú7mesh* members' traditional practices in the area; *Skwxwú7mesh* governance over the area; and impacts on the Nation's traditional village site *Kn'ech'tenm*.
- *Skwxwú7mesh* representatives and technical representatives have also participated in confidential discussions regarding the potential for effects on *Skwxwú7mesh* as a result of the Proposed Project, among

other things, with the Proponent. The outcome of these discussions is reflected in the discussion of potential effects on *Skwxwú7mesh*, and the mitigation, avoidance, offsetting and/or accommodation otherwise of these effects in other sections of this Part C of the Application. An important outcome of these discussions are conditions for the Proposed Project; *Skwxwú7mesh* and the Proponent have agreed to these conditions for the Proposed Project and have agreed to ongoing discussions to ensure these conditions are met.

- Representatives of the *Skwxwú7mesh* have participated in pre-Application activities as set out above. *Skwxwú7mesh* has also had the opportunity to review and comment on this consultation report and its views have been incorporated. The Nation will also participate in the Application review and subsequent phases of the Crown EA process.
- A confidential Occupation and Use Study (OUS) was undertaken by *Skwxwú7mesh* to inform its participation in discussions with the Proponent and in the Crown EA process. The OUS collected and articulated information regarding *Skwxwú7mesh* rights and interests in the areas with the potential to be affected by the Proposed Project; some of this information is set out in other sections of this Part C of the Application. This information has informed the assessment of effects from the Proposed Project on *Skwxwú7mesh* rights and interests as described above in Part C of the Application and the identification of measures to mitigate, avoid, offset and/or otherwise accommodate these effects, particularly those conditions agreed to by *Skwxwú7mesh* and the Proponent.
- In *Skwxwú7mesh*'s view, the Crown's legal duties for meaningful consultation on, and the accommodation as necessary of, *Skwxwú7mesh*'s Aboriginal Rights have not been fully addressed yet and will be ongoing throughout the Crown EA process.

3.2.2.2 Tsleil-Waututh Nation

The following summary of consultation activities between Tsleil-Waututh Nation was written by the Proponent and reviewed by Tsleil-Waututh Nation. Following their review, Tsleil- Waututh Nation provided clarification that they do not consider the following activities or communications to be part of the consultation process (inclusive of information sharing):

- Communications unrelated to the Project;
- Interactions with Tsleil-Waututh members or staff not identified as part of Tsleil-Waututh's consultation team;
- Interactions with Tsleil-Waututh field crews; and
- Any involvement with Tsleil-Waututh-owned businesses, such as Inlailwatash.

From February to March 2010, the Proponent attempted to initiate discussions with the Tsleil-Waututh Nation Band Office through email and telephone communications. These communications were followed by the issuance of a letter of introduction from the Proponent to the Chief and Council via email and letter mail. The Proponent enclosed the Project Description with the letter and informed Tsleil-Waututh Nation that the Project Description had been submitted to initiate review under the *British Columbia Environmental Assessment Act* (BCEAA) and the *Canadian Environmental Assessment Act* (CEAA). The Proponent then offered to meet with Tsleil-Waututh Nation

to provide more Proposed Project information and to discuss how Tsleil-Waututh Nation would like to participate in the environmental review process.

Having received no response from the Tsleil-Waututh Nation, the Proponent telephoned the Tsleil-Waututh Nation Treaty, Land and Resources Department in April 2010 to discuss the Project Description and request a meeting. The Proponent followed up by providing another copy of the Project Description via email and hand-delivery to the Tsleil-Waututh Nation Band Office later that month.

In June 2010, the Proponent telephoned Tsleil-Waututh Nation's Stewardship Coordinator to discuss the archaeological impact assessment (AIA) for the Proposed Project and to notify Tsleil-Waututh Nation of the issuance of the Proposed Project's *Heritage Conservation Act* permit, a copy of which was provided via email.

The Proponent then sent a letter to Chief and Council in June 2012 to update Tsleil-Waututh Nation on the status of the Proposed Project and next steps. The latest iteration of the Project Description was included. The Proponent also advised Tsleil-Waututh Nation that the Proposed Project was subject to review both under the BCEAA and the CEAA and stated that work had commenced on the draft AIR/EIS Guidelines for the Application and that the Application was to be submitted to the EAO and CEAA later in 2012. The Proponent requested a meeting with Tsleil-Waututh Nation to provide additional Project information, to discuss Tsleil-Waututh Nation's preferred protocols for communication and consultation on the Proposed Project and to discuss potential opportunities for wider Tsleil-Waututh Nation participation in the Proposed Project.

In March 2013, the EAO contacted Tsleil-Waututh Nation requesting comments on the draft AIR/EIS Guidelines for the Proposed Project. Tsleil-Waututh Nation responded in May 2013 requesting the requirement for information on heritage sites, wash water, surface water, ground water, waste water, and environmentally sensitive areas be included in the AIR/EIS Guidelines. The Proponent provided proposed responses to Tsleil-Waututh Nation's comments on the draft AIR/EIS Guidelines in a tracking table via email in July 2013. In the email, the Proponent stated it was providing the comments to Tsleil-Waututh Nation for review in advance of submitting them to EAO and CEAA, requesting a response from Tsleil-Waututh Nation in early August. The Proponent also provided a brief explanation of the Proposed Project's next steps in the EA process and offered to meet separately with the Tsleil-Waututh community during the upcoming 30-day public comment period to discuss the Proposed Project. The "BURNCO Aggregate Project - Draft AIR Comment Tracking Table" attached to the July 29, 2013 email outlined how the Proponent considered and incorporated Tsleil-Waututh Nation's feedback into the revised draft AIR/ EIS Guidelines. Tsleil-Waututh Nation's questions and concerns, as presented in the tracking table could be categorized under four key themes:

- Definition of environmentally sensitive areas;
- Interest in the identification of heritage sites within the Proposed Project Area and its vicinity as well as related baseline studies, potential impacts and mitigation strategies;
- Surface water and groundwater resources; and
- Wastewater treatment and disposal.

Where applicable, the Proponent revised the draft AIR/EIS Guidelines to address Tsleil-Waututh Nation concerns. In cases where adjustments to the draft AIR/EIS Guidelines were not made in response to Tsleil-Waututh Nation concerns, the Proponent provided an explanation of how the concern was already being addressed, such as elsewhere within the AIR/EIS Guidelines.

Tsleil-Waututh Nation confirmed receipt of the Proponent's proposed responses to Tsleil-Waututh Nation's comments on the draft AIR/EIS Guidelines, stating they had no further comments and indicating they would appreciate staying updated on the Proposed Project in August 2013. In September 2013, the Proponent responded to Tsleil-Waututh Nation with an update on the Proposed Project, notifying Tsleil-Waututh Nation of the upcoming 30-day public comment period on the draft AIR/EIS Guidelines document (September 19, 2013 to October 19, 2013) and the two public open houses scheduled to take place during this period (October 1, 2013 and October 2, 2013). A public notice advertising the comment period and public open houses was attached for reference. The Proponent reiterated the offer to have a separate meeting with Tsleil-Waututh Nation to discuss the draft AIR/EIS Guidelines during the public comment period.

In correspondence addressed to the BC EAO and the Proponent regarding the Proposed Project, Tsleil-Waututh Nation requested that shipping routes in the Strait of Georgia and Fraser River and all the estuaries in the region be included in the scope of the assessment. The Proponent provided in its analysis of incremental changes to existing barge traffic within the waters of Tsleil-Waututh Nation's consultation area as a result of the Proposed Project, which confirmed the exclusion of the Strait of Georgia and Fraser River from the effects assessment.

In January 2014, the Proponent sent a letter to follow up on the parties' communications in August 2013 and to provide another update on the Proposed Project. The Proponent reported that comments received during the public comment period in fall 2013 resulted in an update to the draft AIR/EIS Guidelines, and that an updated version was in progress. The Proponent also noted that the Aboriginal Information Requirements (Part C) was not being updated and that compilation of background information regarding Tsleil-Waututh Nation, based on publicly available information, had commenced. The Proponent attached the draft summary of Tsleil-Waututh Nation background information to the letter and asked that Tsleil-Waututh Nation review the information and provide comments. The letter also requested Tsleil-Waututh Nation to provide comments on potential effects of the Proposed Project on Tsleil-Waututh Nation interests and what measures the Proponent should consider to avoid, limit or otherwise mitigate effects associated with the Proposed Project. Noting that Tsleil-Waututh Nation had expressed interests in the marine shipping route, the Proponent included in the letter the analysis of incremental changes to existing barge traffic within the waters of Tsleil-Waututh Nation's consultation area as a result of the Proposed Project.

The Proponent emailed Tsleil-Waututh Nation in late March 2014 requesting a meeting to discuss Tsleil-Waututh Nation's questions and concerns with the final draft of the AIR/EIS Guidelines for the Proposed Project.

In April 2014, Tsleil-Waututh Nation provided comments on the draft AIR/EIS Guidelines directly to BC EAO highlighting Tsleil-Waututh Nation's goal to expand their participation in the planning and development processes that take place within their Consultation Area as part of their stewardship of land and resources. Tsleil-Waututh Nation requested clarification on BC EAO's changes to wording around review of the AIR/EIS Guidelines and the cumulative effects assessment. Wording changes were requested regarding fish habitat, marine resources and consultation and a definition of the term country foods was requested. Tsleil-Waututh Nation requested the scope of the Proposed Project include Strait of Georgia and the Fraser River shipping routes and all estuaries within the

region be included in the LSA/RSA. Tsleil-Waututh Nation also requested copies of maps showing the VC Local and Regional Study Area boundaries for the Proposed Project.

Tsleil-Waututh Nation provided the Proponent with a letter on June 19, 2014 commenting on the background information for the Aboriginal Information Requirements (Part C) of the AIR/ EIS Guidelines. Tsleil-Waututh Nation requested that the Tsleil-Waututh Nation Statement of Intent Map not be used to identify the Tsleil-Waututh Nation territory requesting the Tsleil-Waututh Nation Consultation Area be used instead. Tsleil-Waututh Nation requested additional foods be added to the list of foods harvested, provided additional DFO management subareas where Tsleil-Waututh Nation Food, Social, Ceremonial fisheries take place, and requested wording changes regarding traditional foods and activities.

In August 2014, the Proponent provided a letter to Tsleil-Waututh Nation indicating refinements to the design of the Proposed Project had occurred since the design was presented at the Public Open Houses. A letter was attached describing the changes to the design and the key revisions to the AIR/EIS Guidelines in response to comments received from Aboriginal groups, the Technical Working Group, and the public. The Proponent confirmed that the design refinements do not affect the scope of the Proposed Project for the purpose of the environmental assessment, but modelling for the air quality, noise, and visual quality effects will be re-modelled and re-assessed.

Tsleil-Waututh Nation provided a letter to the BC EAO in September 2014 responding to the memo from the Proponent regarding the refinements to the design of the Proposed Project. The letter reiterated Tsleil-Waututh Nation's goal to expand their participation in the planning and development processes that take place within their Consultation Area as part of their stewardship of land and resources. Tsleil-Waututh Nation identified concern regarding the increase in the size of stockpiles and requested information regarding the percentage of second growth forest that would be fallen in comparison to the 2013 Project design. In addition, Tsleil-Waututh Nation indicated concern that locating the barge load out area closer to the McNab Creek estuary could result in greater potential for impact to estuary. Tsleil-Waututh Nation requested all reports and studies on McNab Creek's fish and fish habitat, marine mammals, intertidal zone, and marine water quality as they become available. Tsleil-Waututh Nation also noted appreciation for the more robust dirt berm (i.e., the Processing Area Dirt Berm) included in the new Proposed Project design.

In October 2014 the Proponent provided an email answering the questions raised by Tsleil-Waututh Nation in their September email to BC EAO regarding the refinements to the Proposed Project's design. The Proponent indicated that the rationale for the increased size of stockpiles was included in the memo provided to Tsleil-Waututh Nation in the August 2014 correspondence. The Proponent confirmed an additional 6.85 acres of second growth forest would be removed compared to the September 2013 conceptual layout. The Proponent also attached the reports and studies on the fish and fish habitat, marine mammals, intertidal zone, and water quality including the following documents:

- Appendix 5.1-A: Fisheries and Freshwater Habitat Baseline;
- Appendix 5.2-A: Marine Biophysical Baseline;
- Appendix 5.2-B: Marine Mammal Baseline;
- Appendix 5.5-A: Surface Water Hydrological Baseline;

- Appendix 5.5-B: Baseline Data Report: McNab Valley Surface Water Quality, 2009 – 2014;
- Appendix 5.6-A: Hydrogeological Characterization (Groundwater Flow); and
- Appendix 5.6-B: Geochemical Evaluation of Groundwater Samples (Groundwater Quality).

The Proponent also confirmed the vegetated dirt berm included in the refined Proposed Project design will be more substantial than previously proposed and will cover 9,083 m^2, compared to 1,348 m^2 in the September 2013 conceptual layout. In addition, the shorter large loading conveyor requires a buffer area of 962 m^2 compare to 3,305 m^2 proposed previously.

In November 2015, the Proponent sent a letter to Tsleil-Waututh Nation thanking them for their input on the preliminary draft description of the background information for the Aboriginal Information Requirements (Part C) of the AIR/ EIS Guidelines and providing them with a copy of the revised summary for their review. The Proponent requested additional information pertaining to Tsleil-Waututh Nation's interests and the suggested measures the Proponent could undertake to avoid, limit, or mitigate effects of the Proposed Project on Tsleil-Waututh interests. The Proponent reiterated their understanding that the Proposed Project Area is not within Tsleil-Waututh Nation's consultation area but Tsleil-Waututh Nation may have interests in the marine shipping route. The Proponent provided Tsleil-Waututh Nation with the expected incremental changes from the Proposed Project to existing barge traffic within Tsleil-Waututh Nation's consultation area and requested input on potential adverse effects on Tsleil-Waututh Nation's Aboriginal rights, title, or other interest.

In January 2016, the Proponent provided Tsleil-Waututh Nation with portions of Part C relevant to Tsleil-Waututh Nation and a previous version of this consultation report for review and comment. In February 2016, Tsleil-Waututh Nation provided comments on both documents that have been incorporated and/or responded to by the Proponent.

3.2.2.3 Other Aboriginal Groups

For the other Aboriginal groups subsequently identified by CEA Agency for inclusion (Musqueam Indian Band, Stz'uminus First Nation, Cowichan Tribes, Halalt First Nation, Lake Cowichan First Nation, Lyackson First Nation, Penelakut Tribe and Métis Nation British Columbia), consultation activities have been limited to providing each Aboriginal group with information to be included in the Application for review and requesting that each Aboriginal group provide information on potential effects on their Aboriginal Rights and concerns related to the Proposed Project. CEA Agency had previously notified each Aboriginal group about the Proposed Project and provide background information.

In January 2016, the Proponent provided each of the above-noted Aboriginal groups with portions of Part C relevant to each Aboriginal group and a previous version of this consultation report for review and comment. Only Cowichan Tribes and Penelakut Tribe responded to the email.

In a letter dated January 21, 2016, Cowichan Tribes provided suggestions for edits to sections of Part C, which have been incorporated by the Proponent.

Penelakut Tribe noted in email correspondence dated January 12 that they do not support the use of information that is in the public domain without their express permission. Penelakut Tribe noted that information could be incorrect or out-of-date. Penelakut also noted in the January 12 email, as well as a follow up email dated January 22, that the Proponent has not engaged in consultation with the Aboriginal group and that the protocol for having Penelakut review documents requires a participation agreement. The Proponent added text to relevant section of Part C stating: "Penelakut Tribe has not reviewed this Part C Aboriginal Information Requirements of the EAC Application/EIS. Penelakut Tribe has not provided information to the Proponent and does not support the use of publicly-available information in the Application to support the assessment."

3.2.3 EAC Application/EIS Review

Upon acceptance of the EAC Application/Environmental Impact Statement (Application) for review by the BC EAO and the CEA Agency, The Proponent will comply with Part E – First Nations Consultation Assessment – Assessment Procedures of the Section 11 Order by making reasonable efforts to undertake the following activities during the Application Review stage, subject to modification ordered by the BC EAO, as necessary. The following activities are proposed for *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation:

- The Proponent will immediately provide copies of the Application, in digital formats and hard copy if required, to Aboriginal groups to facilitate review and comment on the Application, either through the Working Group or independently, as required by the BC EAO and the CEA Agency.
- The Proponent will arrange consultation meetings by mutual agreement with *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation, as necessary, to continue the process of identifying:
  - Any specific asserted Aboriginal Rights and/or Title and interests that may be potentially affected by the Proposed Project, as identified in Part C, or other sources of information; and
  - Measures to avoid or mitigate the potential adverse effects of the Proposed Project and/or to otherwise address or accommodate concerns expressed by *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation.
- The Proponent will seek to develop a decision-making framework for consultation meetings with *Skwxwú7mesh* Nation and Tsleil-Waututh Nation to enable consistent and fair dialogue, while facilitating any minor dispute resolution at preliminary stages of discussions;
- Within the time limits specified by the BC EAO, the Proponent will provide the BC EAO and *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation with a written report on the results of the consultation activities with *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation, identifying:
  - Issues and concerns raised with respect to the Proposed Project's potential adverse effects on asserted Aboriginal Rights and interests and on the potential for adverse environmental, economic, social, health and heritage effects; and
  - How the Proponent intends to address these issues and concerns.
- Based on the above written report, the Proponent will, if required by the BC EAO, implement additional measures for consultation and accommodation of concerns expressed by Aboriginal groups, where appropriate and in consultation with those Aboriginal groups.

- At the request of the BC EAO, the Proponent will provide the BC EAO with any information the BC EAO considers relevant with respect the Province's legal duties of consultation and accommodation.
- The Proponent acknowledges that the provision of information to Aboriginal groups does not constitute consultation on its own accord but is rather one step of the larger consultation process.

For the other Aboriginal groups subsequently identified by the CEA Agency for inclusion (Musqueam Indian Band, Stz'uminus First Nation, Cowichan Tribes, Halalt First Nation, Lake Cowichan First Nation, Lyackson First Nation, Penelakut Tribe and Métis Nation British Columbia), consultation activities will consist of notifications. The following activities are proposed for the Application Review stage, subject to modification ordered by the BC EAO or CEA Agency, as necessary:

- Written (i.e., letter and e-mail) communications with leadership and identified representatives as appropriate to provide updates on the Proposed Project, including achievement of EA-related milestones or changes to the Potential Project.
- Written communications would include an offer to meet with leadership and identified representatives. If the Proponent is requested to host or attend community meetings, the need for such meetings will be explored as early as possible after the request.

Where and when formally requested, the Proponent will respect Aboriginal groups' requests to keep information confidential. Where needed, the Proponent will work with Aboriginal groups to develop suitable terms or agreements to protect confidentiality, while ensuring that the Proponent can fulfill requirements to provide information to regulators for review of the EAC Application/EIS. The Proponent will seek approval, not just review, from the relevant Aboriginal group before sharing information with BC EAO.

The Proponent will demonstrate where they have incorporated feedback of Aboriginal groups during the review of the EAC Application/EIS, and provide a rationale for instances where feedback was not incorporated.

3.2.4 Post-EAC Application/EIS Review

The following key consultation activities are proposed for the Environmental Assessment Certificate (EAC) is issued and during the construction and operations phases. The proposed activities are preliminary and subject to input from BC EAO and CEA Agency and will be informed by conditions related to the EAC or in ancillary agreements with Aboriginal groups.

During the construction period, which is expected to be initiated as soon as possible after the EAC is issued, the Proponent will continue to consult with *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation to identify and resolve any outstanding issues or monitor conditions as required under Environmental Monitoring Plans. The Proponent will also continue to provide updates on construction activities at regular intervals or as needed to keep Aboriginal groups informed.

During operations, the Proponent will continue to consult with *Sḵwx̱wú7mesh* Nation and Tsleil-Waututh Nation and work towards resolution of issues or concerns through the operations phase. Consultation through correspondence and meetings or teleconference to address outstanding issues will continue through operations. The Proponent will also continue to provide updates on the operations activities at regular intervals or as needed to keep Aboriginal groups informed.

Where and when formally requested, the Proponent will respect Aboriginal groups' requests to keep information confidential. Where needed, the Proponent will work with Aboriginal groups to develop suitable terms or agreements to protect confidentiality, while ensuring that the Proponent is able to comply with conditions of the EAC related to provision of information. The Proponent will seek approval, not just review, from the relevant Aboriginal group before sharing information with BC EAO.

The Proponent will demonstrate where they have incorporated feedback of Aboriginal groups within all phases of the Proposed Project, and provide a rationale for instances where feedback was not incorporated.

3.2.5 Confirmation of Review and Comment by Identified Aboriginal Groups

On January 11, 2016, Aboriginal Groups listed in Section 3.2.1 were provided the opportunity to review and comment on a draft of the Pre-Application Consultation Report prior to EAC Application/EIS submission. The draft Pre-Application Consultation Report was provided to the *Sḵwx̱wú7mesh* Nation on January 14, 2016. Comments received by the Proponent by February 1, 2016 are tracked in Volume 4, Part G – Section 22.0: Appendix 2-B and have been incorporated, as appropriate.

3.3 Public and Agency Information Distribution and Consultation

3.3.1 Pre-Application

Public Consultation and Communication activities at this phase focused on project notification and the identification of public issues and concerns to be considered in developing the AIR/EIS Guidelines. The BCEAO provided a 30-day period for public review and comment on the draft AIR/EIS Guidelines. The Proponent tracked and responded to public comments received during that period.

3.3.1.1 Public Notice and Distribution of Information

3.3.1.1.1 General

A key aspect of the Consultation and Communication Program was the timely dissemination of information about the Proposed Project and the EA process. The Program incorporated the following information distribution mechanisms to encourage a wide-range of public involvement:

- An introduction letter was mailed to identify Stakeholder Groups. It included information on the Proposed Project and the EA process and schedule, a summary of public communications and consultation opportunities, and an invitation to communicate directly with BURNCO's Project Manager or designate.

- BURNCO's project website (www.burncohowesound.com) included Proposed Project notifications and updates, and information on where to access key documents developed during the EA process.
- Newspaper advertisements and media releases were posted in local newspapers.
- The BCEAO website will house correspondence from the public to the BCEAO and the BCEAO's response, key documents pertaining to the Proposed Project and the EA, and notices of the availability of the draft AIR/EIS Guidelines and the public comment period.

3.3.1.1.2 Public Comment Period and Open House Notifications

BURNCO arranged for public notification of the BCEAO's formal Public Comment Period on the draft AIR/EIS Guidelines, as well as of BCEAO-hosted Public Open Houses[13]. BURNCO used the following notification mechanisms:

- Letter mail out to identified Stakeholder Groups and interested First Nations;
- Newspaper advertisements in the publications listed in Table 3-8;
- BURNCO's project website (www.burncohowesound.com); and
- The BCEAO website (www.eao.gov.bc.ca) and the BCEAO's electronic Project Information Centre (http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_355.html).

Draft newspaper advertisements were provided to the BCEAO Project Assessment Manager for review, comment and final approval of content, format and publication schedule.

Table 3-8: Pre-Application Publication Schedule: BURNCO Public Open Houses and Public Comment Period

Publication	Date/Rationale
The Local (www.thelocalweekly.ca) (Published weekly (Thursdays) ; Distribution 12,600)	Sept 12 – at least 7 days prior to start of comment period Sept 19 – at least 7 days prior to first Open House
Sunshine Coast Reporter (www.coastreporter.net) (Published weekly (Fridays); Distribution 11,905)	Sept 13 – at least 7 days prior to start of comment period Sept 20 – at least 7 days prior to first Open House
The Chief (www.squamishchief.com) (Published weekly (Thursdays)	Sept 12 – at least 7 days prior to start of comment period Sept 19 – at least 7 days prior to first Open House
The North Shore News (www.nsnews.com) (Published Wed/Fri/Sun; Distribution 63,000)	Sept 11 – at least 7 days prior to start of comment period Sept 22 – at least 7 days prior to first Open House

[13] These sessions were called Public Open Houses during Pre-Application. During the EAC Application/EIS Review, they will be called Public Information Sessions.

3.3.1.2 Consultation Activities

3.3.1.2.1 Meetings

Meetings were held with Stakeholder Groups, as needed, to present the Proposed Project and the scope of assessment, and discuss their concerns and perspectives. These meetings were held in person or by telephone.

- Round Table Meeting with McNab Creek Strata Council, May 22, 2012
- Town Hall Meeting was held for all Islands Trust members, May 23, 2012
- Presentation and Q&A, Squamish Streamkeepers Society, May 24, 2012
- Site Tour and Meeting with the Howe Sound Community Forum, May 25, 2012
- Meeting, MLA Ralph Sultan, July 10, 2012, introduced project and provided project information pieces
- Meeting, MLA Joan McIntyre, July 25, 2012, introduced project and provided project information pieces
- Meeting, MLA Naomi Yamamoto, July 27, 2012 introduced project and provided project information pieces
- Meeting, MLA Nicolas Simons, August 16, 2012 introduced project and provided project information pieces

The Proponent offered and was open to meeting with individuals and Stakeholder Groups, upon requested, throughout the Pre-Application period.

3.3.1.2.2 Public Open Houses

Open Houses were held in Gibsons and near Horseshoe Bay in West Vancouver to provide an opportunity for the public to meet with BURNCO and its consultants to discuss the Proposed Project and obtain feedback on the draft AIR/EIS Guidelines. Open Houses were advertised in local media and Stakeholder Groups received an invitation in the mail. Written comment feedback forms were provided at the Open House. Completed feedback forms were submitted directly to the BCEAO. BURNCO responded to all public issues.

3.3.1.2.2.1 Gibsons

The first Public Open House took place on Tuesday, October 1, 2013 from 4:00 p.m. - 7:30 p.m. at the Cedars Inn, 895 Gibsons Way, Gibsons, BC.

The Public Open House was hosted by the BCEAO which was represented by Gerry Hamblin (Project Assessment Manager) and Yasmeen Qureshi (Project Assessment Officer). In addition, Kevin Inouye and Catherine Ponsford represented the CEA Agency as part of the cooperative EA.

The following BURNCO representatives were in attendance: Derek Holmes (Regional Manager), Kim Titus (Vice President), Darren Kelm (Senior Property Manager), and Melanie Gaboriault (Communications Director).

The following subject matter experts from Golder Associates Ltd. were in attendance to answer questions and provide specific technical information regarding the draft AIR/EIS Guidelines: Alan Calder (EA Process and

general support), Sacha Clark (EA Process and general support), Chris Coles (Surface Water), Mark Milner (Air, Climate, GHG and Noise), Anthony Smith (GIS Analysis and Visual Resources), Robert Harrison (Fisheries and Aquatic Habitat) and Kate Moss (Terrestrial Wildlife).

Sixty-eight individuals signed into the Public Open House using the BCEAO sign-in sheet. Attendees self-identified as being from the following communities: Gibsons (36), Roberts Creek (7), Gambier Island (5), Bowyer Island (3), Sechelt (3), Elphinstone (2) Keats Island (2), Lions Bay (2), Halfmoon Bay (1), Hopkins (1), Langdale (1), McNab (1), and Unknown (4).

3.3.1.2.2.2 West Vancouver

The second Public Open House took place on Wednesday, October 2, 2013 from 5:30 p.m. - 8:30 p.m. at the Gleneagles Community Centre (Gym), 6262 Marine Drive, West Vancouver, BC.

The Public Open House was hosted by the BCEAO which was represented by Gerry Hamblin (Project Assessment Manager) and Yasmeen Qureshi (Project Assessment Officer). In addition, Kevin Inouye and Catherine Ponsford represented the CEA Agency.

The following BURNCO representatives were in attendance: Derek Holmes (Regional Manager), Kim Titus (Vice President), Darren Kelm (Senior Property Manager), Melanie Gaboriault (Communications Director), Mike Powell (President) and Scott Burns (Chief Executive Officer and Chairman of the Board).

The following subject matter experts from Golder Associates Ltd. were in attendance to answer questions and provide specific technical information regarding the draft AIR/EIS Guidelines: Alan Calder (EA Process and general support), Sacha Clark (EA Process and general support), Chris Coles (Surface Water), Mark Milner (Air, Climate, GHG, and Noise), Anthony Smith (GIS Analysis and Visual Resources), Robert Harrison (Fisheries and Aquatic Habitat), Philippe Rouget (Marine Resources), Fred Shrimer (Engineering Geology, Geochemistry), Kate Moss (Terrestrial Wildlife), and Daryl Harrison (Visual Resources).

Two hundred eight individuals signed into the Public Open House using the BCEAO sign-in sheet. Attendees self-identified as being from the following communities: Lions Bay (72), West Vancouver (25), Gambier Island (including Douglas Bay and Brigade Bay) (25), Horseshoe Bay (13), McNab (9), Squamish (5), Brunswick Beach (3), North Vancouver (8), Vancouver (3), Keats Island (2), Bowen Island (1), Bowyer Island (1), Britannia Beach (1), Hopkins (1), Maple Ridge (1), Paisley Island (1), Unknown (14).

3.3.1.2.3 Document and Respond to Formal Public Comments

The 30-day Public Comment Period took place from September 19 to October 19, 2013. The BCEAO received 475 written submissions from organizations and individuals (see Table 3-9).

Table 3-9: Public Comments Received on BURNCO Aggregate Project dAIR/EIS Guidelines

	Number of Submissions	Number of Submitters
Organizations	9	6
Individuals - Personal Info Provided	228	207
Individual Submission - Personal Info Withheld	238	unknown
Total	**475**	**213**

The distribution of individual submissions by location is presented in Table 3-10.

Table 3-10: BURNCO dAIR/EIS Guidelines Public Comments: Distribution of Individual Submissions by Location

Location (Note 1)	No. Submissions from Individuals (Personal Info Provided)	No. Submissions from Individuals (Personal Info Withheld)	Total
Lions Bay	74	82	156
North Vancouver	20	12	32
Vancouver	11	21	32
Gambier Island	10	20	30
West Vancouver	13	14	27
Squamish	14	10	24
Gibsons	11	10	21
Howe Sound	4	8	12
West Howe Sound	1	2	3
Bowyer Island	5	3	8
McNab Creek	3	4	7
Bowen Island	5	2	7
Douglas Bay	1	6	7
Langley	5	2	7
Furry Creek	4	1	5
Burnaby	1	3	4
Halfmoon Bay	3	1	4
Brunswick Beach	2	1	3
Coquitlam	1	2	3
Maple Ridge	1	2	3
New Westminster	2	1	3
Pasley Island	2	1	3
Roberts Creek	3	0	3
Brackendale	1	1	2

Location (Note 1)	No. Submissions from Individuals (Personal Info Provided)	No. Submissions from Individuals (Personal Info Withheld)	Total
Britannia Beach	2	0	2
Chilliwack	1	1	2
Gambier	0	2	2
Gibsons Landing	2	0	2
Kelowna	2	0	2
Port Moody	2	0	2
Richmond	0	2	2
Surrey	2	0	2
Brigade Bay	1	0	1
Campbell River	0	1	1
Coombs	1	0	1
Ekins Point	0	1	1
Five Coves	1	0	1
Hopkins	0	1	1
Hopkins Landing	1	0	1
Horseshoe Bay	1	0	1
Keats Island	1	0	1
Kelvin Grove	1	0	1
Lower Mainland	1	0	1
Lynn Valley	0	1	1
Pitt Meadows	1	0	1
Salmo	0	1	1
Sidney	1	0	1
Whistler	0	1	1
BC Other	0	1	1
Alberta	2	1	3
Ontario	1	3	4
Canada Other	1	0	1
U.S.A.	2	1	3
Other Specified	1	2	3
Location not specified	3	10	13
TOTAL	**228**	**238**	**466**

Notes: 1. Self-identified location of submission author.

Concerns and questions raised during the Public Comment Period (including Open House Feedback Forms) were tracked. Responses were provided to all public issues received during the Pre-application period. Common public issues or themes of issues, and associated standard responses, are presented in Table 3-11.

Table 3-11: Common Themes identified in Pre-Application Public Comments

Issue/Theme	Standard Response
1. Recovery of Howe Sound following past industrial uses	It is acknowledged that historical industrial activities have impacted Howe Sound and that the ecological health of the area has been improving. The current state of Howe Sound will be reflected in the baseline conditions against which potential effects will be assessed. The purpose of the EA is to predict the significance of potential Proposed Project-related effects - environmental, economic, social, heritage and health - and to identify measures to avoid or reduce these potential effects through redesign and operational improvements.
2. Need for a Land Use Plan for Howe Sound	Existing Land and Resource Management Plans and protection or conservation area designations will be considered in assessing potential effects on land and resource uses. As a property owner and stakeholder in the area, BURNCO would participate in a broader planning exercise for Howe Sound. However, EA is not typically a forum for developing new land and resource use planning areas, designations, or objectives.
3. Project benefits	Economic benefits of the Proposed Project, including estimated employment opportunities, will be documented in the EAC Application/EIS.
4. Performance bond	The EAC Application/EIS will include an environmental monitoring and follow-up program to verify the accuracy of the assessment and monitor the effectiveness of proposed measures to avoid or reduce potential effects. The program will be adapted, as needed, to effectively manage environmental effects. The BCEAO will develop a Compliance Management Plan to ensure compliance of conditions of an EA Certificate, if granted. A performance bond or some other form of security is a further compensation option which BURNCO anticipates may be required under the *Mines Act.*
5. Recreational use	An assessment of potential effects on recreation and tourism opportunities will be provided in the EAC Application/EIS.
6. General environmental	An assessment of potential effects on a range of valued environmental components will be provided in the EAC Application/EIS. The purpose of the EA is to predict the significance of potential Proposed Project-related effects and to identify measures to avoid or reduce these potential effects through redesign and operational improvements.
7. Project rationale	The EAC Application/EIS will describe alternatives to the Proposed Project and the rationale for selecting the preferred alternative, with supporting documentation.
8. Visual Resources: General	An assessment of potential effects on visual resources will be provided in the EAC Application/EIS.
9. Fish and aquatic resources: General	An assessment of potential effects on fisheries, freshwater habitat and marine resources will be provided in the EAC Application/EIS.
10. Noise: General	An assessment of potential noise effects will be provided in the EAC Application/EIS.
11. Terrestrial wildlife and vegetation: General	An assessment of potential effects on terrestrial wildlife and vegetation will be provided in the EAC Application/EIS.
12. Air quality: General	An assessment of potential air quality effects will be provided in the EAC Application/EIS.
13. Documentation of agency consultation, including DFO	A Technical Working Group consisting of federal, provincial and local government agencies and First Nations has been established to review the Proposed Project. The EAC Application/EIS will include an issues tracking document that describes issues and concerns raised and the degree to which issues are considered resolved or addressed.
14. Alternatives to the Proposed Project	Alternatives to the Proposed Project will be described in the EAC Application/EIS.

Issue/Theme	Standard Response
15. Cumulative effects	Cumulative effects of the Proposed Project and other certain and reasonably foreseeable projects and activities will be assessed and presented in the EAC Application/EIS.
16. Issues Tracking process	The EAC Application/EIS will include an issues tracking document that describes issues and concerns raised and the degree to which issues are considered resolved or addressed.
17. Accidents and Malfunctions	The EAC Application/EIS will include an assessment of potential accidents, malfunctions and unplanned events and describe how each event would be managed or mitigated.
18. Concern for Howe Sound: General	BURNCO understands your concerns for Howe Sound and is a proud steward of the Proposed Project site and surrounding area, including Howe Sound. The purpose of the EA is to predict the significance of potential Proposed Project-related effects - environmental, economic, social, heritage and health - and to identify measures to avoid or reduce these potential effects through redesign and operational improvements.
19. Monitoring: who will be responsible?	The EAC Application/EIS will include an environmental monitoring and follow-up program to verify the accuracy of the assessment and monitoring the effectiveness of proposed measures implemented to avoid or reduce potential effects during Proposed Project construction, operation, reclamation and closure. The EAC Application/EIS will contain a preliminary Reclamation and Closure Plan that will describe BURNCO's proposed measures and commitments to remove surface facilities, reclaim areas and develop a functional ecosystem in the freshwater pit. The Proposed Project will be regulated under the *Mines Act.* The BCEAO will develop a Compliance Management Plan to ensure compliance of conditions of an EA Certificate, if granted.
20. Assessment methods	The Assessment Methodology will reflect current accepted EA practice in BC and Canada in accordance with the BCEAO Guideline for the Selection of Valued Components and Assessment of Potential Effects (BCEAO 2013). The EAC Application/EIS will provide a clear description of the methods used to conduct the assessment, as follows: - the selection of Valued Component (VCs), including supporting rationale; - the establishment of assessment boundaries; - the description of existing baseline conditions; - the description of potential effects; - the identification of measures to mitigate potential adverse effects; - the evaluation of the potential adverse residual effects; and - the assessment of cumulative effects, as required.
21. Health effects from potential air quality impacts	An assessment of health effects associated with potential air quality impacts will be provided in the EAC Application/EIS.
22. Potential effects on glass sponge reefs.	An assessment of potential effects on marine resources will be provided in the EAC Application/EIS. Marine benthic communities (flora and fauna), which include sponges and other filter feeders, are a Valued Component being considered as part of the assessment. The assessment of marine resources has included dives and towed videos along the Proposed Project Area foreshore and subtidal nearshore. No glass sponge colonies have been observed or are known to occur in the McNab estuary or surrounding foreshore area. Glass sponge reefs have been documented to occur around Passage Island, between Whitecliff and Lighthouse Parks at depths greater than 50 m.

Issue/Theme	Standard Response
23. Hours of operation; plans for expansion	Details of the operation will be covered in the EAC Application/EIS. No operations beyond those described in the EAC Application/EIS are contemplated. The EAC Application/EIS will include an environmental monitoring and follow-up program to verify the accuracy of the assessment and monitor the effectiveness of proposed measures to avoid or reduce potential effects. The program will be adapted, as needed, to effectively manage environmental effects. It is a typical condition of any EA Certificate that the Proposed Project must be operated as proposed in the EAC Application/EIS. The BCEAO will develop a Compliance Management Plan to ensure compliance of conditions of an EA Certificate, if granted. The Proposed Project would also be required to meet operational conditions of a *Mines Act* permit issued by the Ministry of Energy and Mines.
24. BCEAO Process general	Environmental assessment in BC provides an integrated process for identifying and evaluating potential adverse environmental, economic, social, heritage and health effects that may occur during the life of a reviewable project. The assessment process ultimately results in a decision by the responsible ministers regarding whether to issue an EA Certificate, subject to legally binding conditions, which is required before a reviewable project can proceed. The full details of *how* a reviewable project may be undertaken are addressed through the permitting process. See also the EAO and CEAA Joint Response to Public Comments regarding the EA Process for the proposed BURNCO Aggregate Project.

The Public Issues Tracking document was submitted with the Final AIR/EIS Guidelines and made publicly available through the BCEAO's electronic Project Information Centre (e-PIC).

Comments on the draft AIR/EIS Guidelines were considered and revisions made to the AIR/EIS Guidelines made in response, where appropriate. The influence of the consultation process on the development of the AIR/EIS Guidelines was documented in the Public Issue Tracking Table which will be included in the EAC Application/EIS.

3.3.1.3 Consultation and Communications Materials

The following materials were used to support consultation and communications activities during Pre-Application.

- Project introduction and notification letter;
- BURNCO website materials;
- Public notice of Public Comment Period and Open House advertisements (i.e., advertisements in local print media);
- Open House storyboards and maps and presentation materials;
- Draft AIR/EIS Guidelines; and
- Public issues tracking and response documentation.

3.3.2 EAC Application/EIS Review

During the Application/EIS Review phase, the focus is on the content of the Application/EIS, the significance of potential adverse effects, and the adequacy of proposed measures for avoiding or reducing impacts. Once the EAC Application/EIS is accepted for review, it is anticipated that the BCEAO will provide a 45-day period for public review and comment. BURNCO proposes to again track and respond to public comments received during that period. The format of the EAC Application/EIS Review Issues Tracking document will be similar to that used to track public issues and Proponent responses during Pre-Application. Standard responses to the key issue themes identified in Pre-Application public comments (Table 3-11) will be developed and incorporated into the tracking table, as appropriate. These themes will also be used to guide the development of Public Information Session poster boards and other consultation materials.

Below are the Proponent's proposed consultation and communications activities for this phase of the EA review, subject to review and approval by BCEAO and the CEA Agency.

3.3.2.1 Public Notice and Distribution of Information

3.3.2.1.1 General

The Consultation and Communications Program will incorporate several information distribution mechanisms to encourage a wide-range of public involvement during the EAC Application/EIS Review phase. These include the following:

- A letter will be mailed to identified Stakeholder Groups listed in Section 3.2.1 to notify them of the availability of the EAC Application/EIS and the Public Comment Period timeline;
- BURNCO's project website (www.burncohowesound.com) will include Proposed Project updates and a link to the EAC Application/EIS;
- Copies of the EAC Application/EIS will be available for viewing at the following local Public Libraries:
  - Gibsons and District Public Library, Gibsons, BC
  - Bowen Island Public Library, Bowen Island, BC
  - West Vancouver Memorial Library, West Vancouver, BC
  - Squamish Public Library, Squamish, BC
  - Sechelt Public Library, Sechelt, BC
- Newspaper advertisements and media releases will be posted in the publications listed in Table 3-12.

Table 3-12: EAC Application/EIS Review Publication Schedule: BURNCO Public Information Sessions and Public Comment Period

Publication	Date/Rationale
The Local (www.thelocalweekly.ca) (Published weekly (Thursdays) ; Distribution 12,600)	TBD – at least 7 days prior to start of comment period TBD – at least 7 days prior to first Public Information Session
Sunshine Coast Reporter (www.coastreporter.net) (Published weekly (Fridays); Distribution 11,905)	TBD – at least 7 days prior to start of comment period TBD – at least 7 days prior to first Public Information Session
The Chief (www.squamishchief.com) (Published weekly (Thursdays)	TBD – at least 7 days prior to start of comment period TBD – at least 7 days prior to first Public Information Session
The North Shore News (www.nsnews.com) (Published Wed/Fri/Sun; Distribution 63,000)	TBD – at least 7 days prior to start of comment period TBD – at least 7 days prior to first Public Information Session
Bowen Island Undercurrent (www.bowenislandundercurrent.com) (Published weekly; Distribution: Bowen Island)	TBD – at least 7 days prior to start of comment period TBD – at least 7 days prior to first Public Information Session

- The BCEAO's ePIC website will house correspondence from the public to the BCEAO, key documents pertaining to the Proposed Project and the EA, and notices of the availability of the EAC Application/EIS and the public comment period.

3.3.2.1.2 Public Comment Period and Public Information Sessions

BURNCO will be required to arrange for public notification of the BCEAO's formal Public Comment Period on the Application/EIS, as well as of a BCEAO/CEAA-hosted Public Information Session. BURNCO anticipates using the following notification mechanisms:

- Letter mail out to all identified Stakeholder Groups;
- Public Information Sessions to be held in the following locations: Gibsons and West Vancouver;
- Plain language EA summary document to be printed and made available as a handout to Public Information Session attendees, also to be posted to BURNCO project website;
- Key Issues Q&A document to be printed and made available as a handout to Public Information Session Attendees, also to be posted to BURNCO project website;
- EAC Application/EIS; available to view at Public Information Session and at local public libraries: Gibsons, Bowen Island, West Vancouver, Squamish and Sechelt;
- Advertisements in the local newspapers as described in Table 3-12;
- BURNCO's project website (www.burncohowesound.com);
- The BCEAO website (www.eao.gov.bc.ca) and the BCEAO's electronic Project Information Centre (http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_355.html); and
- The CEA Registry (www.ceaa.gc.ca/050/details-eng.cfm?evaluation=54754).

Draft newspaper advertisements will be provided to the BCEAO and to CEAA for review, comment and final approval of content, format and publication schedule.

3.3.2.2 Consultation Activities

3.3.2.2.1 Meetings

Meetings will be held with Stakeholder Groups, as needed, to present the Application/EIS and to discuss the degree to which their issues have been taken into account, are resolved, and/or addressed.

An attempt will also be made to meet with the stakeholders in the closest proximity to the Proposed Project (i.e., Strata Council) as has been done in the past to afford them the opportunity to speak more directly to the Proposed Project Team as per their specific interests in the Proposed Project.

The Squamish Streamkeepers will also be engaged in an effort to present to them specifically the revised offset habitat option.

3.3.2.2.2 Public Information Sessions

Two Public Information Sessions will be held to provide an opportunity for the public to meet with BURNCO and its consultants to discuss the Proposed Project and obtain feedback on the Application/EIS. Public Information Session will be held in Gibsons and in West Vancouver (near Horseshoe Bay).

The Public Information Session will be advertised in the local media. Identified Stakeholder Groups will receive an invitation in the mail. The seasonal BC Ferry schedule will be considered in determining the start and end time of the Public Information Session to provide residents of Gambier and Bowen Islands an opportunity to attend at least one of the sessions. If needed, the Proponent will make arrangements for a scheduled water taxi service so that transportation to/from Gambier and Bowen Islands is not a barrier to participation.

The Proponent will submit a Public Information Session Plan and presentation materials to BCEAO and the CEA Agency review and comment. The Public Information Session format will generally be as presented below.

3.3.2.2.2.1 Format

At the entry to the Public Information Session will be signage and a host welcoming attendees and encouraging them to sign in.

Display booths will be set up to address the key issues of concern, including common public issues identified in Table 3-11.

At each booth will be:

- A Proposed Project Team representative/subject matter expert who was involved in the component study and can answer questions. The strategy should be to listen first - ask that attendee what their concerns are in order to most efficiently address their concerns.
- Take away information sheets specific to that issue.
- Display boards communicating the information from the studies in a simple to understand format.

The first booth will be a Proposed Project Overview booth where there will be a screen that cycles through a Powerpoint presentation about the Proposed Project.

The last booth in the horseshoe shaped display (size of room permitting) will be an About BURNCO booth where we will have the video produced specific to the Proposed Project.

Where possible, a video representation of equipment being proposed for Proposed Project will be shown to give attendees an idea of noise, visuals, etc.

A computer will be available to enable participants to submit written comments online directly to the BCEAO. Written comment forms will be available. Completed comment forms are to be submitted directly to the BCEAO.

BURNCO Project Team members will be in attendance to represent the company and its experience. This team may include Scott Burns (Chairman, BURNCO Rock Products Ltd.), Mike Powell (President, BURNCO Rock Products Ltd.), Darren Kelm (Senior Property Manager, BURNCO Rock Products Ltd.), and Derek Holmes (Property Manager, B.C., BURNCO Rock Products Ltd.).

3.3.2.2.3 Document and Respond to Formal Public Comments

Concerns and questions raised during the Public Comment Period will be tracked using an Issue Tracking Spreadsheet. Comments received from the public along with BURNCO responses will be summarized in a Final Public Consultation and Communications Report.

Responses to the key public issues or themes of issues documented during Pre-Application are presented in Table 3-13.

Table 3-13: Application Review Responses to Common Themes of Public Issues and Concerns

Issue/Theme	Response
1. Recovery of Howe Sound following past industrial uses	It is acknowledged that historical industrial activities have impacted Howe Sound and that the ecological health of the area has been improving. The current state of Howe Sound is reflected in the baseline conditions against which potential effects were assessed. Baseline/existing conditions environment are summarized within each technical section of the EAC Application/EIS (5.2 through 9.2). Baseline reports are provided in Volume 4, Part G – Section 22.0 of the EAC Application/EIS.
2. Need for a Land Use Plan for Howe Sound	Existing Land and Resource Management Plans and protection or conservation area designations were considered in assessing potential effects on land and resource uses. These are summarized in the following technical sections as follows:

Issue/Theme	Response
	▪ Land and Resource Management Plans: Volume 2, Part B – Section 7.3.4.2. ▪ Protection and conservation designations for Terrestrial Wildlife: Volume 2, Part B – Section 5.3.1.4. ▪ Protection and conservation designations for Terrestrial Vegetation: Volume 2, Part B – Section 5.3.2.4. ▪ Protection and conservation designations for Marine Resources: Volume 2, Part B – Section 5.2.4. As a property owner and stakeholder in the area, BURNCO would be pleased to participate in a broader planning exercise for Howe Sound. EA is not typically a forum for developing new land and resource use planning areas, designations, or objectives.
3. Project benefits	Details regarding Proposed Project benefits are provided in Volume 1, Part A – Section 2.10 of the EAC Application/EIS. Benefits of the Proposed Project include: ▪ capital expenditures ($21.5 million), ▪ operational expenditures ($13 million/year), ▪ direct, indirect and induced employment, and ▪ taxation revenue. BURNCO will enhance local economic benefits by implementing policies and practices to support local hiring and procurement when possible. Other benefits or positive effects of the Proposed Project are: ▪ Increased baseflows, wetted area and average flow depth in McNab Creek and several of the other watercourses; ▪ Increased wetted are in the lower segment of WC2 through the construction of a new 770m groundwater-fed channel; ▪ New amphibian breeding habitat ; ▪ Improved aesthetic qualities of the Property after closure would likely have a positive effect on nearby property use and value, and positive social and recreational effects.
4. Performance bond	Details regarding the proposed Environmental management and monitoring programmes for the Proposed Project are provided in Volume 3, Part E – Section 16 and 17 of the EAC Application/EIS. Environment monitoring plans will be developed by qualified environmental professionals and implemented to achieve compliance with Certificate conditions and with terms and conditions of regulatory permits and approvals. Monitoring will consist of two main components: compliance monitoring and effects monitoring. BURNCO commits to providing the funding for these monitoring initiatives. *Mines Act* permitting is required which include provisions for a performance bond.
5. Recreational use	A detailed assessment of potential recreation and tourism effects of the Proposed Project is presented in Volume 2, Part B – Section 7.3 of the EAC Application/EIS. Measures proposed to address key nuisance concerns (noise, air quality, visual quality) also mitigate potential effects on the quality of the environmental setting. Recreation and tourism activities are not expected to be displaced and potential residual effects will be limited to the life of the Proposed Project and were determined to be negligible or not significant.
6. General environmental	Potential effects of the Proposed Project have been assessed for selected valued environmental components to address key issues related to fish and fish habitat, marine

Issue/Theme	Response
	resources, terrestrial wildlife and vegetation, geotechnical and natural hazards, water resources, air quality and climate change. The assessment concludes that, with the application of deign considerations and identified mitigation, no significant adverse environmental effects will result from the Proposed Project. A detailed assessment of potential environmental effects of the Proposed Project is presented in Volume 2, Part B of the EAC Application/EIS.
7. Project rationale	The Proposed Project will provide sand and gravel that will be used to meet the growing demands of the BC marketplace. Alternatives to the Proposed Project and the rationale for selecting the preferred alternative are provided in Volume 1, Part A – Section 2.8 of the EAC Application/EIS. Also included are alternative means of carrying out the Proposed Project (e.g., alternative locations, transportation, mine layout, processing, loading and barging layouts, and mining methods). Criteria considered in the alternative assessment are environmental effects, social effects, cost effectiveness, and technical applicability.
8. Visual Resources: General	A detailed assessment of potential visual effects of the Proposed Project is presented in Volume 2, Part B – Section 7.4 of the EAC Application/EIS. The Proposed Project is predicted to present a relatively small level of visual change to the landscape with effects diminishing with increasing viewing distance. Residents of McNab Creek Strata and recreational marine users in Thornbrough Channel are likely to be most affected. Following the application of proposed mitigation (e.g., layout, screening, revegetation, suitable lighting), potential effects are not predicted to demonstrate an evident contrast with the current landscape character or to produce a noticeable decline in the current level of visual quality. There is a potential to contribute to an increase in scenic character post closure. Potential residual effects were determined to be not significant.
9. Fish and aquatic resources: General	A detailed assessment of potential fisheries, freshwater habitat and marine resource effects of the Proposed Project is presented in Volume 2, Part B – Sections 5.1 (Fisheries and Freshwater Resources) and 5.2 (Marine Resources) of the EAC Application/EIS. The Proposed Project will not lead to a reduction in the quantity of quality of fish habitat. The loss of riparian and in-stream habitat will be offset by the construction of a new 770m groundwater-fed channel which will provide increased habitat for anadromous salmonids and resident Cutthroat Trout. The Proposed Project will not lead to a reduction in the quality of marine habitat. Any loss of marine habitat will be offset and potential effects on marine resources will mitigated through the planning and implementation of known and effective measures and practices. All potential residual effects were determined to be negligible or not significant.

Issue/Theme	Response
10. Noise: General	A detailed assessment of potential noise effects of the Proposed Project is presented in Volume 2, Part B – Section 9.2 of the in the EAC Application/EIS. Construction and operational noise levels were predicted using computer noise models for various construction phases and operational scenarios. Following the application of proposed mitigation (e.g., layout, schedule screening, equipment maintenance), potential residual noise effects of the Proposed Project were determined to be negligible. The SCRD noise bylaw was considered as part of the assessment.
11. Terrestrial wildlife and vegetation: General	A detailed assessment of potential wildlife and vegetation effects of the Proposed Project is presented in Volume 2, Part B – Section 5.3 of the EAC Application/EIS. Potential effects were assessed for the following selected valued components: ▪ Amphibian species at risk ▪ Western screech owl, Common nighthawk, Northern goshawk Band-tailed pigeon and Marbled murrelet; ▪ Roosevelt elk and grizzly bear; ▪ Environmentally sensitive ecosystems; ▪ Ecosystems at risk; and ▪ Plant species a risk. Following the application of proposed mitigation (e.g., design features and operational requirements, environmental management planning, habitat enhancement, progressive reclamation, etc.), potential residual effects were determined to be negligible or not significant. Cumulative effects on grizzly bear were determined to be significant however the Proposed Project is not predicted to contribute to the potential mortality of the species.
12. Air quality: General	A detailed assessment of potential air quality effects of the Proposed Project is presented in Volume 2, Part B – Section 5.7 of the EAC Application/EIS. Proposed mitigation such as enclosing material drop areas and use of mist sprays were incorporated into the air quality model develop to assess particulate matter concentrations (TSP, PM_{10} and $PM_{2.5}$) at the closest potential receptors sites. NO_2 and SO_2 predictions were also determined for sensitive receptor sites. Following the application of proposed mitigation, all potential air quality effects were determined to be negligible or not significant.
13. Documentation of agency consultation, including DFO	Documentation of government agency consultation is provided in Volume 1, Part A – Section 3 of the EAC Application/EIS. Key issues raised by government agencies and First Nations are presented and the nature and extent of their involvement is described, including participation on the Technical Working Group established to review the Proposed Project. A summary of the federal EA review, including DFO's involvement is specifically addressed and responses to concerns related to potential effect effects on fish and fish habitat are provided. Detailed issues tracking tables are provided in Volume 4, Part G – Section 22.0: Appendix 2-A (Technical Working Group), Appendix 2-B (Aboriginal), and Appendix 2-C (Public) of the EAC Application/EIS.

Issue/Theme	Response
14. Alternatives to the Proposed Project	Alternatives to the Proposed Project and the rationale for selecting the preferred alternative are provided in Volume 1, Part A – Section 2.8 of the EAC Application/EIS. Also included are alternative means of carrying out the Proposed Project (e.g., alternative locations, transportation, mine layout, processing, loading and barging layouts, and mining methods). Criteria considered in the alternative assessment are environmental effects, social effects, cost effectiveness, and technical applicability.
15. Cumulative effects	Potential cumulative effects of the Proposed Project and other certain and reasonably foreseeable projects and activities have been assessed for all non-negligible residual effects (i.e., for all potential effects of the Proposed Project determined to be significant or not significant following the application of proposed mitigation) in accordance with an assessment methodology that reflects accepted EA practice in BC and Canada. The significance of potential cumulative residual effects was characterized for the following: ▪ Marine mammals – behavioural disturbance ▪ Amphibian species at risk – barriers to movement, change in mortality, habitat loss ▪ Roosevelt elk – barriers to movement, change in mortality, habitat loss ▪ Grizzly bear – change in mortality, habitat loss ▪ Environmentally sensitive ecosystems – loss of extent ▪ Ecosystems at risk – loss of extent ▪ Air quality indicators – increase in $PM_{2.5}$ (24 hr, annual), PM_{10} (24 hr), TSP (24 hr, annual) ▪ Real estate – change in real estate value ▪ Marine navigation – interference with navigation use and navigability due to Project-related vessel traffic ▪ Harvesting fish and wildlife – change in environmental setting ▪ Recreation and tourism – change in environmental setting ▪ Visual quality – change in visual quality ▪ Heritage resources – changes to heritage resource integrity, context and accessibility ▪ People – Human health (air quality and particulate matter). All potential cumulative residual effects were determined to be negligible or not significant except net effects to grizzly bear; cumulative residual effects to the threatened Squamish-Lillooet Grizzly Bear Population Unit were determined to be significant due in large part to vehicle collisions that might result from the development of new logging roads. Grizzly bear have not been observed within the Proposed Project area and the Proposed Project is not predicted to contribute to the potential mortality of the species. Potential cumulative effects on Aboriginal rights, including current use, have also been assessed. Cumulative effects assessments are presented in the relevant sections of Volume 2, Part B of the EAC Application/EIS and summarized in Volume 3, Part D, Section 15.1.7.
16. Issues Tracking process	Issues tracking tables that describe issues and concerns raised and the degree to which they have been considered are addressed are provided. Detailed issues tracking tables are provided in Volume 4, Part G – Section 22.0: Appendix 2-A (Technical Working Group), Appendix 2-B (Aboriginal), and Appendix 2-C (Public) of the EAC Application/EIS.

Issue/Theme	Response
17. Accidents and Malfunctions	Potential effects of Project-related accidents, malfunctions and unplanned events have been assessed. The following potential accidents, malfunctions and unplanned events – and associated mitigation - are presented in Volume 3, Part G – Section 15.4.1 of the EAC Application/EIS: ▪ Geohazards: Earthquake-related ground movements and land-based mass movements; ▪ Power outages; ▪ Accidental discharge of sediment or fines into watercourses; ▪ Accidental hazardous material spills – Land and marine based; and ▪ Vessel and barge accidents (e.g., barge capsizing). – Aggregate spills. Project residual effects of Project-related accidents, malfunctions and unplanned events were determined to be negligible or not significant.
18. Concern for Howe Sound: General	BURNCO understands this concern for Howe Sound and is a proud steward of the Proposed Project site and surrounding area. BURNCO is committed to avoiding, reducing or otherwise mitigating potential effects of the Proposed Project through design features, best management practices and other measures described in Volume 3, Part G - Section 18. The EAC Application/EIS provides technically and economically feasible mitigation measures which first avoid and second reduce potential adverse effects for all VCs. VCs were assessed across all phases of the Proposed Project lifecycle (construction, operations, reclamation and closure), including Proposed Project activities, accidents and malfunctions and cumulative effects. The conclusion of the assessment is that, with the application of design considerations and identified mitigation, no significant adverse effects will result from the Proposed Project.

Issue/Theme	Response
19. Monitoring: who will be responsible?	Details regarding the proposed environmental management and monitoring programmes for the Proposed Project are provided in Volume 3, Part E – Section 16 and 17 and are summarized below. BURNCO commits to funding for these monitoring initiatives. Environment monitoring plans will be developed by qualified environmental professionals and implemented to achieve compliance with EA certificate conditions and with conditions of all required permits and approvals. Monitoring will consist of two main components: compliance monitoring and effects monitoring. Compliance monitoring will occur during all phases of Proposed Project activities as a part of the Proposed Project construction and operational Environmental Protection Plans (EPPS). Compliance monitoring will include assessment of Proponent and contractors' environmental performance using specifically developed performance indicators and benchmarks. Where possible, an adaptive management approach will be used to modify management plans as needed based on the results of the monitoring program. BURNCO will submit a report to the BCEAO on the status of compliance with the Certificate Conditions, at the following times: ▪ At least 30 days prior to the start of Construction; ▪ On or before January 31 in each year after the start of Construction; ▪ At least 30 days prior to the start of Operations; ▪ On or before January 31 in each year after the start of Operations; ▪ At least 30 days prior to the start of Closure and Reclamation; ▪ On or before January 31 in each year after the start of Closure and Reclamation; and ▪ Within 30 days of completing Closure and Reclamation. Effects monitoring will include periodic sampling or studies on/of groundwater, vegetation, wildlife, fish, air quality, surface water and aquatic health. The studies will be conducted with a Proposed Project study area (receiving environment) and a reference area. Monitoring plans will establish timelines and schedule for each monitoring activity (e.g., give years for post-construction monitoring). Monitoring data will be assessed against Proposed Project-specific guidelines which will be developed based on Canadian and BC guidelines and baseline benchmarks.
20. Assessment methods	The Assessment Methodology for the EAC Application/EIS reflects accepted EA practice in BC and Canada in accordance with: ▪ BCEAO Guideline for the Selection of Valued Components and Assessment of Potential Effects (BCEAO 2013[14]), ▪ Operational Policy Statement: Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act (CEA Agency 2007[15]), ▪ Addressing Cumulative Environmental Effects. A Reference Guide for the Canadian Environmental Assessment Act (CEA Agency 1994[16]), ▪ Cumulative Effects Practitioners Guide (CEA Agency 1999[17]), and

[14] BC EAO (Environmental Assessment Office). 2013. Guideline of the Selection of Valued Components and Assessment of Potential Effects. Available at: http://www.eao.gov.bc.ca/pdf/EAO_Valued_Components_Guideline_2013_09_09.pdf. Accessed January 15, 2015.

[15] CEA Agency. 2007. Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act. Available at: https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=1F77F3C2-1. Accessed March 2015.

[16] CEA Agency. 1994. Addressing Cumulative Environmental Effects. A Reference Guide for the *Canadian Environmental Assessment Act*. Prepared by the Federal Environmental Assessment Office. November 1994.

[17] CEA Agency. 1999. Cumulative Effects Practitioners Guide. Prepared for the Canadian Environmental Assessment Agency. Prepared by the Cumulative Effects Working Group and AXYS Environmental Consulting Ltd. February 1999.

Issue/Theme	Response
	▪ A Reference Guide for the Canadian Environmental Assessment Act: Determining Whether a project is Likely to Cause Significant Environmental Effects (FEARO 1994a[18]). A detailed methods framework is provided in Volume 2, Part B – Section 4 of the EAC Application/EIS.
21. Health effects from potential air quality impacts	A detailed assessment of potential public health effects of the Proposed Project is presented in Volume 2, Part B – Section 9.1 of the EAC Application/EIS. Potential effects of the Proposed Project on human health assessed considered activities contributing to air emissions, deposition of particulate matter to terrestrial environments, and emission of substances to aquatic environments. Following the application of proposed mitigation, all potential health effects were determined to be negligible or not significant.
22. Potential effects on glass sponge reefs.	A detailed assessment of potential effects on marine resources, including marine benthic communities, is presented in Volume 2, Part B –Section 5.2 of the EAC Application/EIS. Glass sponges are a group of filter feeding organisms which can form large sponge reefs that provide habitat for other marine invertebrate and fish species. Glass sponges in Howe Sound live at depths as shallow as -20 m (chart datum). BURNCO has included glass sponges in the assessment of potential effects on marine resources. Although no glass sponges were observed during the dive and towed video surveys of the Proposed Project area, foreshore and sub-tidal nearshore conducted for the assessment, their known occurrences throughout Howe Sound have been documented. The marine footprint of the Proposed Project does not overlap with any known or mapped locations of glass sponges or glass sponge reefs occurrences. Potential residual effects of propeller scour and aggregate spills on glass sponges were assessed. Propeller wash velocities at the depths at which glass sponges occur are predicted to be within the same magnitude as tidal currents present at this depth. With the application of proposed mitigation, the likelihood of an aggregate spill adversely affecting glass sponge colonies is low. The significance of potential residual effects on marine benthic communities, including glass sponges, were determined to be negligible or not significant.

[18] FEARO (Federal Environmental Assessment Review Office). 1994a. A Reference Guide for the Canadian Environmental Assessment Act: Determining Whether a Project is Likely to Cause Significant Environmental Effects. Prepared by the Federal Environmental Assessment and Review Office. Hull, Quebec. 23 pp. Available at: http://www.ceaa-acee.gc.ca/D213D286-2512-47F4-B9C3-08B5C01E5005/Determining_Whether_a_Project_is_Likely_to_Cause_Significant_Adverse_Environmental_Effects.pdf. Accessed July 2014.

Issue/Theme	Response
23. Hours of operation; plans for expansion	The Proposed Project will be in operations 8 to 10 hrs/day, 260 days/year (i.e., 5 days/week). The frequency of barge loading will be one every other day and it will take approximately 2 to 3 hrs to load each barge. All operational work will occur during seasonal daylight hours. Additional details regarding Proposed Project operations are provided in Volume 1, Part A – Section 2 of the EAC Application/EIS.
24. BCEAO Process general	Additional details regarding the BCEAO environmental assessment review process is provided in Volume 1, Part A –Section 3.1.2. of the EAC Application/EIS. See also the BCEAO and CEAA Joint Response to Public Comments regarding the EA Process for the proposed BURNCO Aggregate Project.

3.3.2.3 Consultation and Communications Materials

The following materials will be used to support consultation and communications activities during Application Review.

- Public Notice - advertising Public Comment Period and Public Information Sessions in local newspapers: North Shore News, The Chief, The Local Weekly News, Coast Reporter, and the Bowen Island Undercurrent (see Table 3-12 for publication details). The content and format of the public notice will be in accordance with the joint BCEAO/CEA Agency template and will be approved by the BCEAO/CEA Agency prior to publication
- Letter to identified Stakeholder Groups;
- BURNCO website materials;
- Public Information Session storyboards and presentation materials:
  - Plain language EA summary document to be printed and made available as a handout to Public Information Session attendees, also to be posted to BURNCO project website
  - Key Issues Q&A document to be printed and made available as a handout to Public Information Session attendees, also to be posted to BURNCO project website
  - Copies of all Public Information Session storyboards
- EAC Application/EIS; available to view at Public Information Sessions and at local public libraries: Gibsons, Bowen Island, West Vancouver, Squamish and Sechelt;
- Public issue tracking and response documentation; and
- Final Public Consultation and Communications Report (due 30 days after the close of the Public Comment Period).

The timing for the development and use of these materials is presented below.

3.3.2.4 Proposed Public Consultation Schedule

Table 3-14 describes the key activities associated with the public consultation and communications activities.

Table 3-14: Public Consultation and Communications Program Schedule: Application Review

Activities	Target Date	Materials Requires	Comments / Requirements
Submit Public Information Session plan consultation materials to BCEAO/CEA Agency to review.	Q3, 2016. Timing to be confirmed.	Public Information Session Plan; Public Notice; Letter to identified Stakeholder Groups; Public Information Session storyboards and presentation materials	
Public Notice	See Table 3-12	Approved Public Notice	BCEAO/CEA Agency to approve.
Letter to Stakeholder Groups	Same time as first Ad.	Letter to identify Stakeholder Groups and approved distribution list.	BCEAO/CEA Agency to approve distribution list.
Meetings and site tours with Stakeholder Groups	Offered in letter. At their convenience.		
Meetings and site tours with MLAs	Offered in letter. At their convenience.		
Formal Public Comment Period	45 days.		Formal public comment period to commence 7 days after public notice of availability of EAC Application/EIS
Distribution of Application/EIS	Same time as first Ad.	Hard copies of EAC Application/EIS.	Local public libraries: Gibsons, Bowen Island, West Vancouver, Squamish and Sechelt
Public Information Sessions	Within 2 weeks of start of Public Comment Period.	Storyboard and maps, plain language summary	Computer available so that comments can be submitted directly to BCEAO.
Written public comments		Public Information Session Comment Forms	
Issue Tracking	Within 30 days of close of comment period.	Public Issue Tracking template.	Using same tracking log template used during Pre-Application.
Final Public Consultation and Communications Report	30 days after close of Public Comment Period.		

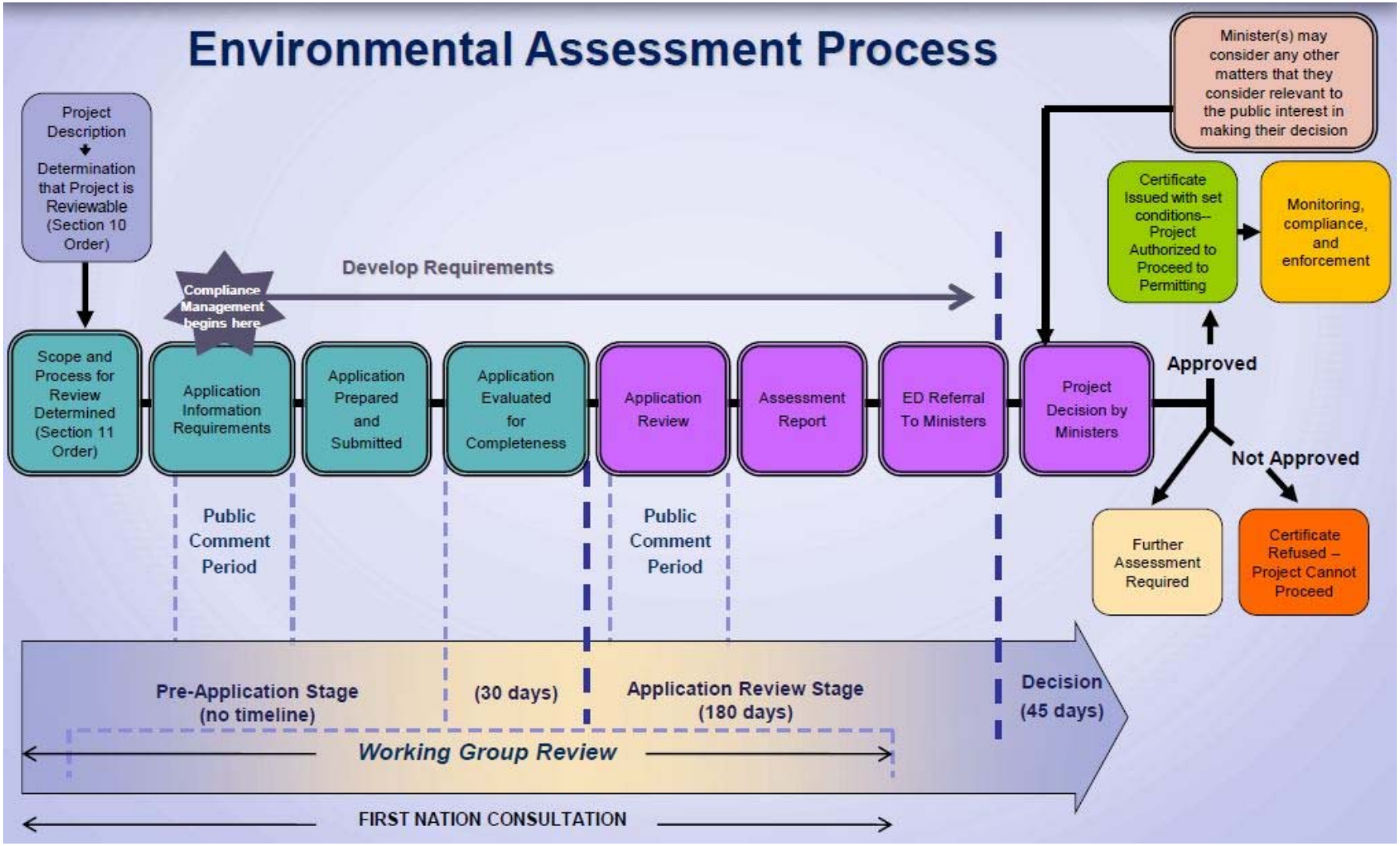


Figure 3-1: BCEAA Process (extracted from BCEAO 2015)

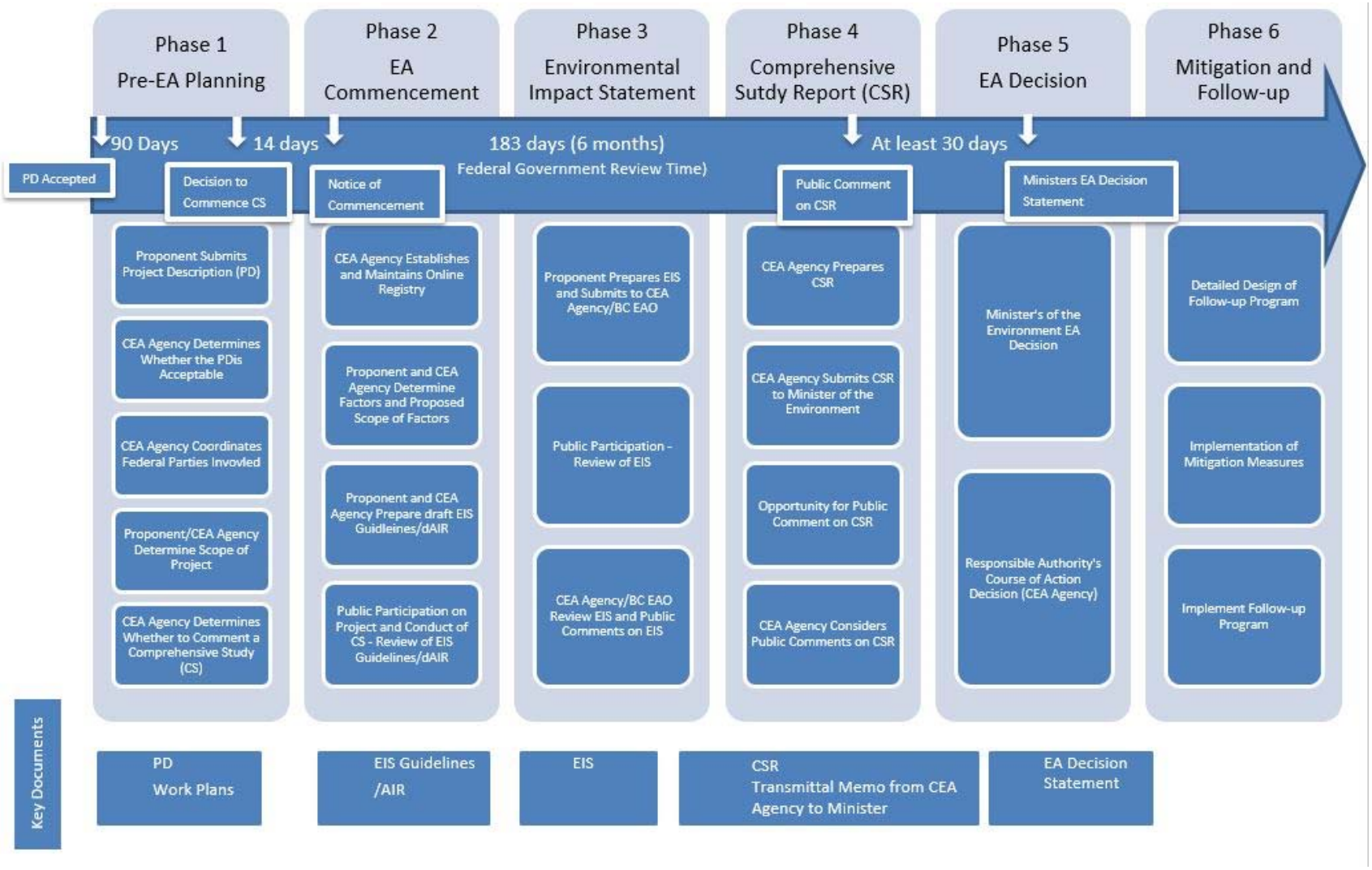


Figure 3-2: History of the Project in the Former CEAA Review Process (Extrapolated from handout provided by CEAA at working group meeting)