Delta Grinding Facility

Summary of the Project Description

Pursuant to the *Canadian Environmental Assessment Act, 2012*

Lehigh Hanson Materials Limited

March 2019

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Tables

Abbreviations

Term	Definition
AIR	Application Information Requirements
%	Percent
3D	Three-dimensional
AECOM	AECOM Canada Ltd. (Architecture, Engineering, Consulting, Operations, and Maintenance)
ALR	Agricultural Land Reserve
AIA	Archeological Impact Assessment
AOA	Archeological Overview Assessment
BC	British Columbia
BC Ferries	British Columbia Ferry Services Inc.
BCEAA	British Columbia *Environmental Assessment Act*
BIEAP	Burrard Inlet Environmental Action Program
BMP	Best (environmental) management practice
CAC	Criteria Air Contaminant
CDF	Coastal Douglas-fir (biogeoclimatic zone)
CDFmm	Coastal Douglas-fir moist maritime (biogeoclimatic zone and subzone)
CEA Agency	Canadian Environmental Assessment Agency
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CMTs	Culturally Modified Trees
CO	Carbon monoxide
CO_2	Carbon dioxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRA	Commercial, Recreational, or Aboriginal
DFO	Fisheries and Oceans Canada (or Department of Fisheries and Oceans)
DPM	Diesel Particulate Matter
DWT	Dead Weight Tonnes
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	British Columbia Environmental Assessment Office
ECCC	Environment and Climate Change Canada
FAA	*Fisheries Act* Authorization
FLNRORD	BC Ministry of Forests, Lands, Natural Resource Operations & Rural Development
FREMP	Fraser River Estuary Management Program
GGBFS	Ground Granulated Blast Furnace Slag
GBFS	Granulated Blast Furnace Slag
Ha	Hectare
ICG	Indigenuity Consulting Group Inc.
I/O	Input and output
ILO	International Labour Organization
Kg	Kilogram

Term	Definition
Km	Kilometre
LEED	Leadership in Energy and Environmental Design
LRTW	Least-Risk Timing Window
M	Metre
m^2	Square metre
m^3	Cubic metre
m^3/h	Cubic metre per hour
MCC	Motor Control Centers
MVAAQO	Metro Vancouver's Ambient Air Quality Objectives
Mg	Milligram
mg/Nm^3	milligrams per cubic metre at standard temperature of 25 C and pressure of 1 kilopascal
MGO	Marine Gas Oil
Mm	Moist Maritime (biogeoclimatic subzone)
MOECCS	BC Ministry of Environment and Climate Change Strategy
Mt CO_2e	Carbon dioxide equivalent tonnes
MW	Megawatt
N_2O	Nitrous oxide
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides of various species
OECD	Organization for Economic Co-operation and Development
PHRD	Provincial Heritage Registry Database
PM_{10}	Particulate matter that is 10 micrometres or less in diameter (includes $PM_{2.5}$)
$PM_{2.5}$	Particulate matter that is 2.5 micrometres or less in diameter
PNW	Pacific Northwest of the United States of America, usually consisting of the states of Oregon, Washington, and Alaska
RPR	Reviewable Projects Regulation of BCEAA
SARA	*Species at Risk Act*
SCC	Supreme Court of Canada
SCM	Supplementary Cementitious Material
Slag Cement	Portland Cement blended with GGBFS
SO_2	Sulphur dioxide
SO_x	Sulphur oxides of various species
sp.	Species (unknown or unspecified)
spp.	Species as a plural
SRKW	Southern Resident Killer Whale
T	Tonne (also known as a metric ton)
t/h	Tonnes per hour
TFN	Tsawwassen First Nation
TFNFA	Tsawwassen First Nation Final Agreement
Tpy	Throughput yield
TSP	Total Suspended Particulates
USA	United States of America

Term	Definition
V	Volt
VC	Valued Component
VFPA	Vancouver Fraser Port Authority
VOC	Volatile Organic Compound
WMA	Wildlife Management Area

1. General Information and Contacts

Lehigh Hanson Materials Limited proposes to construct, operate and decommission a grinding facility to manufacture Supplementary Cementitious Material (SCM) adjacent to its existing cement production facility located at 7753 Berg Road, on Tilbury Island in Delta, British Columbia (BC) (the Site; Figure 1-1).

The name of the project is the Delta Grinding Facility (the Project).

1.1 Project Overview

Lehigh Hanson Materials Limited is proposing to construct, operate and decommission an SCM grinding facility with a marine terminal (the Facility), adjacent to its existing Delta Cement Plant, on lands owned by Lehigh Hanson Materials Limited that are zoned for industrial use (see Figure 1-1, Photo 1-1 and Photo 1-2). Along with water and aggregates, cement is the binding component of ready-mix concrete – the world's most widely used construction material.

Photo 1-1 View westward of the existing Lehigh Cement Facility, with the location of the proposed Project in the foreground

Photo 1-2 View northward of the Fraser River, with the location of the proposed Project in the foreground

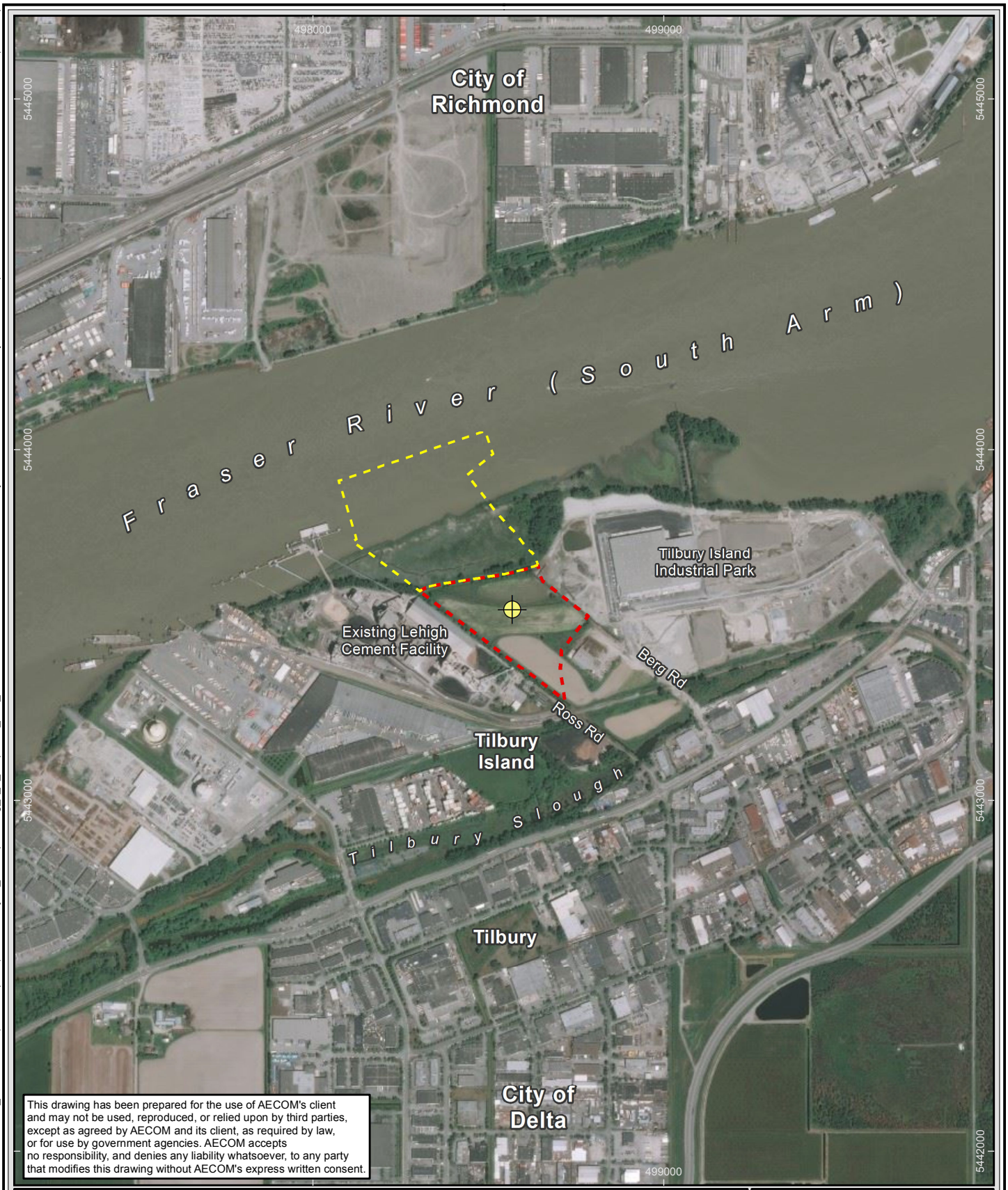
SCMs replace cement in concrete and are made from by-products that originate from steel mills, blast furnaces, and coal-fired power generation plants (e.g., slag, silica fume [microsilica], and fly ash). Re-using these materials has the benefit of improving the hardness, durability, and porosity of concrete, while also reducing the volume of greenhouse gases associated with the production of cement (by up to 50%). With greater demand for green-building projects certified by Leadership in Energy and Environmental Design (LEED) and other rating programs, and changing building codes, SCMs will become critical for the continued sustainable use of concrete. Further information on the benefits of SCMs is provided in Section 2.1.

Lehigh Hanson Materials Limited is proposing to import and store Granulated Blast Furnace Slag (GBFS), a by-product of the iron and steel industry, which will be ground to a suitable fineness (Ground Granulated Blast Furnace Slag or GGBFS) and mixed with cement to produce slag cement. The Project includes construction of a grinding facility and associated dust-collection equipment, raw-material stockpiles, storage silos, pneumatic piping connecting to the Delta Cement Plant, and a covered conveyor leading to a new marine terminal. The Facility is expected to have an annual nominal production capacity of 650,000 t when fully operational, and to employ approximately 14 people. While there will be some use of existing infrastructure at the Delta Cement Plant, there are no changes to cement production or production processes at the Delta Cement Plant. The SCM is a separate product offering, catering to a distinct market and with its own production process.

The Project will be developed in two stages:

Stage 1 will entail construction and commissioning of the grinding facility and associated infrastructure. Materials will be shipped through the existing marine terminal at the adjoining Delta Cement Plant. Stage 1 is expected to be complete in 15 months excluding pre-construction and Site preparation. Preliminary design for Stage 1 is expected to be completed to support the effects assessment process in the event an environmental assessment is required.

Stage 2 will entail construction and commissioning of the marine terminal and conveyor belt system, and is expected to be complete in 16 to 22 months, excluding pre-construction and Site preparation, depending on the chosen configuration. The design for Stage 2 will remain conceptual, and the timing of construction is dependent on market conditions.



Basemapping from Bing, DataBC and AECOM 2018.

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NAD 1983 UTM Zone 10N

Legend

Project Location

Approximate Boundary of Project

Stage 1

Stage 2

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group
Location: Tilbury Island, Delta, BC

Proposed Facility Location on Tilbury Island, Delta, British Columbia

January 2019

AECOM

Figure 1-1

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1.2 Proponent Overview

The Project will be designed, built, operated and decommissioned by Lehigh Cement, a division of Lehigh Hanson Materials Limited, part of the Heidelberg Cement Group. The Heidelberg Cement Group is one of the world's largest building materials companies, with about 60,000 employees at more than 3,000 production facilities in 60 countries on five continents. Heidelberg Cement acquired its Canadian operations in 1993, and among the facilities it currently maintains is the Delta Cement Plant operating since 1978, together with extensive aggregate deposits, and many ready-mix concrete plants throughout BC. Lehigh Hanson Materials Limited has no other projects that have previously sought, or are currently seeking, a BC Environmental Assessment Certificate (EAC).

1.2.1 Commitment to Sustainability

Sustainability is one of the core leadership principles of the Heidelberg Cement Group, and part of the corporate strategy. All subsidiaries of the Heidelberg Cement Group operate under Group-wide leadership principles that build the foundation of a common management culture across all geographies. The Heidelberg Cement Group is committed to complying with all applicable environmental laws, standards, and other requirements, and takes a proactive and long-term view of environmental matters to prevent pollution and continuously improve environmental performance.

1.2.2 Proponent Contact Information

This Project Description has been prepared on behalf of Lehigh Hanson Materials Limited by AECOM Canada Ltd. (AECOM). Contact information for Lehigh Hanson Materials Limited and AECOM, including company representatives, is provided in Table 1-1.

Table 1-1 Project Contact Information

Proponent: Lehigh Hanson Materials Limited	
Project Name: Project Website: Proponent Address:	Delta Grinding Facility *Currently Under Development* Lehigh Cement 7753 Berg Road, Delta, BC, Canada, V4G 1B8
Senior Executive:	Chris Ward President – Region Canada Chris.Ward@LehighHanson.com +1 780 420 2504 Lehigh Hanson Materials Limited 12640 Inland Way NW, Edmonton, AB, Canada, T5V 1K2
Project Representative:	Sophie Mullen Director, Sustainable Resource Development Sophie.Mullen@LehighHanson.com +1 604 812 6116 Lehigh Hanson Materials Limited 8955 Shaughnessy Street, Vancouver, BC, Canada, V6P 3Y7
Consultant: AECOM Canada Ltd.	
Address: Phone: Fax:	3292 Production Way, Floor 4 Burnaby, BC, Canada, V5A 4R4 +1 604 444 6400 +1 604 294 8597
Representative:	Joanne Petrini Associate Vice President, Environment, BC and Yukon joanne.petrini@aecom.com

1.3 Engagement and Consultation

Lehigh Hanson Materials Limited has identified the following groups and organizations to be consulted and engaged with as part of the environmental assessment (EA) of the Project:

- Indigenous groups
- Federal Government
- Provincial Government
- Local Government
- Landowners and resource users on Tilbury Island

Sections 1.3.1 and 1.3.2 present the Indigenous groups, governmental organizations, local communities, and stakeholders identified to-date, and engagement and consultation activities that have been undertaken. During the EA process, further engagement with identified parties is planned. It is also anticipated that the list of consultees will evolve.

1.3.1 Indigenous Groups

Lehigh Hanson Materials Limited has identified both Indigenous groups and organizations that provide referral support to Indigenous groups listed in Table 1-2 as having Indigenous rights and potential interest in the Project. A summary of consultation and engagement to-date is provided in 13.2. Lehigh Hanson Materials Limited will develop an Indigenous Engagement Plan in collaboration with Indigenous groups.

Table 1-2 Indigenous Groups

Indigenous Group (in alphabetical order)		
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	Musqueam Indian Band
Penelakut Tribe	Seabird Island Band	Semiahmoo First Nation
Stz'uminus First Nation	Tsleil-Waututh Nation	Tsawwassen First Nation
Referrals Offices		
People of the River Referrals Office (PRRO). PRRO is an agency that works for multiple Stó:lō Nations, including Shxw'ow'hamel First Nation, Soowahlie First Nation, Sq'ewá:lxw (Skawahlook) First Nation, Stó:lō Nation, and Stó:lō Tribal Council, by providing a screening mechanism for referrals.		

1.3.2 Stakeholders

Stakeholders for this Project are defined as individuals or organizations interested, affected, or otherwise having a stake in the Project, or individuals and organizations that may be affected by the Project. A stake in the Project by an individual or organization may be real or perceived, and can be financial or non-financial. Table 1-3 lists identified stakeholders and the rationale for consultation and will be refined as the Project evolves.

Table 1-3 Project Stakeholders

Stakeholder	Rationale for Consultation
Federal Government	
Canadian Environmental Assessment Agency (CEA Agency)	The CEA Agency is responsible for review and permitting of projects that require review under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).
Fisheries and Oceans Canada (DFO)	DFO is responsible for administration and approvals under the *Fisheries Act*.
Vancouver Fraser Port Authority (VFPA)	VFPA is responsible for stewardship of federal port lands and navigation in and around Vancouver, BC, including granting of permits under their remit.
Transport Canada	Transport Canada must approve construction of the marine terminal, in-water works, and shipping, under the *Navigation Protection Act*.
Environment and Climate Change Canada (ECCC)	ECCC administers permits under the Disposal at Sea Regulation of the *Canadian Environmental Protection Act, 1999*.
Provincial Government	
British Columbia Environmental Assessment Office (EAO)	EAO is responsible for review and permitting of reviewable projects under the BC *Environmental Assessment Act* (BCEAA).
Ministry of Forests, Lands, Natural Resource Operations & Rural Development (FLNRORD)	FLNRORD is responsible for a variety of permits for activities taking place on Crown lands, and for dike inspection. Further, the offshore portion of the Facility is situated on Crown lands (water lots) along the South Arm of the Fraser River that have recently come under the jurisdiction of FLNRORD.
Ministry of Environment and Climate Change Strategy (MOECCS)	MOECCS is responsible for a variety of permits for activities taking place that may influence conservation or affect BC's water, land, air, and living resources.
Local Government	
City of Delta	Delta is the municipality where the Project will be located and is responsible for the zoning and permitting of lands and activities.
Metro Vancouver	The Regional District is responsible for management of air quality in greater Vancouver, including the City of Delta.
City of Richmond	Richmond is the municipality adjacent to the one where the Project will be located.
Land Owners and Tilbury Island Resource Users	
FortisBC	The FortisBC Tilbury LNG Liquefaction Plant is nearby, to the west of the Site on Tilbury Island, and is undergoing expansion.
Residents of Nearby Farms	The identified permanent residents closest to the Project are three farm dwellings located approximately 750 m to the south, on 68th Street, south of River Road. No other seasonal or temporary residents were identified within 1 km of the Site.
Tilbury Island Businesses	Tilbury Island is a heavily industrialised area that is home to various businesses. Lehigh Hanson Materials Limited will actively discuss the proposed Project with interested businesses that are located in the area.

1.4 Federal and Provincial Environmental Assessment Thresholds

The Project has the potential to trigger EAs under both federal and provincial processes.

A criterion under the CEAA 2012 Regulations Designating Physical Activities, Section 24 (c) is: *the construction of a new marine terminal designed to handle ships larger than 25,000 DWT, unless the terminal is located on lands that are routinely used as a marine terminal and have been historically used for that purpose, or that are designated for such use in a land-use plan that has been the subject of public consultation.* Stage 2 of the Project will include construction of a marine terminal with a capacity to handle ships greater than 25,000 DWT. While it will be located next to the Delta Cement Plant's marine terminal that has routinely and historically been used as a shipping terminal since 1978, the area where the new marine terminal is to be constructed has not been previously used for that purpose; therefore, the Project will meet this criterion.

Under the Reviewable Projects Regulation (RPR) of BCEAA, Part 2 (Industrial Projects), one review criterion is: *a new manufacturing facility in the hydraulic cement industry with a production capacity of 100,000 t.* The Project is a grinding facility for producing SCM, a component of concrete, with a production capacity greater than 100,000 t, and therefore meets that criterion.

Another RPR criterion considered potentially applicable, under Part 8 (Transportation Projects), is: *a new marine port facility if its construction entails dredging, filling, or other direct physical disturbance of 1,000 m of linear shoreline or more, or 2 hectares (ha) or more of foreshore or submerged land below the natural boundary of a marine coastline or marine estuary*. It is anticipated that Project works along the Fraser River shoreline will result in physical disturbance of up to 0.95 ha of foreshore and submerged land (the foreseen maximum dredging requirement); therefore the Project will not meet this criterion.

In the event that the Project is considered to trigger the federal EA process, Lehigh Hanson Materials Limited anticipates the province to seek to undertake the EA through a substituted process under Section 32 of CEAA 2012, and in accordance with Memorandum of Understanding between the federal government and the Province of BC that establishes expectations, roles and procedures for implementing substitution of EAs in BC (CEAA 2013). Under substitution, the EAO prepares an EA report then both the EAO and the CEA Agency render separate decisions.

1.5 Regional Environmental Studies

The Project is located in a region that has not been the subject of federal regional environmental studies. The site of the proposed Project is surrounded by several projects that have been subject to environmental assessment (under both the provincial and federal review processes) including the WesPac Tilbury Marine Jetty Project, South Fraser Perimeter Road Project, George Massey Tunnel Replacement Project, Vancouver Airport Fuel Delivery Project, and the Roberts Bank Terminal 2 Project. Publicly available information from these projects, which can inform the effects assessment of the Delta Grinding Facility, will be drawn upon.

2. Project Information

2.1 Project Purpose and Rationale

SCMs are the by-products of industrial processes, such as fly ash from coal combustion and blast furnace slag from steel production, and key to the continued sustainable use of concrete. The SCMs market in BC and the PNW is expected to expand over the next several years as a result of changing building codes, construction design mandates, green-building requirements, and the reduction of current SCM (fly ash) availability due to legislative changes. Lehigh Hanson Materials Limited plans to construct, operate and decommission an SCM grinding facility to supply the Canadian and USA Pacific Northwest (PNW) markets to stay ahead of expected SCM demand.

Lehigh Hanson Materials Limited plans to use GBFS as the raw material to produce SCMs. GBFS is the stony waste matter separated from metals during the smelting of steel. Slag cement is hydraulic cement formed when GBFS is ground to suitable fineness, and is used to replace Portland cements (cement) in the production of ready-mix concrete. GGBFS reacts with water to produce cementitious properties.

Slag cement reduces the air emissions at the blast furnace and the volume of material deposited to landfills and, most significantly, GGBFS decreases cement use by as much as 50 percent (%), thereby reducing carbon dioxide (CO_2) emissions from the manufacture of cement. Approximately one tonne of CO_2 is released for every tonne of cement produced. Between 75 kg and 170 kg of CO_2 are saved per cubic metre of concrete by using a 50% slag cement substitution, representing a 42% to 46% reduction in greenhouse gas emissions.

Replacing cement in concrete with a portion of GGBFS reduces the embodied energy in a cubic metre of concrete by 30% to 48%. Raw materials for cement production are gathered through mining operations; manufacture of 1 t of cement requires about 1.6 t of raw materials. Substituting up to 50% of cement with GGBFS (thereby creating slag cement) can save between 170 kg and 380 kg of raw material per cubic metre of concrete (between 130 kg and 290 kg per cubic yard).

2.2 Project Components and Phases

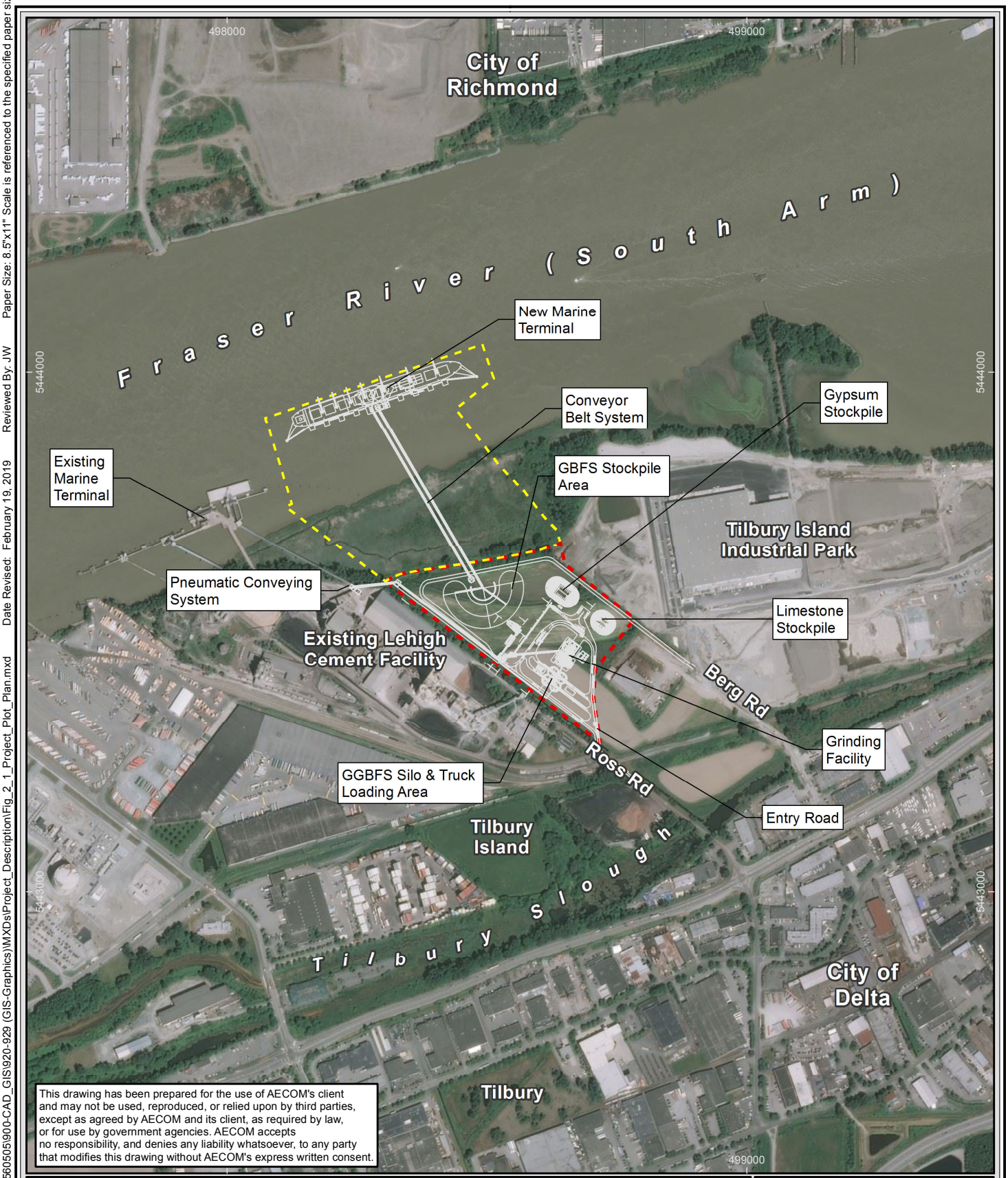
2.2.1 Overview

SCM will be made available for markets in three steps: (1) imported GBFS is delivered to the Facility by vessel and truck and stockpiled; (2) the imported GBFS is processed by adding gypsum and limestone and grinding the mixture in the mill with a natural-gas-fired air system, and, once the required moisture level and particle size is achieved in the mill, the ground material is cooled; (3) the final ground product (GGBFS) is stored in silos until being transferred to trucks or vessels for delivery to customers.

As previously described the Project will be constructed and operated in two stages. A Project plot plan is provided in Figure 2-1.

The Project will be located on Lehigh Hanson Materials Limited-owned lands next to the Delta Cement Plant and will take advantage of some of the existing infrastructure. The existing marine terminal infrastructure will be used for incoming shipments of materials during Stage 1 and outgoing shipments of product during both Stage 1 and Stage 2. There will be no modifications to the existing berth. The extent of use of the existing infrastructure by the new Facility will be limited to the Delta Cement Plant's existing marine terminal, guard house, control room, administrative, and maintenance facilities. Operation of the grinding plant will be integrated with that of the existing Delta Cement Plant. No new administrative building or maintenance facilities are needed for the Project.

There are to be three Project Phases: Construction (described in Section 2.2.2); Operation (described in Section 2.2.3); and Decommissioning (described in Section 2.2.5).



Basemapping from Bing, DataBC and AECOM 2018.

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Metres

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NAD 1983 UTM Zone 10N

Legend

Approximate Boundary of Project

- Stage 1
- Stage 2

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group

Location: Tilbury Island, Delta, BC

Project Plot Plan

February 2019

AECOM

Figure 2-1

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2.2.2 Construction

2.2.2.1 Construction of Stage 1

Construction of Stage 1 will consist of the following blocks of activity:

- Site preparation
- Civil construction
- Mechanical and structural construction
- Electrical and controls
- Commissioning and finishing

Site preparation for construction will include adding structural fill and compaction of the soil for the purpose of supporting building foundations. Infrastructure to be installed early will include underground pipes for supplying process water and natural gas, and for managing rainwater runoff, and any deep foundations that may be specified by geotechnical engineers.

Civil construction will include installing foundations for process equipment, material handling areas, and storage areas, and slip-forming the product storage silos.

Mechanical and structural construction will include installation of the mechanical equipment and it's supporting and auxiliary structures. Equipment to be installed will include the grinding mill, the main fan and filter, the air heater, the material handling equipment, the dust collection system, the closed-loop water cooling system, the product transport system, and the bulk truck loadout equipment. Ductwork, aboveground piping, and other infrastructure will also be installed. The building cladding will be attached and painted or touched up as required.

Electrical and controls will include construction of the new substation with a transformer and incoming power line. All electrical, instrumentation, and control equipment will be installed and interconnecting cables run. Any required upgrades to the control system of the existing Delta Cement Plant that might be needed for control of the grinding plant will be completed at that time.

Commissioning and finishing will commence upon completion of the electrical and controls construction. All equipment will be checked for mechanical operation, electrical operation, and control signal functionality. Control system sequencing and safety interlocks will be tested. After the checkout is complete, the system will be commissioned with material for initial operation through the product storage silos and bulk loadout.

In parallel with the above activities, minor modifications will be made to the existing dock silos and blending system at the Delta Cement Plant to receive SCMs via pneumatic conveying from the new installation. There will be no modifications to the existing berth.

After successful commissioning of the plant, paving, landscaping, and Site cleanup work will be completed.

2.2.2.2 Construction of Stage 2

Stage 2, construction of the marine terminal, with an area of approximately 1.8 ha, will consist of the following blocks of activity (Moffatt & Nichol 2017; 2018):

- Installation of piles
- Installation of deck elements for the marine terminal
- Installation of mechanical systems
- Dredging

To minimize the environmental footprint, “open” pile-supported structures are proposed, as opposed to solid sheet pile bulkhead walls or gravity-based structures such as concrete caissons. Piled structures have minimal contact with

the river bottom and result in the least disruption of established river currents and sedimentation patterns. The structures are also to be placed as far out into the river as practicable to minimize the need for dredging, avoiding the most environmentally sensitive areas closest to shore. It is anticipated that marine terminal components will be fabricated off-site, enabling delivery of fully or partially formed components to the Site, thereby reducing the duration and scale of in-water construction activities.

Installation of piles will be into the deep layers of alluvial sands and silts that the riverbed comprises, providing generally favourable conditions for constructing pile-supported marine facilities. Piles supporting the marine terminal structures will likely be reliant on some combination of end-bearing and skin friction to resist applied loads. Alternative pile materials include tubular steel and precast, pre-stressed concrete.

The total number of piles required is estimated to be between 93 and 105 (the number in the final design will likely be toward the low end of this range). These piles would have a total footprint between 200 m^2 and 220 m^2. The method used to install piles (e.g., vibration or impact hammering) will be finalized once the design of the Facility progresses and a contractor has been chosen. All appropriate Best Management Practices (BMPs) will be adopted for the work with the goal of minimizing any potential effects on the aquatic environment.

Installation of deck elements for the marine terminal will be conducted in a way that minimizes the need for cast-in-place concrete, thereby reducing construction time and minimizing potential effects on the aquatic environment. The marine terminal design has not yet been finalized, and deck elements could be constructed of steel or concrete, or a combination of those materials. If concrete is the chosen material, pile-caps and deck beams would be precast offsite and delivered to the Facility as needed once the piles have been driven.

Installation of mechanical systems will comprise the handling equipment and structures for receiving raw materials at the marine terminal and trestle. Options being considered are of two configurations: travelling loaders and fixed loaders. Either configuration could handle inbound raw materials arriving at the Facility by self-unloading or geared vessels up to Panamax size. A conveyor belt will also be constructed for directly moving raw materials from the marine terminal to the stockpiles. The conveyor belt system will be constructed on piles to minimize disturbance of the foreshore area.

Dredging of sediments will be necessary. The layout of the marine terminal has not yet been finalized, but the alternatives being considered would entail vessels docking as closely as possible to the existing Fraser River navigation channel. This channel is routinely dredged to maintain a draft of up to 11.5 m for tidally assisted vessel navigation. To accommodate a Panamax vessel with a draft of 11.5 m at the marine terminal during all tide stages, a relatively small amount of additional dredging would be needed between the maintained channel and the marine terminal face. The amount of dredging would vary by chosen marine terminal layout, and estimates range from 5,000 m^3 for a travelling loader option to 8,000 m^3 for a fixed loader option.

In summary, conservative estimates[1] of Stage 2 infrastructure are:

- Total number of piles: 105
- Total footprint of piles (contact area with river bed): 220 m^2
- Total area of dredging: 9,500 m^2
- Total volume of dredging: 8,000 m^3
- Total plan area of marine structures (shading area on the water surface): 8,500 m^2

[1] A conservative estimate has been used to capture the largest potential footprint that the marine terminal could have so as to not underestimate the full extent of any potential effect. These estimates overstate the likely footprint and will be refined on final engineering.

2.2.3 Operation

2.2.3.1 Operation of Stage 1

Delivery of Raw Materials

During Stage 1, the inbound GBFS (600,000 t) will arrive by Panamax or Handymax vessels. The GBFS will be lightered onto barges in Plumper Sound and delivered to the existing Delta Cement Plant marine terminal or to other nearby Lehigh Hanson Materials Limited owned barge offloading facilities in Delta and Surrey (the GBFS will then be trucked to the Facility). Crushed limestone and gypsum will arrive at the Facility by barge. Further details about transportation and movement of vessels and barges are provided in Section 2.4.

Product Manufacturing

Front-end loaders and portable stacking belts will be used to place the GBFS into two stockpiles. Each stockpile will store approximately 35,000 t of GBFS. Crushed limestone and gypsum will also be stockpiled on-site (Figure 2-1). The stockpiles will not be covered, because the material is dense (i.e., the material is solid and not easily mobilized), non-toxic and very stable. GBFS, limestone and gypsum will be managed with front-end loaders. Material will be taken from the stockpiles illustrated in Figure 2-1, and placed into hoppers that will convey the material to the grinding mill.

The GBFS, limestone, and gypsum will be ground to the required particle size and dried to the required moisture level in the new grinding mill. The mill will be sized for a nominal production capacity of 90 tonnes per hour (t/h) at 550 m^2/kg product fineness. The ground product (GGBFS) from the mill system will be cooled in a non-contact cooler and then transported to a set of four new 10,000 t storage silos. The product and plant machinery will be cooled with process water, which in turn will be cooled by an evaporative cooling tower. The system will be closed-loop, entailing no discharge of process water. A small amount of make-up water (approximately 5 m^3/h) will be required to replace water evaporated in the non-contact product cooler and the cooling tower. This make-up water will be provided by the utility system of the existing Delta Cement Plant.

Operation of the new facilities will be integrated with the existing Delta Cement Plant. All stationary plant equipment will be run by the Delta Cement Plant central control room, located in the operations building.

Product Export

Half of the GGBFS produced (325,000 t) will be shipped from the Facility through the automated truck loading facility. Two loading lanes are included in the design. Trucks will be loaded for road distribution of the product to concrete ready-mix plants and other consumers. Further details about the transportation of the finished product are provided in Section 2.4.2.

The other half of the GGBFS (325,000 t) will be transferred, via a new pneumatic conveying system at a rate 300 t/h, to the existing blending facility and silos at the Delta Cement Plant marine terminal, before distribution by barge to consumers in the Lower Mainland and PNW.

2.2.3.2 Operation of Stage 2

Delivery of Raw Materials

During Stage 2 the delivery of GBFS and gypsum will be transferred to the new marine terminal. This is the only operating difference between Stage 2 and Stage 1. The new marine terminal, will be large enough to accommodate self-unloading Panamax or Handymax-sized vessels, and conveying the GBFS and gypsum directly from the marine terminal to the stockpile area by the belt conveyor system at a rate of up to 2,000 t/h.

Three alternate design options are currently under consideration for the unloading and loading infrastructure:

- Travelling loader options that would require product arriving by self-unloading vessels to discharge to one of two travelling hoppers equipped with a dust collection system and a feeder (Moffatt & Nichol 2017).

- Fixed loader options that would require product arriving by self-unloading vessels to discharge to a fixed hopper equipped with a dust collection system and a feeder (Moffatt & Nichol 2017).
- Shore crane with slewing and luffing capabilities and, depending on the vessel size and deck configuration, capable of unloading two hatches at once (Moffatt & Nichol 2017).

Product Manufacturing

Product manufacturing in Stage 2 will be the same as that in Stage 1.

Product Export

Delivery of the finished product during Stage 2 will continue in the same way as that in Stage 1.

2.2.4 Facility Maintenance

Successful operation requires that all equipment be maintained regularly. During the operating life of the Facility, routine maintenance will be performed on an on-going basis. Daily and weekly maintenance will include inspection, vibration monitoring, lubrication oil analysis, and adjustments. Less frequently, worn or failed components may be repaired or replaced on certain equipment, such as belt conveyors, piping and ductwork, air flow control dampers, field instruments, and electrical equipment as required.

Semi-annually, the mill will be shut down and worn internal grinding parts will be re-welded or replaced. Every few years or as required, worn or damaged dust collector filter media will be replaced. The most intensive maintenance outages will typically take place once a year in the first quarter, and could result in up to 50 additional contracted personnel working at the Facility for a period of up to three weeks.

Maintenance Dredging

The active nature of sedimentation patterns in the Fraser River would likely necessitate annual maintenance dredging following spring freshets (Moffatt & Nichol 2017). The volume of dredging is estimated to be 5,000 m^3 to 6,700 m^3, with the amount depending on the final design option. The exact volume of material to be removed and the extent of dredge footprint will be refined through the design of Stage 2 infrastructure.

2.2.5 Decommissioning

The grinding, storage, and shipping facilities will be designed for a normal operating life of 40 years but, if the Facility continues to be commercially viable, the operating life could be extended indefinitely through maintenance of, and upgrades to, the equipment and infrastructure. After decommissioning, it is anticipated the Site will be used for another industrial purpose.

When the Facility is decommissioned, remaining raw materials will be processed to product. Mechanical and electrical equipment will be removed, and reused elsewhere or properly disposed of or recycled. Steel structures will be dismantled and sold for scrap. Concrete structures will be demolished to grade. Based on the plant design and operating plan, no contaminated soil or other waste materials will remain at the time of decommissioning.

The marine terminal facilities, once built, are expected to remain in service for an indefinite period, with normal maintenance and upgrades, serving this installation or a successor industry. Thus there is no decommissioning plan for the marine terminal.

2.2.6 Supporting Infrastructure

Other than the Project structures described in Section 2.2.1, there is no additional supporting infrastructure required.

2.3 Utilities

Utilities associated with the plant will include:

- A new underground branch pipeline to transport natural gas from the existing Delta Cement Plant to a new metering station and air heater at the Facility
- A new electrical substation with capacity of approximately 10 megawatts (MW)
- A new underground process water line to convey make-up water from the Delta Cement Plant to the grinding plant process water system, operating in a closed-loop
- Other new utilities and infrastructure systems that will include a compressed air system, an air-conditioned electrical room, motor control centers (MCCs), variable speed drives, I/O cabinets, paved and unpaved roadways and parking areas, and a stormwater management system

All equipment and systems will be owned, operated and maintained by Lehigh Hanson Materials Limited.

2.4 Transportation

2.4.1 Construction of Stage 1

Equipment and construction materials will be sourced domestically or by import, according to price and availability. Approximate quantities of equipment and construction materials associated with site preparation and physical structures are:

- Fill Material: 100,000 m^3
- Concrete: 750 m^3
- Equipment: 2,000 t
- Structural steel: 1,000 t

It is anticipated that most deliveries of construction materials will arrive at the Facility by truck via existing transportation corridors along River Road and Highways 17 and 99, however, opportunities to use the existing Delta Cement Plant marine terminal and rail facilities will be considered. For Site preparation, approximately 10,000 truckloads of structural fill are anticipated. It may be possible to deliver some of this material by barge. During the 15-month main construction period, construction personnel will make 15,000 to 20,000 round trips to work. Approximately 400 truck deliveries will be required for equipment, structural steel, concrete and miscellaneous construction materials.

2.4.2 Operation

Table 2-1 provides a summary of transportation activities for Stage 1 and Stage 2 related to the delivery of raw materials to the Facility and export of final product from the Facility.

2.4.2.1 Transportation during Stage 1 Operation

Delivery of Raw Materials

GBFS will be imported from steel mills in Asia or Europe. Delivery of GBFS during Stage 1 will result in approximately 10 calls per year by Panamax vessels or 14 by Handymax vessels[2] to Plumper Sound where the GBFS will be lightered onto barges and delivered to the marine terminal at the Delta Cement Plant and the Lehigh Hanson Materials Limited-owned barge off-loading facilities at Delta and Surrey depots. It is estimated that 60% of the GBFS will be barged to the Delta Cement Plant, resulting in approximately 75 barges per year[3]. The remaining 40% (240,000 t) of GBFS will be lightered onto barges for transport, and directed to the existing Delta and Surrey depots, from where it will be transported to the Facility by truck, resulting in approximately 30 barge trips and 5,715 truck

[2] Vessel call estimates are based vessel capacity of 65,000 t for Panamax and 45,000 t Handymax vessels.
[3] Barge calls per year estimates are based on a barge capacity of 8,000 t.

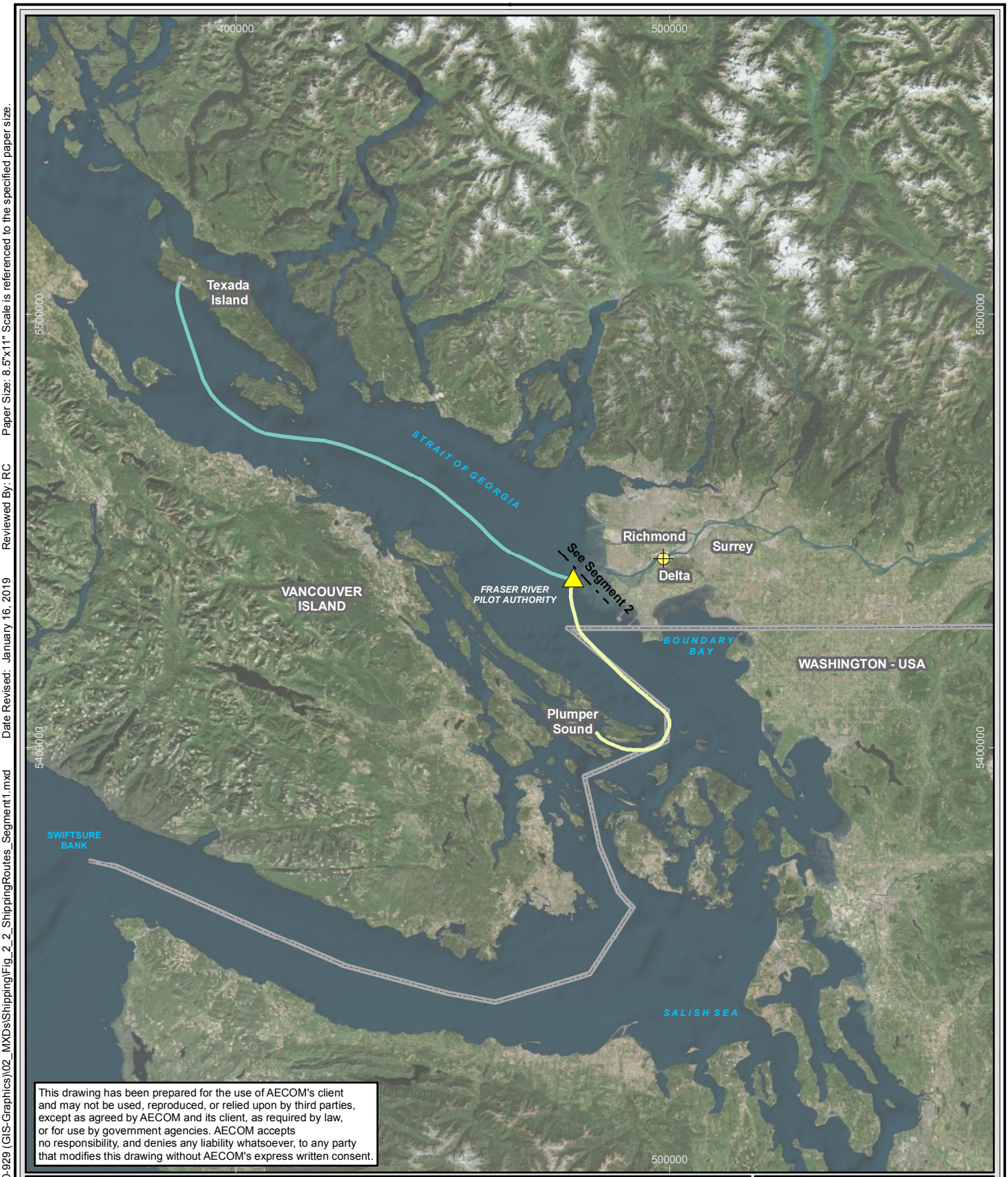
trips[4]. Gypsum (30,000 t per year) from Mexico is delivered by vessel to multiple clients in the PNW before being lightered to barges in Plumper Sound for delivery to the Facility; this will result in 4 barges per year.

Ships will arrive at Plumper Sound from the Pacific Ocean along established shipping routes, through Juan De Fuca Strait. All shipping associated with the Project will be undertaken by qualified shipping and barging companies.

Crushed limestone from Texada Island (35,000 t per year) will be delivered by barge to the existing Delta Cement Plant marine terminal, resulting in 5 barges each year[5].

The delivery routes from Plumper Sound and Texada Island are depicted in Figure 2- 2 and Figure 2-3.

[4] Truck trips estimates are based on trucks with a capacity of 42 t.
[5] Barge calls per year estimates are based on a barge capacity of 8,000 t.



Basemapping from Bing, DataBC and AECOM 2018.

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NAD 1983 UTM Zone 10N

Legend

- Project Location
- Sands Head Lighthouse
- Plumper Sound Lightering Shipping Route
- Texada Island Gypsum Shipping Route

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group
Location: Tilbury Island, Delta, BC

Stage 1 Shipping Routes for Imported Materials (Segment 1)

January 2019

AECOM

Figure 2-2

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\02_MXDs\Shipping\Fig_2_2_ShippingRoutes_Segment1.mxd Date Revised: January 16, 2019 Reviewed By: RC Paper Size: 8.5"x11" Scale is referenced to the specified paper size.

Basemapping from Bing, DataBC and AECOM 2018.

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Metres

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NAD 1983 UTM Zone 10N

Legend

- Project Location
- Receiving Depots
- Sands Head Lighthouse
- Shipping Route to the Facility and Depots

Lehigh Hanson
HEIDELBERGCEMENT Group
Location: Tilbury Island, Delta, BC

Stage 1 Shipping Routes for Imported Materials (Segment 2)

January 2019

AECOM

Figure 2-3

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\02_MXDs\Shipping\Fig_2_3_ShippingRoutes_Segment2.mxd Date Revised: January 16, 2019 Reviewed By: RC Paper Size: 8.5"x11" Scale is referenced to the specified paper size.

Road access to the Project by truck will be via the new road entrance from Ross Road, just south of the Delta Cement Plant operations building. Tilbury Island is in an industrialized area of Delta with access from commercial traffic corridors, such as River Road and the South Fraser Perimeter Highway. Traffic in the immediate area of the Facility and in the River Road area does not interact with residential communities, and Lehigh Hanson Materials Limited will direct trucking providers to use a pre-defined transport route for access to the Facility via Berg Road.

Product Export

During both Stage 1 and Stage 2, the final product will be delivered to customers by truck and barge.

Based on current market assumptions, the 650,000 t of GGBFS produced annually will be distributed equally between the Delta Cement Plant, via the pneumatic conveying system to replace Portland cement in concrete, and customers in the Lower Mainland.

GGBFS (325,000 t) will be transferred, via a new pneumatic conveying system, to the existing blending facility and silos at the Delta Cement Plant marine terminal, before distribution by barge to consumers in the Lower Mainland and PNW. This will result in 54 barges leaving the Delta Cement Plant[6]. The remaining 325,000 t of GGBFS will leave the Facility by truck which will result in 7,917 trucks per year transporting product from the Facility[7].

2.4.2.2 Transportation during Stage 2 Operation

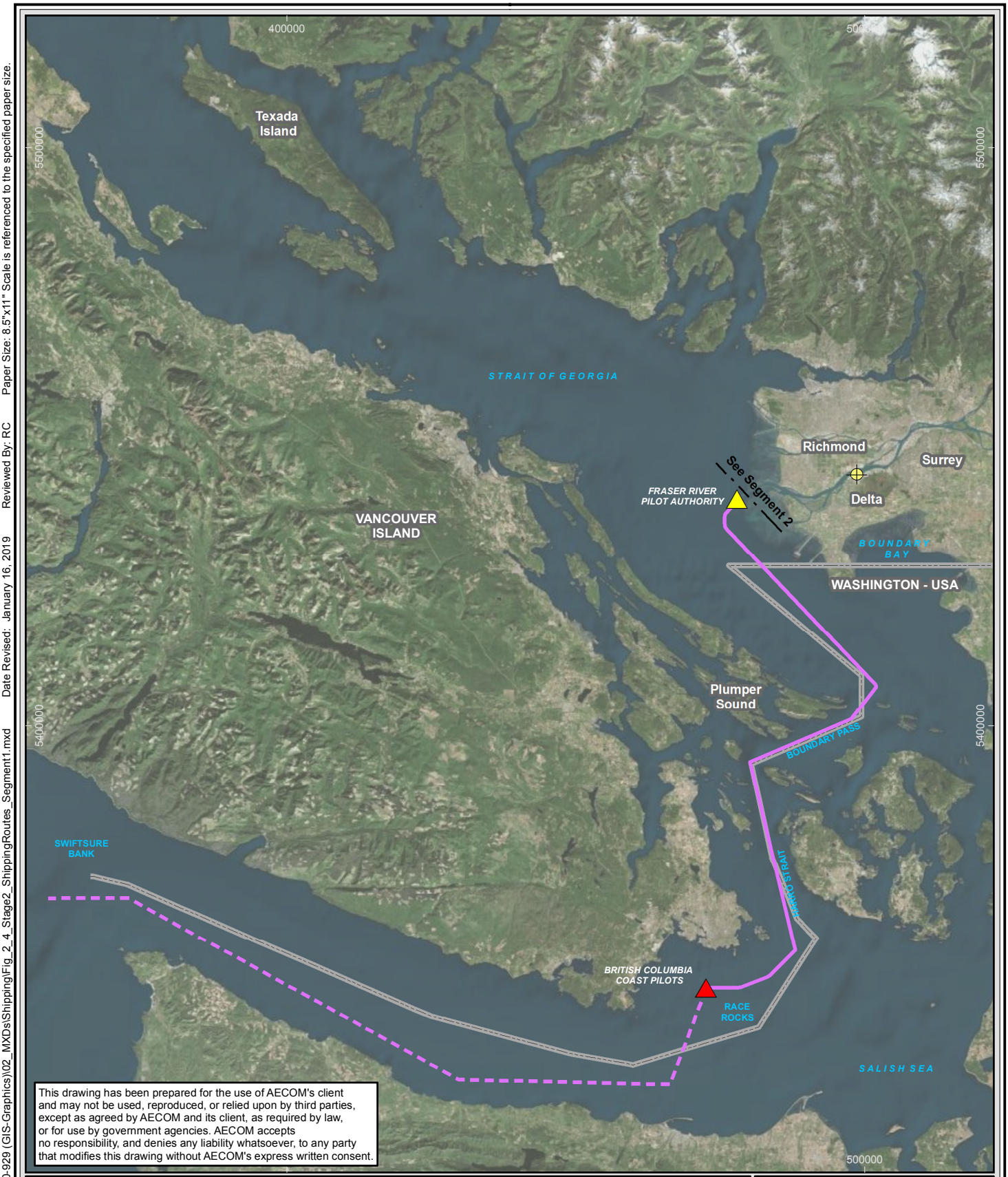
Delivery of Raw Materials

The means of transporting raw materials, specifically GBFS and gypsum, to the Facility during Stage 2 will differ from Stage 1. Stage 2 will involve operating the new marine terminal, large enough to accommodate self-unloading Panamax or Handymax-sized vessels carrying up to 65,000 DWT and 45,000 DWT of cargo, respectively. Stage 2 moves inbound shipping activities for GBFS and gypsum from the existing marine terminal to the new marine terminal. This process eliminates the lightering of vessels and reduces the number of barges and level of truck traffic going to the Facility. The shipping route for the vessels delivering GBFS and gypsum will be the same as that used during Stage 1, but the vessels will no longer lighter, i.e., the vessels will travel directly along prescribed shipping lanes to the Facility. Ships will arrive from the Pacific Ocean along established shipping routes, through Juan de Fuca Strait and the Strait of Georgia, and then enter the South Arm of the Fraser River to the Site. All shipping associated with the Project will be undertaken by qualified shipping and barging companies.

Inbound GBFS will arrive at the Facility by Panamax or Handymax vessels, 10 or 14 vessel calls per year, respectively. Gypsum will also arrive by Panamax or Handymax vessel, necessitating one vessel call per year. These are the same numbers of vessels coming to the Vancouver area as during Stage 1, except that they will now go directly to the Facility instead of lightering to barges.

The delivery routes from international waters and Texada Island are depicted in Figure 2-4 and Figure 2-5. A summary of inbound and outbound shipping activities is provided in Table 2-1.

[6] Barges used for product delivery have lower capacity than those for inbound raw material, as outbound product must travel in covered barges.



Basemapping from Bing, DataBC and AECOM 2018.

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NAD 1983 UTM Zone 10N

Legend

- Project Location
- Sands Head Lighthouse
- Pilot Boarding Point
- Stage 2 Shipping Route

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group
Location: Tilbury Island, Delta, BC

Stage 2 Shipping Routes for Imported Materials (Segment 1)

January 2019

AECOM

Figure 2-4

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\02_MXDs\Shipping\Fig_2_4_Stage2_ShippingRoutes_Segment1.mxd Date Revised: January 16, 2019 Reviewed By: RC Paper Size: 8.5"x11" Scale is referenced to the specified paper size.

Basemapping from Bing, DataBC and AECOM 2018.

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Metres

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NAD 1983 UTM Zone 10N

Legend

- Project Location
- Sands Head Lighthouse
- Shipping Route to the Facility

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group
Location: Tilbury Island, Delta, BC

Stage 2 Shipping Routes for Imported Materials (Segment 2)

January 2019

AECOM

Figure 2-5

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\02_MXDs\Shipping\Fig_2_5_Stage2_ShippingRoutes_Segment2.mxd Date Revised: January 16, 2019 Reviewed By: RC Paper Size: 8.5"x11" Scale is referenced to the specified paper size.

Table 2-1 Summary of Inbound and Outbound Shipping Activities for Stage 1 and 2

Material	Volume (tonnes)	Distribution Method	Number of Trips per Year (conservative estimate)[1]
Stage 1 Inbound			
GBFS	600,000	Panamax or Handymax Vessels (Prior to lightering to barge)	10 Panamax or 14 Handymax
60% of GBFS to existing Delta Cement Plant marine terminal	360,000	Barge	75
40% of GBFS to Delta and Surrey Depots	240,000	Barge	30
40% of GBFS from Delta and Surrey Depots to the Project	240,000	Truck	5,715
Gypsum	30,000	Barge	4
Limestone	35,000	Barge	5
Stage 1 and Stage 2 Outbound			
GGBFS	325,000	Barge	54
GGBFS	325,000	Truck	7,917
Stage 2 Inbound			
GBFS	600,000	Panamax or Handymax Vessels	10 Panamax or 14 Handymax
Gypsum	30,000	Panamax or Handymax Vessels	1
Limestone	35,000	Barge	5

1. The actual number of trips is slightly less because the values presented were rounded up.

2.4.2.3 Increase in Shipping within VFPA Jurisdiction

The Port of Vancouver, which includes Vancouver Harbour, the lower Fraser River, and Roberts Bank, sees approximately 3,160 vessel calls per year. By 2026, this number is expected to grow to 4,380 (VFPA 2018). Stage 2 of the Project will result in a maximum increase of 15 vessels per year in waters within VFPA jurisdiction, which equates to a 0.4% increase from current levels, and a 0.3% increase at 2026 levels.

Data for 2010 to 2011 show an average of 2,379 to 3,000 tug journeys per year up and down the Fraser River (Det Norske Veritas 2012). Assuming each tug is moving a barge, the 168 barge journeys associated with the Project during Stage 1 will increase barge traffic by 5.6% to 7% per year. Stage 2 barge traffic (59 barges) will result in an increase of 1.9% to 2.4% per year.

2.4.2.4 Non-Production Related Transportation

Other transportation associated with the operation of the Facility will be limited to employee vehicles, and service and delivery vehicles. Pedestrian access will be via a new footbridge near the existing operations building.

2.5 Project Finance

The total capital cost for the Project is estimated at $141.5M CAD. This sum is broken into the two stages of the Project; Stage 1 has an estimated cost of $105M CAD; Stage 2 has an estimated cost of $36.5M CAD. These are preliminary estimates and will be revised during the detailed design phase.

As described in Section 2.2.5, the Project facilities will be designed for an operating life of at least 40 years before decommissioning would be contemplated. Even were the facilities to be decommissioned without an extension to that lifespan, it is anticipated that the Site would be acquired for another industrial purpose. The cost of decommissioning

is estimated to be $2 million (in 2018 CAD). Owing to probable re-use of the Site, that cost does not include costs for remediation or reclamation processes.

The Project will generate employment and contracting opportunities during the construction and operation phases. During preparation and construction, the Project will generate approximately 134 person-years of employment in Stage 1, and 24 person years of employment in Stage 2.

Throughout the operation of the Facility, the Project is expected to generate the following employment opportunities:

Project Employees – The Project is expected to employ an average workforce of 14 people for Stage 1 and 15 for Stage 2. Over the minimum 40-year life of the Project, these numbers represent approximately 560 person-years.

Contracted Employment – In addition to Project employees, the Project will hire contractors to provide services for a number of activities, including trucking, scheduled maintenance, and barge and tug operations.

Indirect Employment – Opportunities will be generated as a result of the purchase of goods, services, equipment, and raw materials during operations and construction.

Induced Employment – Construction and operation of the Project will result in increased employment and household income that may promote extra spending in the local economy.

The Operations period is expected to last a minimum of 40 years. The Project will not require any workforce accommodations.

2.6 Project Schedule

Site preparation work will start immediately on receipt of all required regulatory approvals, and will last approximately 12 months. The final schedule will be developed after consultation with Indigenous groups and other users of the area to minimize disruption or schedule conflicts.

The 15-month main construction phase will follow, with two months expected for commissioning activities. The system will enter normal operation approximately 20 months after construction is authorized to start. Preliminary bar-chart construction schedules for Stage 1 and Stage 2 are shown in Table 2-2 and Table 2-3, respectively.

The final schedule will be developed after consultation with Indigenous groups and other users of the area to minimize disruption or schedule conflicts.

Table 2-2 Stage 1 Project Schedule

Stage 1: Delta Grinding Facility																				
Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Site Preparation																				
Grading																				
Site civil works, drainage underground piping																				
Soil densification and deep foundations																				
Phase 2: Construction																				
Construct equipment and silo foundations																				
Slipform product silos																				
Erect mill, filter, feeding equipment, bins, piping																				
Erect silos feed and discharge mechanical																				
Install new substation and transformer																				
Install new power line to substation																				
Construct electrical components																				
Modify upgrade control system																				
Modify existing dock silos																				
Install pneumatic conveying to existing dock silos																				
Commissioning																				
Paving																				
Landscaping																				

Table 2-3 Stage 2 Project Schedule

Stage 2: Marine Terminal Development																				
Month	**1**	**3**	**5**	**7**	**9**	**11**	**13**	**15**	**17**	**19**	**21**	**23**	**25**	**27**	**29**	**31**	**33**	**35**	**37**	**39**
Option 1: Marine Terminal - Travelling Loader																				
Initial consultation with VFPA	■	■																		
Site data collection		■	■	■	■															
Feasibility study					■	■	■	■												
Detailed engineering marine structures								■	■	■										
Procurement package development mechanical equipment								■	■											
Marine structures foundation construction										■	■	■	■	■	■	■				
Detailed Design										■	■	■	■							
Fabrication													■	■	■	■	■	■		
Delivery & Installation																		■	■	■
Marine Terminal - Fixed Loader																				
Initial consultation with VFPA	■	■																		
Site data collection		■	■	■	■															
Feasibility study					■	■	■	■												
Detailed engineering marine structures								■	■	■										
Procurement package development mechanical equipment								■	■											
Marine structures foundation construction										■	■	■	■	■	■					
Detailed Design									■	■	■	■								
Fabrication												■	■	■	■					
Delivery & Installation															■	■	■			

Adopted from Moffatt & Nichol 2017

2.7 Emissions, Noise, Discharges, and Wastes

The EA will include a full assessment of emissions, noise, discharges, and wastes associated with construction and operation of the Project, including greenhouse gases (GHGs).

2.7.1 Construction

A Construction Environmental Management Plan (CEMP) will be implemented that will define procedures for how activities undertaken during the construction will be managed to avoid or mitigate potential adverse environmental effects. The objectives of the CEMP are to:

- Protect valued ecological features of the terrestrial, marine, and atmospheric environments during construction
- Protect human health and ensure the safety of the public and site workers
- Ensure compliance with conditions of permits and approvals granted by environmental regulatory agencies
- Manage potential environmental liabilities

During construction of Stage 1, all liquid and solid wastes will be contained on-site before being sent off-site for disposal to an approved facility. The management and disposal location of the waste will depend on the type of waste material. Typical construction waste includes hydrocarbons, fuels and solvents, oil filters, absorbent materials, ozone-depleting substances, domestic sewage, off-cuts of construction materials (metal, wood, and concrete), and packaging associated with materials (e.g., plastic and paper). Wastes will be segregated at source by material type and then stored and managed in a manner appropriate to the material type before being picked up by an approved waste management company.

Air emissions are expected from diesel- and gasoline-powered construction equipment and will be mitigated through proper maintenance of equipment and operating procedures. Dust control measures, such as applying water spray to avoid dust mobilization and re-seeding of disturbed areas, will be implemented as necessary to control dust from construction activities. An Erosion and Sediment Control Plan will be developed and implemented to control sedimentation and direct runoff to appropriate discharge locations.

Should driven piles be specified by the geotechnical engineer to support foundations for the grinding plant, that process will generate noise and vibrations. Ground compaction and stabilization will also generate noise and vibrations. Otherwise, noise sources during construction will be limited to the operation of stationary and mobile construction equipment, including back-up warning horns.

During construction of Stage 2, all land-based emissions are anticipated to be the same as those during Stage 1. The main difference during Stage 2 will be the requirement for dredging in preparation for marine construction. Based on the preliminary design, a conservative estimate of 8,000 m^3 of dredgeate will be removed and require disposal. The volume of dredgeate is expected to decrease through design optimization and the availability of updated data on riverbed bathymetry. It is anticipated that the dredgeate will be managed as part of current Fraser River maintenance dredging works, and be disposed of through beneficial reuse as a construction material, or at a Disposal at Sea Location certified by Environment Canada under a Disposal at Sea Permit. This work is currently carried out by Fraser River Pile and Dredge, under a 10-year contract with the VFPA that expires in 2021. Construction wastes associated with Stage 2 will be similar to those of Stage 1 and will be managed in the same manner as in Stage 1. Noise and vibrations will be generated during installation of piles during marine terminal construction. Light emissions associated with construction will be limited to mobile lighting units, which typically are powered by a diesel generator.

2.7.2 Operation

During operation, emissions will be released to the air from mobile and stationary sources associated with material delivery, handling, and processing. Noise and fugitive light will also be generated.

Marine sources of emissions will include vessels used to deliver raw material to the Facility, and to take finished product to various markets. Those sources include ocean-going vessels in transit and hotelling, and tug boats that will

escort larger vessels and assist with delivery of raw products by barge. Marine sources of emissions use Marine Gas Oil (MGO) and diesel fuel, and release particulates (e.g., particulate matter that is 10 micrometres (µm) or less in diameter [PM_{10}], particulate matter that is 2.5 µm or less in diameter [$PM_{2.5}$], and diesel particulate matter [DPM], the aggregate sometimes expressed as Total Suspended Particulates [TSP]), sulphur dioxide (SO_2), nitrogen oxides of various species (NO_X), carbon monoxide (CO), and volatile organic compounds (VOCs) as combustion by-products.

Trucks will also be used to deliver raw material and to, and handle material at the Facility, and to deliver SCM to various markets. Trucks use diesel fuel and release particulates (e.g., PM_{10}, $PM_{2.5}$, and DPM), SO_2, NO_X, CO and VOCs as combustion by-products.

Conveyors and cranes may also be used for handling materials. Though conveyors and cranes are normally electric and do not produce combustion by-products, materials handling has the potential to generate and entrain dust (PM_{10} and $PM_{2.5}$) in the ambient air. The concentration of entrained material depends on the dust content and moisture content in the material being handled, and on the handling methods.

Materials will be stockpiled outside in open (uncovered) areas of the Site and will not be indoors. Stockpiles have little potential to generate dust, as the non-toxic material is dense and stable and does not readily become air-borne. A small amount of dust (PM_{10} and $PM_{2.5}$) may be mobilized by air currents. The amount of material depends on the dust and moisture content in the material being handled, and on the handling methods associated with managing the stockpiles.

Raw material will arrive in a coarse form and be reduced in size by the grinding plant, before being blended with other material as needed. Grinding can generate significant levels of particulates (PM_{10} and $PM_{2.5}$) that will be controlled by a dust-collection system before the airstream is released to the environment. Once ground, the material will be stored in silos equipped with vents reducing the potential to generate particulate emissions (PM_{10} and $PM_{2.5}$).

Other potential emissions will originate from building and process heating requirements, and from smaller sources including on-site support vehicles.

The predominant noise sources during operation will be the grinding facility, docking and loading of vessels, and maintenance dredging activities (if required). Noise will also be generated from the day-to-day running of the Site, which includes trucks and staff members' vehicles entering and exiting the Facility.

Sources of light emissions will be mainly limited to fixed on-site lighting, navigational lighting, and lighting associated with the marine terminal. Mobile lighting units may be used during periods of maintenance or in the event of a power failure. These units are typically powered by diesel generators.

In addition to emissions to the atmosphere, the project will generate various solid and liquid wastes. These include sanitary sewage, domestic and office waste (e.g., paper, food waste), and small quantities of hazardous materials, associated with the operation and maintenance activities such as batteries, lubricants, solvents, oily rags and oil. Wastes will be segregated at source and stored and managed as appropriate to the waste type prior to disposal. Sanitary sewage will be tied into to the City of Delta sewage system. A stormwater management system will be constructed to collect and convey rainwater runoff from the Site. The stormwater management system will tie into the City of Delta storm-sewer system and include engineering and operational controls as required.

2.7.3 Accidents and Malfunctions

During construction and operation, there is the potential for accidents and malfunctions to occur. An accident is an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury. A malfunction is an equipment or systems failure. Potential accidents and malfunctions include:

- Spills and leaks of fuel or other hydrocarbon liquids from mobile and stationary equipment
- Shipping collisions with other vessels or with marine infrastructure, and grounding
- Ground motor vehicle accidents

Fires and explosions at the grinding plant or marine berth, unanticipated air emissions and discharges to land and water may result from accidents and malfunctions. As there are no hazardous materials associated with the SCM

manufacturing process, any discharges resulting from accidents or malfunctions will consist of loss of raw materials (e.g., limestone, gypsum, GGBS), loss of product (SCM), hydrocarbon spills, and any air emissions that could result from combustion of infrastructure. Some accidents and malfunctions such as fire and explosion, vessel collisions or motor vehicle accidents also have potential to result in personal injury.

Lehigh Hanson Materials Limited will establish procedures for preventing and handling accidents and malfunctions during construction, operation, and decommissioning. Potential accidents related to shipping activities will be addressed in cooperation with the Canadian Coast Guard and the VFPA. Protocols will be in place for addressing fires and explosions, which are considered unlikely, and any air emissions would be short-term.

3. Project Location and Mapping

3.1 Project Location and Coordinates

The Site is located along the Fraser River, on Tilbury Island, Delta, BC. The Facility will cover an area totalling approximately 8.85 ha (8 ha of terrestrial area and 0.85 ha of water) immediately to the east of the existing Delta Cement Plant.

The coordinates at the centre of the Site are: 49°08'40.2°N and 123°01'10.7°W

The Site was selected as it is on an accessible waterway, on lands owned by Lehigh Hanson Materials Limited and adjacent to existing infrastructure owned and operated by Lehigh Hanson Materials Limited.

Tilbury Island is a highly developed industrial area, with approximately 80% of the land used for industrial activities, including the existing Delta Cement Plant, the FortisBC Tilbury LNG Plant, Dynacor Coatings Ltd., and several manufacturing and retail businesses, including those in the Tilbury Island Industrial Park that is nearing full build-out.

The Project will be located east of the existing Delta Cement Plant, on an area currently used as farmland, immediately to the east of the Project is an area of industrial and retail operations currently under construction. The Site is not within the provincial Agricultural Land Reserve (ALR). Farther afield, areas surrounding Tilbury Island are a mix of industrial, farming, and recreational lands. The Site is approximately 20 km upstream of the mouth of the Fraser River.

3.2 Land and Water

The onshore component of the Project will be constructed on lands owned by Lehigh Hanson Materials Limited. The offshore component of the Project (i.e., the marine terminal as part of Stage 2) will be constructed in water classified as provincial Crown Land that falls under the administration of FLNRORD. A Crown Licence of Occupation Water Lot Lease will be required for that component of the work and operations.

The marine terminal, which is part of the Delta Cement Plant, is owned and operated by Lehigh Hanson Materials Limited within an existing Water Lot Lease. The VFPA has jurisdiction of the navigation of water in and around the Project, and extending west beyond Roberts Bank. Figure 3-1 depicts the extent of the VFPA jurisdiction.

3.3 Zoning Designations

The Site is zoned by the City of Delta as I2: Heavy Industrial. This designation enables all uses permitted in the I1 – Light Industrial Zone and the operation of manufacturing and processing industries, but excludes cement and asphalt production. Accordingly, the Site will need to be rezoned to I7: Special Industrial, which allows for manufacturing, processing, finishing, and storage of cement.

This zoning re-designation would also correspond with the zoning designation of the existing Delta Cement Plant, which is currently zoned as I7 (Parcel Identifier Number 029-657-385). The current zoning of the land surrounding the Project is depicted in Figure 3-2.

The City of Delta's Official Community Plan (OCP) underwent consultation with governmental agencies, stakeholders, and Indigenous groups during its development. The planned re-zoning of the areas from I2 to I7 is in keeping with the City of Delta's future land use plan to use the land as Riverside Industrial (RI).

3.4 Neighbouring Communities

The nearest residential dwelling appears to be approximately 1.1 km south of the Site, opposite River Road. The Project is located approximately 5 km from the centre of the City of Delta, 10 km from the centre of the City of Richmond, 7 km from the highly industrialized Annacis Island (partly within the City of Delta and partly within the City of New Westminster), and 20 km upstream from the mouth of the Fraser River (Figure 3-2).

Basemapping from Bing, GeoBC and AECOM 2018.

Legend

- Project Location
- Vancouver Fraser Port Authority Managed Federal Lands and Waters
- Vancouver Fraser Port Authority Navigational Jurisdiction

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1:150,000

NAD 1983 UTM Zone 10N

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group

Location: Tilbury Island, Delta, BC

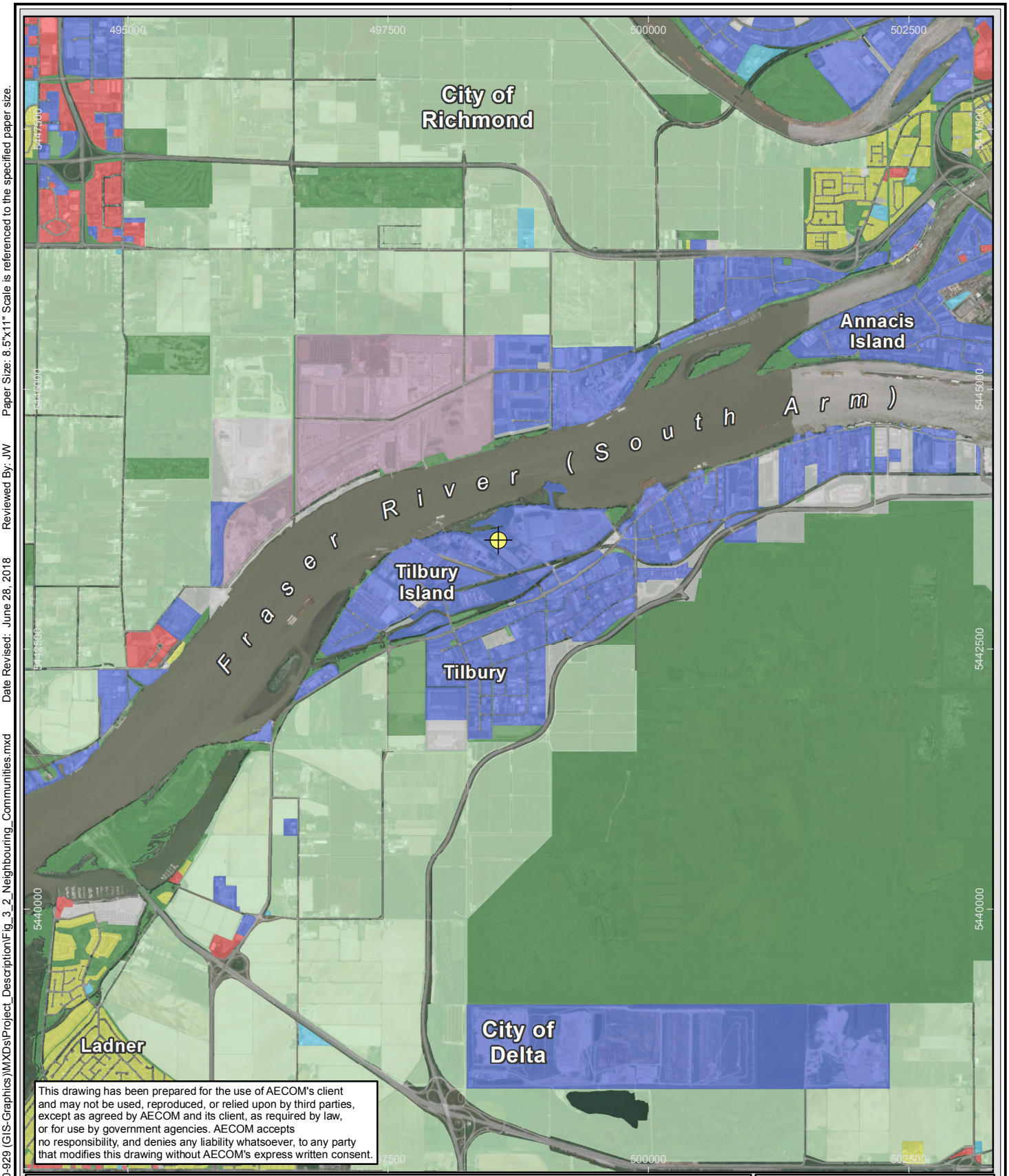
Vancouver Fraser Port Authority Jurisidiction

June 2018

AECOM

Figure 3-1

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\MXDs\Project_Description\Fig_3_1_VFPA_Jurisdiction.mxd Date Revised: June 27, 2018 Reviewed By: JW Paper Size: 8.5"x11" Scale is referenced to the specified paper size.



Basemapping from Bing, GeoBC and AECOM 2018.

Legend

- Project Location
- Residential
- Commercial
- Industrial
- Institutional
- Port Metro Vancouver
- Agriculture
- Recreation, Open Space and Protected Natural Areas
- Undeveloped and Unclassified

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NAD 1983 UTM Zone 10N

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group

Location: Tilbury Island, Delta, BC

Surrounding Land Use & Neighbouring Communities

June 2018

AECOM

Figure 3-2

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\MXDs\Project_Description\Fig_3_2_Neighbouring_Communities.mxd Date Revised: June 28, 2018 Reviewed By: JW Paper Size: 8.5"x11" Scale is referenced to the specified paper size.

3.5 Indigenous Groups

Table 3-1 lists Indigenous groups with established or asserted traditional territories that overlap with, or are in close proximity to, the Project Site. This list is based on the publically available information from Indigenous groups, the Statement of Intent maps available through the B.C. Treaty Commission, and from the public version of the Consultative Areas Database maintained by the Province of British Columbia. Figure 3-3 depicts the location of the reserves of Indigenous groups listed in Table 3-1. Boundaries of traditional territories may be subject to refinement, based on consultation with Indigenous groups.

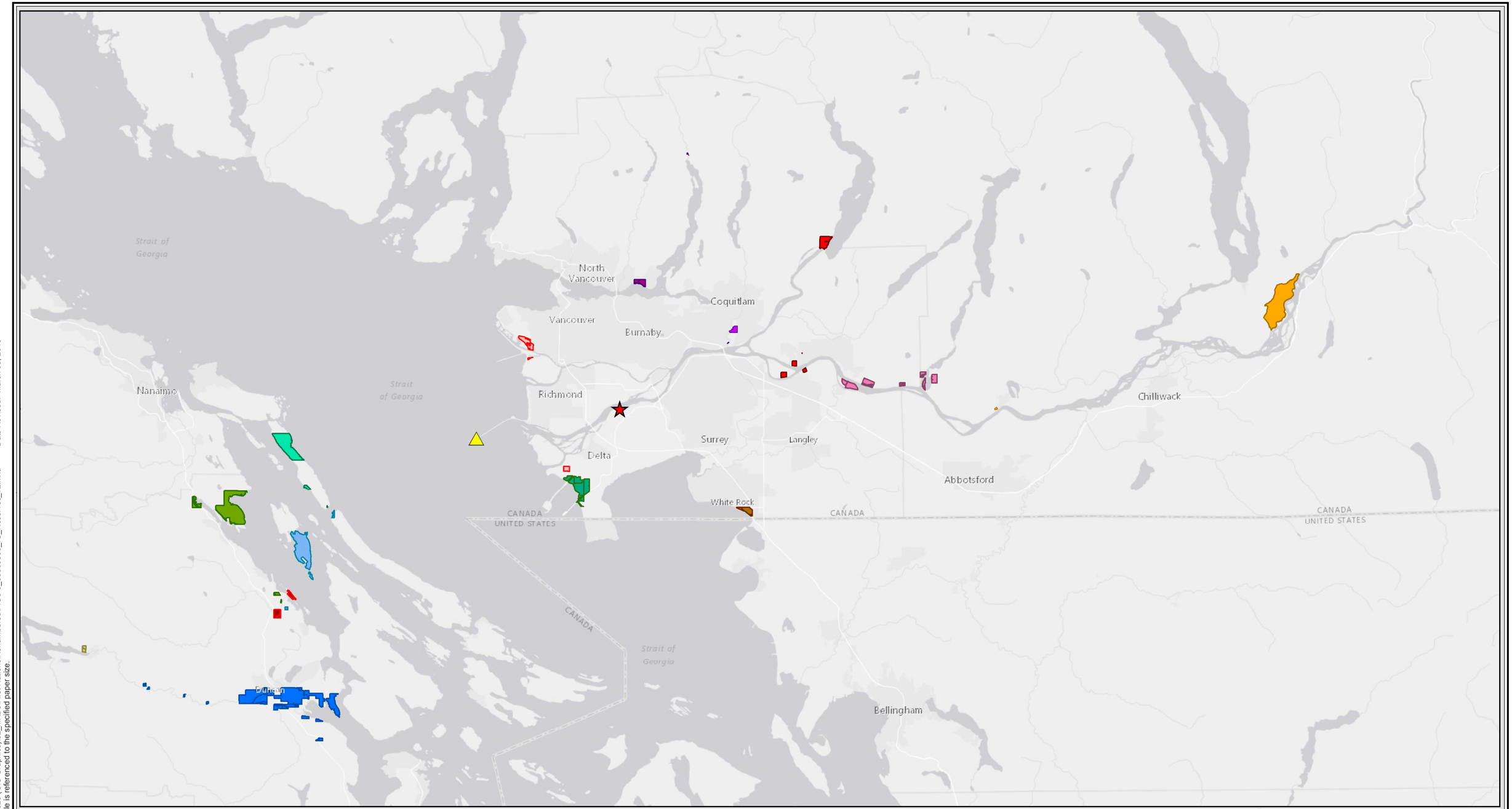
Table 3-1 Indigenous Groups in order of Closest Distance to the Project Site

Indigenous Group	Location	Approximate Distance from the Site[1]
Musqueam Indian Band	The main Musqueam community is located at the mouth of the North Arm of the Fraser River, within the limits of the City of Vancouver.	10 km (Reserve)
Tsawwassen First Nation	The main Tsawwassen community is on the southern point of the Fraser River delta, on the west side of the peninsula that separates Boundary Bay from the Strait of Georgia.	12 km (Treaty Lands)
Tsleil-Waututh Nation	The main Tsleil-Waututh community is located in North Vancouver, approximately 2 km east of the north end of the Second Narrows Bridge, on Burrard Inlet 3.	19 km (Reserve)
Kwikwetlem First Nation	The Kwikwetlem First Nation's two reserves are located in Coquitlam.	19 km (Reserve)
Semiahmoo First Nation	Semiahmoo has one reserve, fronting Semiahmoo Bay (part of Boundary Bay) at the Canada-United States border, about 1 km southeast of White Rock.	24 km (Reserve)
Katzie First Nation	The main Katzie communities are located in Pitt Meadows (Katzie 1), in Langley (Katzie 2), and on Barnston Island (Katzie 3).	27 km (Reserve)
Kwantlen First Nation	Kwantlen First Nation administrative office is located on McMillan Island (also the location of Reserve #6) and has administration over 6 different Reserves along the Stave River and Fraser River, and in the District of Mission	35 km (Office)
Lyackson First Nation*	The main Lyackson community is located on Vancouver Island, in Chemainus.	46 km (Reserve)
Penelakut Tribe*+	The main Penelakut community is located on Kuper Island off the east shore of Vancouver Island, near Chemainus.	48 km (Reserve)
Halalt First Nation *+	The main Halalt community is located on Vancouver Island in the community of Chemainus. Halalt First Nation IR2 is located 10 km south of the town of Chemainus on Vancouver Island. Halalt First Nation IR1, Willy's Island, is located at the mouth of the Chemainus Estuary near the town of Crofton. The traditional village site of Tl'uqtinus is located on the north shore of the South Arm of the Fraser River, directly opposite the project location.	53 km (Reserve)
Stz'uminus First Nation*+	The main Stz'uminus community is located on Vancouver Island in Chemainus.	54 km (Reserve)
Cowichan Tribes*+	The main Cowichan reserve is located on Vancouver Island in the community of Duncan and at Cowichan Bay.	61 km (Reserve)
Lake Cowichan First Nation*	The main Lake Cowichan community is located on Vancouver Island, on the east end of Lake Cowichan approximately 30 km west of the community of Duncan.	83.3 km (Reserve)
Seabird Island Band	The Seabird Island Band Office is located on Seabird Island just east of Aggasiz on the Fraser River.	95 km (Band Office)
Métis Nation British Columbia	Métis Nation British Columbia is not part of the reserve system, but has six chartered communities in the lower mainland region: North Fraser Métis Association (located in New Westminster), Nova Métis Heritage Association (located in Surrey), Waceya Métis Society, Golden Ears Métis Society (located in Maple Ridge), Fraser Valley Métis Association (located in Chilliwack), and Chilliwack Métis Association (located in Chilliwack), and three on south Vancouver Island.	

1. (Reserves, Communities, or Chartered Communities)

**These First Nations are members of the Hul'q'umi'num' Treaty Group. Hul'q'umi'num' assert a collective core (title) territory that includes the lower Fraser River, including the area of the Project.*

+ These First Nations are members of the Cowichan Nation Alliance. The Cowichan Nation Alliance is collective of First Nations who represent their members in title and rights negotiations.



Basemapping from Esri World Light Gray;
First Nation Layers from GeoBC

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Legend

- Project Location
- Sands Head Lighthouse

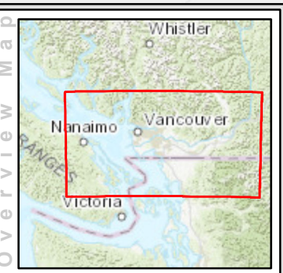
RESERVES OF INDIGENOUS GROUPS

COWICHAN NATION ALLIANCE

- Cowichan Tribes
- Halalt First Nation
- Penelakut Tribe
- Stz'umnius First Nation

- KATZIE FIRST NATION
- KWANTLEN FIRST NATION
- KWIKWETLEM FIRST NATION
- LAKE COWICHAN FIRST NATION
- LYACKSON FIRST NATION
- MUSQUEAM INDIAN BAND
- SEMIAHMOO FIRST NATION
- SEABIRD ISLAND BAND
- TSAWWASSEN FIRST NATION LANDS
- TSLEIL-WAUTUTH NATION

Overview Map



Lehigh Hanson
HEIDELBERGCEMENT Group
Location: Tilbury Island, Delta, BC

Reserves of Indigenous Groups

December 2018

AECOM

Figure 3-3

File Location: P:\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\02_MXDs\First Nations\Renumbered\FIG3-3_60560505_IG_Reserves_v2.mxd
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Date Revised: March 05, 2019

5. Potential Effects on the Natural Environment

Information in this section is preliminary, and based on desktop studies and technical investigations conducted to date. The EA will provide a thorough analysis of potential effects of the Project, and fully consider and incorporate Indigenous Knowledge (IK) together with empirical science. Lehigh Hanson Materials Limited looks forward to working with Indigenous groups, and understands that IK includes both traditional and current knowledge.

5.1 Climate

The Project has the potential to release greenhouse gases during the construction, operation and decommissioning. An evaluation will be conducted to assess the magnitude of those releases and develop strategies to mitigate effects, where practical. Greenhouse gases to be considered in the assessment are those that result from SCM manufacturing, material handling, and the movement of materials by truck and marine vessels. There is potential for two greenhouse gases to be generated and released to the environment during these activities: carbon dioxide (CO_2) and nitrous oxide (N_2O).

The greenhouse gas assessment will include estimating the potential magnitude of these releases, and developing mitigation measures to reduce the generation and release of these pollutants by equipment or operational changes.

5.1.1 Atmospheric Conditions

Existing ambient air quality includes pollution from both human and natural sources (e.g., fire), and from both nearby and unidentified distant sources. Land use around the Site is dominated by marine, urban and industrial activities. Commercial shipping on the South Arm of the Fraser River, ship loading and unloading at nearby terminals, road traffic, and industrial activities on adjacent properties contribute to the existing air quality and the acoustic environment.

Air contaminants such as particulate matter (i.e., $PM_{2.5}$ and PM_{10}) are emitted from existing industrial activities, shipping traffic and road traffic and have the potential to affect receptors.

The Project is located in a primarily industrial area, the closest residence is approximately 1.1 km south of the Site. Sensitive receptors identified near the Project are listed in Table 5-1.

Table 5-1 Sensitive Receptors near the Site

Receptor Type	Name or Description	Approximate Distance from the Site(km)
Residence	68 St. and River Rd.	1.1
Senior Care Facility	Diversicare Canada Management Services Co., Inc.	4.7
School	Neilson Grove Elementary	5.74
Child Care Facility	Animal Crackers Day Care	6.4

Background (ambient) air quality data for the pollutants of concern are measured at a number of monitoring locations across Metro Vancouver. Generally, ambient air concentrations of monitored pollutants are below the corresponding level specified in *Metro Vancouver's Ambient Air Quality Objectives* (MVAAQO; Metro Vancouver 2016). The nearest Metro Vancouver air quality monitoring stations are T17 (Richmond South) and T31 (Vancouver Airport). These stations both measure $PM_{2.5}$, sulphur dioxide (SO_2), carbon monoxide (CO) and nitrogen dioxide (NO_2) and ozone (O_3) on a continuous basis. Stations T31 (Vancouver Airport) and T18 (Burnaby South) both measure PM_{10} on a continuous basis.

Industrial facilities may only discharge air contaminants in accordance with the terms and conditions of a permit or emission regulation, according to the GVRD Air Quality Management Bylaw 1082, 2008. The Project operations that could affect air quality include: road and marine traffic, use of mobile equipment and process equipment on Site. The air quality assessment for the Project will assess the magnitude of those effects and develop strategies to mitigate those effects where practical. Contaminants to be considered in the air quality assessment are the result of grinding, material

storage and handling, and the movement of materials by truck, rail, and marine vessel. There is potential for the following pollutants to be generated during these activities and released to the environment:

- Nitrogen Oxides
- Sulphur Oxides
- Carbon Monoxide
- Particulate matter 10 micrometres or less in diameter (PM_{10})
- Particulate matter 2.5 micrometres or less in diameter ($PM_{2.5}$)
- Diesel Particulate Matter
- Volatile Organic Compounds

The air quality assessment will determine the magnitude of any such releases and their expected maximum ground-level concentration within a pre-determined study area, and develop mitigation measures to reduce the generation and release of these pollutants by equipment or operational changes.

5.1.2 Acoustic Environment

The City of Delta Noise Bylaw No. 1906 restricts specific sources of noise during different times of day to prevent noise from causing nuisance to nearby receptors, such as those stated in Table 5-1. The Project has the potential to generate unwanted noise during the construction and operational phases. Noise generating activities include, material grinding, material handling and storage, and the movement of bulk materials by truck, rail, and marine vessels. The objective of the noise assessment will be to assess the magnitude of those effects and develop strategies to mitigate those effects where practical.

The noise assessment will determine the magnitude of potential noise-generating activities and equipment and their expected effects on sensitive receptors. Once acoustic effects on sensitive receptors are understood, appropriate mitigation measures will be developed and best practices will be reviewed, aimed at reducing the effects of noise-generating activities and equipment.

5.2 River Hydraulics and Morphology

Tilbury Island is located along the south shore of the South Arm of the Fraser River, which conveys 87% of the total flow of the Fraser River (DFO 2014). Flows in the Fraser River are driven primarily by spring freshet, which causes a fluctuation from the lower winter flows of 300 m^3s^{-1} to a maximum of 10,000 m^3s^{-1} during spring freshet flows in June. The annual freshet event, fed by melting snow in the surrounding mountain ranges, also conveys a large volume of sediment that settles out at various stages along the river, depending on particle size. According to FREMP and BIEAP (2006), 70% of the sediment generated during freshets is deposited along the river, while 30% of the sediment travels to the Pacific Ocean as far as Sand Head. The riverbed along Tilbury Island is expected to be a reflection of the distinct flow patterns: the high energy outer bend of the river consists of sand and coarser materials, while the inside bend, with lower flow, consists primarily of finer substrates (FREMP and BIEAP 2006).

Deposition of freshet-derived sediment is the driver for the annual dredging program that the VFPA conducts in the Fraser River, the aim of which is to maintain the navigation channel in the South Arm and enable safe movement of vessels along the river.

Stage 2 of the Project may alter a number of aspects of river hydraulics and morphology, including flow patterns and water velocities, and may have a local impact on erosion and sediment deposition patterns. The Project will aim, through the use of three-dimensional (3D) Morphodynamic Modelling, to determine the significance of any such changes and how they can be mitigated (e.g., alternation in design and location of piles).

This portion of the Fraser River is tidally influenced by the salt water wedge from the Pacific Ocean. During lower, winter-flow conditions, the salt water wedge flows upstream of the Site as far as Annacis Island, while during the larger, summer freshet flows, the salt water wedge extends to approximately the mid-point of Deas Island, downstream of the

Site (FREMP and BIEAP 2006). During a tidal cycle, the salt water wedge moves along the river bottom while the lower-density freshwater overlies the saltwater layer. Accordingly, the salinity concentration of the Fraser River at Tilbury Island varies over a tidal cycle and is also dependent on the influence of the freshet.

5.3 Aquatic Ecosystems

5.3.1 Setting

Fish Habitat

While Tilbury Island is dominated by industrial activity, the riparian area surrounding the island is a mix of intertidal marsh and woodland dominated by deciduous trees (FREMP 2016)[8]. Intertidal marine vegetation that would be expected to grow in the marsh condition around Tilbury Island is minimal to absent (FREMP 2015). This combination of habitats continues both upstream and downstream of Tilbury Island, with an increase in intertidal marsh present downstream toward the Fraser River estuary. Marine plants, including rockweed (*Fucus* spp.), sea lettuce (*Ulva* spp.), bull kelp (*Nereocystis luetkeana*), and eelgrass (*Zostera marina*), grow beyond the mouth of the Fraser River, approximately 20 km from the Site.

The shoreline of Tilbury Island has been classified as high-productivity habitat, as defined by FREMP (2015), with smaller portions of moderate-to-low productivity habitat also having been delineated. FREMP (2015) defined this high productivity habitat to:

> *"…. include productive and diverse habitat features that support critical fish and wildlife functions on-site or as part of a more regional context and/or areas where habitat compensation has been previously constructed to offset habitat losses…. ".*

There are several sites of previous habitat compensation in close proximity to the Site that may be influenced by hydrological changes to the river arising from Stage 2 of the Project. These habitat compensation sites are illustrated below in Figure 5-1.

Within the terrestrial portion of the Site are several ditches. Based on a preliminary Site assessment carried out by AECOM, the ditches likely offer poor rearing and overwintering salmonid habitat. Although vegetated fish cover appears abundant overall and water levels were sufficient to support fish in places, habitat complexity is low and there was little-to-no flow. The habitat is unsuitable for spawning and incubation as only fine substrates were present and suitable spawning gravels were absent. Furthermore, water temperatures during the May 2018 Site assessment were sub-optimal for all salmonid life history stages, and there is uncertainty about the potential connectivity of the Site ditches with Tilbury Slough.

In assessing potential serious harm to fish under the provisions of the Fisheries Act, a variety of factors will be considered, including the availability and condition of existing nearby fish habitat. Therefore, this assessment will be conducted with the perspective of the current state of the ecosystem (i.e., pre-existing impacts included).

Fish Species

The Fraser River system[9] is home to a rich diversity of fish, with 53 species in total, of which 43 are considered native to BC (McPhail and Carveth 1993). The majority of populations of introduced species reside in the lower reaches of the Fraser River. The fish species of the Fraser River support a commercial, recreational and aboriginal fishery throughout the river's system including the areas adjacent to the Project.

Key fish species known to inhabit the Fraser River, and that will be included in the effects assessment, include white sturgeon (*Acipenser transmontanus*), eulachon (*Thaleichthys pacificus*), all five species of Pacific salmon (*Oncorhynchus* spp.), the anadromous rainbow trout (*O. mykiss*), and coastal cutthroat trout (*O. clarki clarki*).

[8] While the FREMP has been discontinued, the data sets produced during its operation are considered to be the gold standard of ecological understanding of the Fraser River and are regularly used to inform federal and provincial decision making and effects assessments.
[9] The Fraser River system figures quoted include contribution from the Nooksack and Skagit rivers.

All five species of Pacific salmon (*Oncorhynchus* spp.), the anadromous rainbow trout (*O. mykiss*), and coastal cutthroat trout (*O. clarki clarki*) inhabit the Fraser River. Salmonids occupy the lower Fraser during their upstream migration to spawning grounds and during their downstream, outward migration as juveniles. Rearing of juvenile salmon also takes place along the freshwater and brackish reaches of the Fraser River prior to seaward migration.

The Fraser River is also home to the Green sturgeon (*Acipenser medirostris*), a species listed as being of "Special Concern" under the *Species at Risk Act* (SARA).

The fish species inhabiting the Site ditches were identified during May 2018 field assessments, through minnow trapping and electrofishing. At that time, only two species were caught: three-spined stickleback (*Gasterosteus aculeatus*), a widespread species native to BC, and pumpkinseed sunfish (*Lepomis gibbosus*), an introduced species originally from central and eastern parts of North America.

Invertebrate Community

Owing to the soft sediment mudflats and marsh habitat, benthic communities in the Fraser River surrounding Tilbury Island are expected to be dominated by burrowing species with a preference for this type of habitat, for example, Oligochaetes (Stronach 1995).

5.3.2 Potential Effects and Mitigation Measures – Aquatic Ecosystems

Construction of the marine terminal in Stage 2 will require in-water activities, and may result in serious harm to fish (as defined by the *Fisheries Act*) that may necessitate an FAA and the requirement for offsetting. This effect may be realized during both construction and operation (if maintenance dredging is required), and include: change in water and sediment quality, loss of benthic invertebrate communities, degradation of habitat as a result of an alternation in river processes, noise and lighting effects from construction and operation, and direct mortality resulting from marine terminal infrastructure and maintenance dredging.

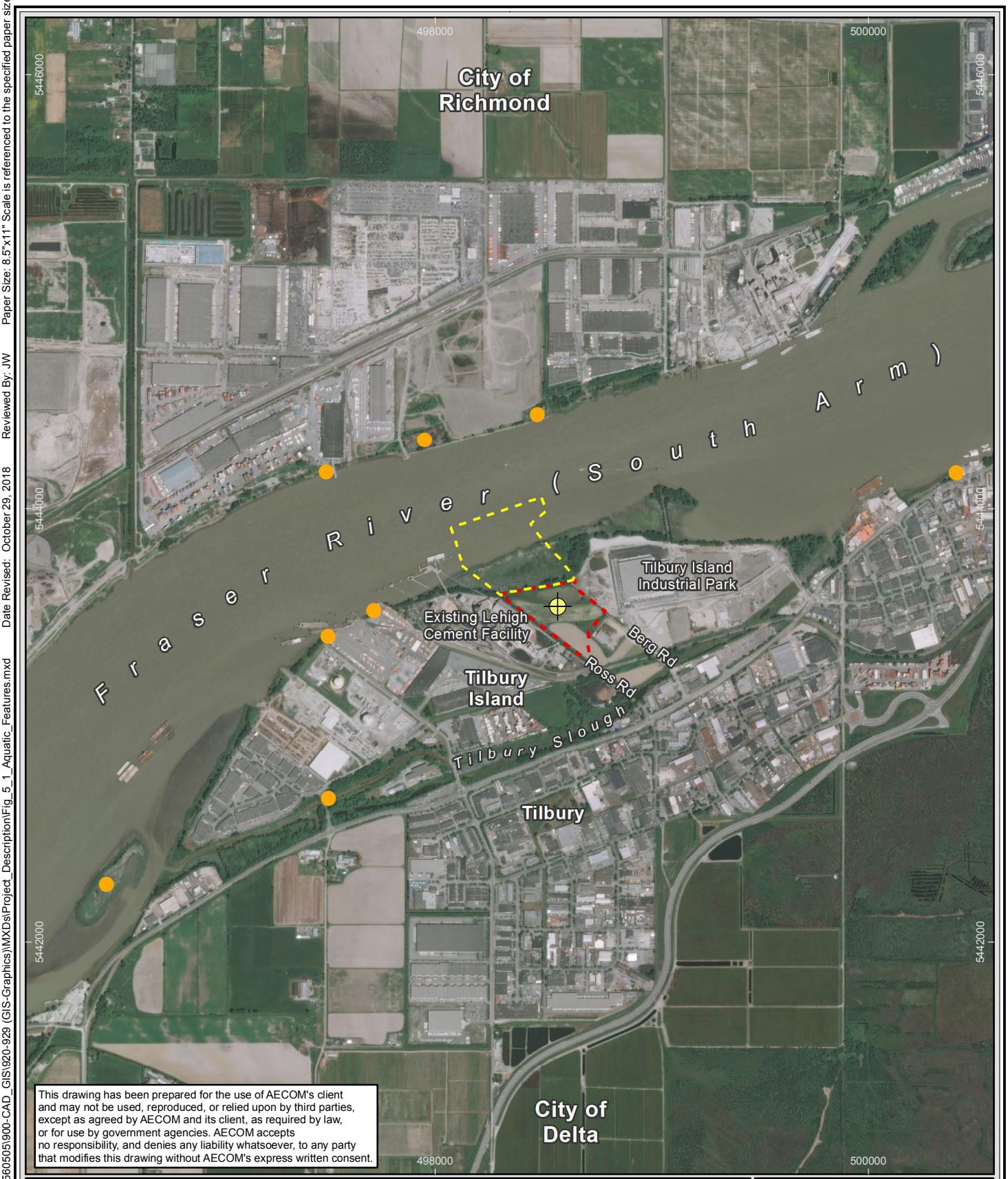
Notwithstanding potential effects, actual effects are likely to be small in magnitude. The physical footprint of the marine terminal and conveyor belt systems will be small, as they will be constructed on piles, thereby limiting their footprint, both in the water and on-shore. Furthermore, areas surrounding the proposed marine terminal are regularly dredged as part of the annual VFPA Fraser River dredge program.

A site-specific environmental management plan will be developed, aimed at reducing the potential effects on freshwater fish, and will likely be combined with the estuarine-marine management plan discussed in the following section. Mitigation measures may include:

- The timing of works to avoid sensitive life stages and ensure compliance with DFO's least-risk timing window (LRTW) from June 16 to February 28
- Design modifications where possible (e.g., incorporation of grating into the Stage 2 marine terminal to enable natural light to penetrate)
- Best management practices (BMPs) (e.g., appropriate setbacks from fish-bearing streams, and effective erosion and sediment control to protect water quality)
- Use of silt curtains to minimize the release of sediment, and bubble curtains to reduce mechanical effects on fish
- Adoption of vibratory pile methodology to reduce the potential underwater acoustic effect and/or the use of pile cushion for impact hammering

Work conducted outside of a DFO or provincial LRTW may require additional and appropriate mitigation (e.g. fish salvage, fish exclusion) to reduce the risk to an acceptable level. Work timing will be discussed with Indigenous groups and other users of fisheries resources. In accordance with DFO policy, work will be timed not only in relation to the LRTW, but also to protect fish, including their eggs, juveniles, spawning adults, and the organisms upon which they feed.

Should offsetting of serious harm be required, an offsetting plan will be developed that meets the specific requirements of an FAA. The plan would include measures to avoid any effects on ongoing offsetting or restoration projects, and may include opportunities for synergy with other projects.



Basemapping from Bing, DataBC FREMP and AECOM 2018.

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Legend

- Project Location
- FREMP Habitat Compensation Site

Approximate Boundary of Project

- Stage 1
- Stage 2

Overview Map

Location: Tilbury Island, Delta, BC

FREMP Habitat Compensation Sites in Proximity to the Project

October 2018

AECOM

Figure 5-1

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, ©

File Location: \\cabny1fp001\prod\Projects\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\MXDs\Project_Description\Fig_5_1_Aquatic_Features.mxd Date Revised: October 29, 2018 Reviewed By: JW Paper Size: 8.5"x11" Scale is referenced to the specified paper size.

5.4 Marine Ecosystems

5.4.1 Setting

While the South Arm of the Fraser River is influenced by saltwater, the Project is not considered to be taking place in a marine environment. There is, however, the potential for marine mammal species to be present in close proximity to Tilbury Island, specifically harbour seal (*Phoca vitulina*) and sea lion (*Zalophus californianus*). Other marine mammals associated with the Strait of Georgia, almost 20 km away (e.g., whales and dolphins), are highly unlikely to move so far upstream.

Shipping associated with Stage 1 of the project will increase the number of vessels sailing to Plumper Sound to lighter the GBFS onto barges. Shipping associated with Stage 2 of the Project will increase the number of vessels to Tilbury Island. This increase in vessel traffic has the potential to interact with several SARA-listed species (Table 5-2).The area surrounding the mouth of the Fraser River forms part of the critical habitat of the Southern Resident population of the Killer Whale (*Orcinus orca*).

Table 5-2 Marine Mammals of the Strait of Georgia

Species	SARA Status	Expected Seasonal Occurrence in the Strait of Georgia	Expected Seasonal Occurrence in the Fraser River
Southern Resident Killer Whale (*Orcinus orca*)	Endangered	Year round (most common late spring to early autumn)	None Expected
Transient Killer Whale (*Orcinus orca*)	Threatened	Year round	None Expected
Harbour Porpoise (*Phocoena phocoena*)	Threatened	Year round	Possible
Grey Whale (Eschrichtius robustus)	Special Concern	Spring through Fall	None Expected
Humpback Whale (*Megaptera novaeangliae*)	Special Concern	Spring through Fall (Winter sightings have recently occurred)	None Expected
Steller Sea Lion (*Eumetopias jubatus*)	Special Concern	Late Summer though Spring	Possible
California Sea Lion (*Zalophus californianus*)	Not at Risk	Year round	Year round
Harbour Seal (*Phoca vitulina*)	Not at Risk	Year round	Year round

Vessel routes will pass through the known range of the Southern Resident Killer Whale (SRKW), and in close proximity to a portion of its Critical Habitat. Vessel routes will also be close to several marine Wildlife Management Areas (WMAs) that have been established under Section 4 of the BC *Wildlife Act*. WMAs are designated for the benefit of regionally or internationally important species of wildlife and fish, and their habitats, through conservation and management. The SRKW Critical Habitat and WMAs associated with waters adjacent to the Fraser River delta are depicted in Figure 5-2.

WMAs in close proximity to the shipping lane are:

- Roberts Bank WMA
  - Marine species present include: all five species of Pacific salmon, white sturgeon, green sturgeon, steelhead, cutthroat trout, Pacific herring (*Clupea pallasii*), eulachon, flounders (e.g., starry flounder, *Platichthys stellatus*), and sculpins (e.g., *Cottus* spp.); marine mammals include killer whales, harbour seals and California sea lions (FLNRORD 2018).
- South Arm Marshes WMA
  - Marine species present include: juvenile spring, pink, chum, and coho salmon, which utilize the tidal marsh during their seaward migration (FLNRORD 2018).
- Sturgeon Bank WMA

- Marine species present include: all five species of Pacific salmon and at least 27 species of non-salmonid fish, including starry flounder, three-spined stickleback (*Gasterosteus aculeatus*), herring, and shiner perch (*Cymatogaster aggregata*) (FLNRORD 2018).

Potential effects on the marine environment as a result of the Project are related to an increase in noise generated through shipping and the construction of the vessel marine terminal and conveyor belt system. As a result of the Project, vessel traffic in the Strait of Georgia, Juan de Fuca Strait, and the Fraser River will increase. This increase in vessel traffic will result in louder underwater noise generated by running engines, vessel wake, and propeller wash, and has the potential to cause displacement or natural behaviour change in fish and marine mammals. Furthermore, increased vessel traffic may lead to a higher incidence of vessel strikes on marine mammals.

Construction of the marine terminal for Stage 2 may result in the generation of noise and vibrations that may affect marine mammals. The extent of in-water works will be refined through the design process.

Basemapping from Bing, GeoBC, Data BC Data Catalogue and AECOM 2018.

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NAD 1983 UTM Zone 10N

Legend

Project Location

Wildlife Management Areas

- Roberts Bank
- South Arm Marshes
- Sturgeon Bank

Critical Habitat for Souther Resident Killer Whales

- Transboundary Waters of Southern BC
- Transboundary Waters of Northern Washington

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group

Location: Tilbury Island, Delta, BC

Marine Features in Proximity to the Project

January 2019

AECOM

Figure 5-2

File Location: \\cabny1fp001\prod\Projects\60560505\900-CAD_GIS\920-929 (GIS-Graphics)\MXDs\Project_Description\Fig_5_2_WildlifeManagementAreas.mxd Date Revised: January 03, 2019 Reviewed By: JW Paper Size: 8.5"x11" Scale is referenced to the specified paper

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5.4.2 Potential Effects and Mitigation Measures – Marine Ecosystems

Mitigation measures that may reduce potential effects on the estuarine-marine ecosystem associated with the construction of the marine terminal and conveyor belt system include:

- Timing of works to avoid sensitive life stages and ensure compliance with DFO's least-risk work windows
- Use of silt curtains to avoid release of sediment, and bubble curtains to reduce the effect on marine mammals
- Adoption of vibratory pile methodology to reduce potential underwater acoustic effects, or use of pile cushions for impact hammering, or both methods
- Construction monitoring by a certified marine mammal observer where appropriate
- Adoption of the VFPA's Enhancing Cetacean Habitat and Observation Program (ECHO) for the movement of Vessels in Haro Strait

5.5 Terrestrial Ecosystems

5.5.1 Setting

The Site is located on industrial lands within the moist maritime (mm) subzone of the Coastal Douglas Fir (CDF) Biogeoclimatic Zone (iMap BC 2018). The CDFmm biogeoclimatic zone is defined by low elevations and having warm, dry summers and mild, wet winters (Nuszdorfer et al. 1991).

5.5.2 Vegetation

The onshore component of the Project will be built on land historically farmed that is flanked by ditches along the east and west borders of the Site. To the north, the Site is bounded by a dike separating it from the Fraser River. Owing to the farm use, vegetation within the onshore area of the Project is low in biodiversity, consisting mainly of a monoculture of potatoes. The ditches are vegetated by riparian species typical of the region, specifically willows, sedges, and horsetails. Also, because of past disturbance of the site, there is a very low probability of SARA-listed plant species being present. Rare plants will be included in the effects assessment.

Should Stage 2 go ahead, that part of the Project will span an area of marshy wetland, and riparian vegetation that consists of tall-shrub woodlands.

5.5.3 Wildlife

Amphibians and Reptiles

Both the terrestrial and riparian areas of the Project footprint may offer habitat for several amphibian and reptile species. The ditches may all provide habitat suitable for breeding, rearing, and feeding of amphibians and reptiles. Amphibians that may occupy portions of the Site include the Pacific chorus frog (*Pseudacris regilla*), northwestern salamander (*Ambystoma gracile*), long-toed salamander (*Ambystoma macrodactylum*), western red-backed salamander (*Plethodon vehiculum*), western toad (*Anaxyrus boreas*), red-legged frog (*Rana aurora*), Oregon spotted frog (*R. pretiosa*), and rough-skinned newt (*Taricha granulosa*). The western toad and the red-legged frog are blue-listed provincially, and designated as being of Special Concern federally.

Reptiles with the potential to inhabit the Site include the common gartersnake (*Thamnophis sirtalis*) and Northwestern gartersnake (*T. ordinoides*). The distribution of Western painted turtle (*Chrysemys pica*, Pacific Coast Population), which is provincially red listed, threatened by COSEWIC, and Endangered under Schedule 1 of SARA, includes the Site.

Mammals

The Site is potentially inhabited by a number of mammal species, including deer, raccoon, beaver, coyotes, shrews, rodents, and mustelids.

Shrews that may be present include the Pacific water shrew (*Sorex bendirii*) and the Olympic shrew (*S. rohweri*). The Pacific water shrew is a red-listed species provincially and considered Endangered federally under the SARA. The Olympic shrew is red-listed provincially and largely endemic to the Pacific Northwest of the USA; it is found only in three geographic areas: two in Washington State (USA) and one that is centered on Burns Bog in Delta, south of Tilbury Island.

Birds

The mudflats and estuarine conditions of the Fraser River are home to a wide variety of bird species that use these habitats for one or all of their life stages. In particular, many species of migratory birds potentially inhabit the Fraser River shoreline adjacent to the Project, and are protected under the federal *Migratory Birds Convention Act*. The Site is located within an Important Bird Area (IBA), the BC017: Boundary Bay–Roberts Bank–Sturgeon Bank (Fraser River Estuary) (IBA Canada 2018). Delineation of the IBA boundary may require updating, as the surrounding industrialized areas are not reflected on the map. IBA Canada (2018) identifies 50 species of shorebirds and describes the WMAs of Boundary Bay, Roberts Bank, and Sturgeon Bank collectively as “one of the richest and most important ecosystems for migrant and wintering waterbirds in Canada”. Furthermore, IBA Canada (2018) states that this IBA is home to globally or continentally significant populations of the following birds:

- American Wigeon (*Mareca americana*)
- Northern Pintail (*Anas acuta*)
- Mallard (*A. platyrhynchos*)
- Black Brant (*Branta bernicla nigricans*)
- Snow Goose (*Anser caerulescens*)
- Trumpeter Swan (*Cygnus buccinator*)
- Western Sandpiper (*Calidris mauri*)
- Black-bellied Plover (*Pluvialis squatarola*)
- Dunlin (*Calidris alpina*)
- Great Blue Heron (*Ardea herodias*)*
- Western Grebe (*Aechmophorus occidentalis*)
- Red-necked Grebe (*Podiceps grisegena*)
- Glaucous-winged Gull (*Larus glaucescens*)
- Thayer's Gull (*L. glaucoides thayeri*)
- Mew Gull (*L. canus*)
- Barn Owl (*Tyto alba*)*
- Peregrine Falcon (*Falco peregrinus*)*

** Denotes species of birds that are determined to be of Special Concern under SARA.*

The largest concentration of these species is in the WMAs noted above, and it is unlikely that members of many of the species frequent the terrestrial footprint of the Project, owing to heavily industrialized activities on Tilbury Island. The shoreline habitat of the Site (mudflats and riparian zone) may be used for foraging by some of these species; however habitat quality is diminished owing to the existing surrounding industrial activity and historic use of the area.

The Site is also located along the Pacific Flyway, a migratory corridor extending from Patagonia in the south to Alaska in the north. The IBA noted is a key location along this migratory route for feeding and resting. The area surrounding the Site is also designated as a Ramsar Site owing to the wetlands in the area having international importance. This Ramsar Site is known as Fraser River Delta Site No. 243, which is a combination of Burns Bog, Sturgeon Bank, South Arm Marshes, Boundary Bay, Serpentine, and the former “Alaksen” Ramsar Site.

5.5.4 Potential Effects and Mitigation Measures – Terrestrial Ecosystems

Potential effects on the terrestrial ecosystem as a result of the Project would consist of loss of habitat and direct mortality of plants and animals as a result of works. Construction of the Facility during Stage 1 will require placement of structural fill, grading and building construction of suitable foundations, and any loss of habitat would be considered permanent. Works associated with Stage 2 of the Project will have a smaller footprint occupying parts of the intertidal marsh and riparian area for the foundations of the conveyer belt system towers, but may fragment habitat for certain species.

The Project will also create noise and light that may affect the quality of the surrounding habitat from a sensory perspective, specifically the marsh along the Fraser River that constitutes a wildlife corridor. During the course of the EA, a site-specific environmental management plan will be developed and aimed, in part, at reducing the potential effects on the terrestrial ecosystem. Mitigation measures may include:

- Timing of works to avoid sensitive life stages, including bird nesting timing windows
- Construction monitoring and adaptive management
- Pre-construction surveys to confirm the absence of sensitive receptors

6. Potential Effects on Heritage Resources

6.1 Setting

Ethnographic literature documents heavy use of the banks of the Fraser River in pre-contact times by various Coast Salish peoples who inhabited the area and utilized the abundant resources available. These resources included berries of numerous varieties, black-tailed deer, elk, smaller fur-bearing mammals, fish, and waterfowl.

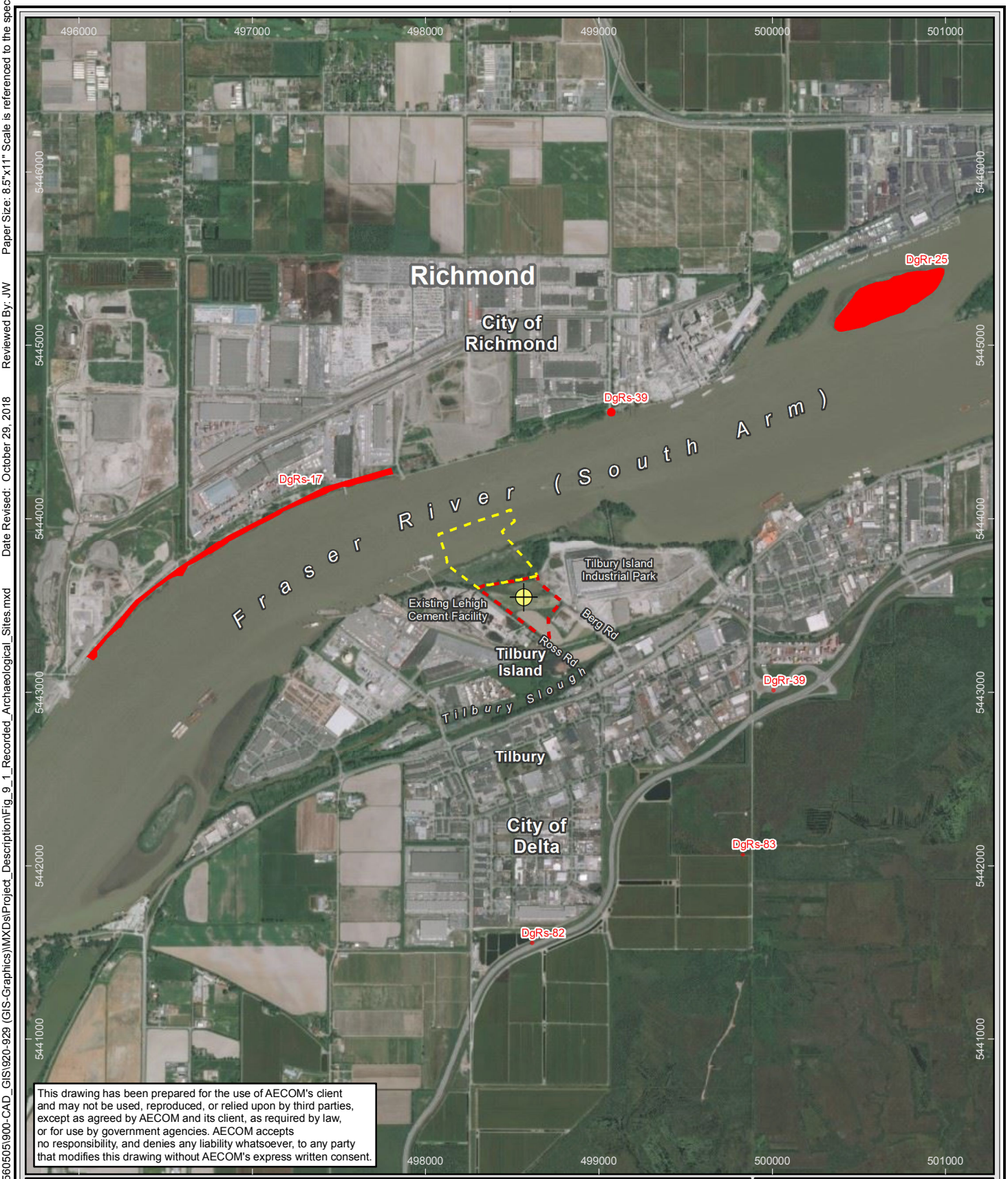
Archaeological sites previously recorded in the general study area range from large settlements with high-density lithic scatters and shell midden deposits, to small seasonal camps. Expected site types include: temporary and seasonal habitation sites, which leave remains such as hearths, features related to dwelling structures (e.g., plank house depressions and storage pits), artifact and lithic scatters, special-use campsites (e.g., menstrual huts, spirit or vision quest sites, and plant resource processing sites); and others, such as pictographs, petroglyphs, trails, burial areas, fishing locations, trap sets, and possibly forest utilization sites comprising Culturally Modified Trees (CMTs).

A search of the Provincial Heritage Registry Database (PHRD) at FLNRORD in Victoria revealed that no archaeological sites have been previously recorded within the Project footprint. The closest archaeological sites recorded nearby are: **DgRr-25**, **DgRr-39**, **DgRs-17, DgRs-39**, **DgRs-82**, and **DgRs-83.**

Locations of these sites, described below in numerical order, are depicted in Figure 6-1:

- Site **DgRs-17** consists of a fishing weir and lithic scatter area, located along the north bank of the Fraser River immediate opposite the Project footprint
- Site **DgRr-25** consists of a historic Japanese fishing site, with the potential to contain prehistoric items associated with longstanding Indigenous occupation of the area, located on an island in the Fraser River, northwest of the Project footprint
- Site **DgRr-39** consists of a shell-midden site, located on the north bank of the Fraser River, northwest of the Project footprint
- Site **DgRs-39** consists of a fishing weir and lithic scatter area, located southeast of the Project footprint
- Sites **DgRs-82** and **DgRs-83** consist of lithic scatter areas, both located southeast of the Project footprint

Lehigh Hanson Materials Limited appreciates that “heritage” is not limited to known archaeological sites, and will work with Indigenous groups to ensure that other aspects of cultural heritage are appropriately assessed.



Basemapping from Bing, DataBC and AECOM 2018.

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Legend

Project Location

Approximate Boundary of Project

Stage 1

Stage 2

Archaeological Sites

Overview Map

Lehigh Hanson
HEIDELBERGCEMENT Group

Location: Tilbury Island, Delta, BC

Recorded Archaeological Sites in Proximity to the Project

October 2018

AECOM

Figure 6-1

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, ©

File Location: \\cabny1fp001\prod\Projects\60505051900-CAD_GIS\920-929 (GIS-Graphics)\MXDs\Project_Description\Fig_9_1_Recorded_Archaeological_Sites.mxd Date Revised: October 29, 2018 Reviewed By: JW Paper Size: 8.5"x11" Scale is referenced to the specified

6.2 Potential Effects and Mitigation Measures – Heritage Resources

Potential effects on any archaeological sites that might be present within the Project footprint could result in the disturbance or destruction of any materials. Causes of such adverse effects might include excavation, grading, trenching, and various road construction, and landscaping activities.

To mitigate any potential effects on unrecorded archaeological sites within the Project footprint, a two-stage approach is being proposed:

- Stage 1: an Archaeological Overview Assessment (AOA) of the Project footprint
- Stage 2: an Archaeological Impact Assessment (AIA) (if identified as being necessary as a result of the AOA)

Objectives of the AOA will be

1) to identify areas within the footprint of the proposed development and within the surrounding area that have potential to contain archaeological sites

2) to prepare predictions regarding distribution, density, and variability of archaeological sites within the proposed development area

3) to evaluate the proposed development for its potential to affect archaeological sites

4) to recommend any need and appropriate scope of future archaeological research pertaining to the proposed development

The AOA will be undertaken in accordance with the Guidelines and Objectives put forth in *Archaeological Overview Assessments as General Land Use Planning Tools – Provincial Standards and Guidelines* (2009). Identification of traditional use sites is beyond the scope of an AOA and will not be included. The AOA will be conducted without prejudice to Indigenous Group treaty negotiations, Aboriginal Rights, or Aboriginal Title.

The AOA will include a field reconnaissance and review of archaeological, ethnographic, and historic materials pertinent to the study area, so as to determine the nature of potential prehistoric land use in the Project area. Library and online resources of various institutions will be consulted, including those at the University of British Columbia, Simon Fraser University, the Archaeology Branch of FLNRORD, and the Provincial Heritage Registry Database (PHRD) in Victoria.

The AOA report, developed with support from local Indigenous groups, will include:

- A description of the methodology used for the AOA
- Results of the review of ethnographic, archaeological, geomorphological, and historical documents and works pertinent to the study area
- Identification of First Nations whose asserted traditional territories encompass the proposed development area
- A description of past First Nations land use practices that may have taken place within the proposed development area
- A statement of archaeological resource potential within the proposed development area and in the immediately surrounding area
- A data gap analysis of the nature of the documents and works consulted for the AOA
- Recommendations regarding any need for, and the appropriate scope of, future archaeological research on the proposed development area

7. Potential Effects on Human Health

7.1 Setting

The Project has the potential to affect human health through release of emissions (with pathways to human receptors by inhalation, dermal contact, and ingestion, including through the food chain), and changes in harvesting availability and consumption patterns of sources of upland, shoreline, and marine country foods.

7.2 Potential Effects and Mitigation Measures – Human Health

The Project may result in:

- Increased concentrations of air contaminants and particulate matter, which may cause potential adverse health risk to local communities, including recreational users, residents, and Indigenous groups
- Deposition of dust on plants and soil, which can result in uptake of metals from dust by plants that are then consumed by people, including Indigenous users
- Changes in downstream water quality with potential adverse health effects on humans consuming untreated surface water while undertaking recreational activities
- Changes in downstream water quality with potential adverse health effects on people consuming fish, including Indigenous groups
- Worker and public health and safety
- Stress and annoyance (due to environmental changes)

Potential risks to human health associated with the Project will be evaluated through a quantitative human health risk assessment. Potential for health effects will be considered for workers at the Facility and neighbouring facilities, residents of Delta, and other people who may be exposed through their activities in the area. Appropriate mitigation measures may include:

- Safe work and occupational health plans and associated training during all Project phases
- Public access controls on the Facility to control public safety risks
- Controlling and mitigating noise from the Project experienced by residents of Delta
- Control technologies for reducing emissions and discharges
- Ongoing monitoring of emissions and discharges
- Any disruption of areas used for the harvest of country foods or traditional medicines should they be identified within the Project footprint

8. Potential Changes to the Environment Related to Federal Legislation

8.1 Fish and Fish Habitat

Delivery of Stage 1 and Stage 2 will require in-water works. These activities have the potential to cause serious harm to fish, defined in the federal *Fisheries Act* as:

- *"the death of fish;*
- *a permanent alteration to fish habitat of a spatial scale, duration or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes;*
- *the destruction of fish habitat of a spatial scale, duration, or intensity that fish can no longer rely upon such habitats for use as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes."*

Stage 1 may require alteration of ditches on site. Based on initial Site surveys conducted in May 2018, the Site ditches support populations of three-spined stickleback and pumpkinseed sunfish. Based on fish habitat assessments conducted in May 2018, the affected habitat does not support fish that are part of a Commercial, Recreational or Aboriginal (CRA) fishery, or fish that support such a fishery. Fieldwork was conducted at a time when the presence of resident (i.e., trout) and migratory (i.e., juvenile Pacific salmon) CRA fish species likely to use that type of ditch or tidal channel habitat would have been expected. Therefore, the proposed work, undertaking, or activity has a low likelihood of resulting in serious harm to fish that are part of, or support, a CRA fishery. A low level of uncertainty (i.e., a high level of confidence) applies to this conclusion. As such, it is considered that no Authorization under Section 35(2) of the Fisheries Act is required from DFO.

Stage 2 may require a Fisheries Act Authorization (FAA). The marine terminal will be constructed in the Fraser River and affect an area of high productivity that is assumed to offer rearing habitat for juvenile salmon (FREMP 2015). Stage 2 will also require dredging of the Fraser River to facilitate navigability by the proposed Panamax and Handymax vessels. The Project design and construction methods associated with Stage 2 are not sufficiently advanced currently to enable the potential level of serious harm to be quantified. Many measures are available to mitigate effects of construction activities, including adherence to LRTWs and implementation of BMPs.

8.2 Aquatic Species

As described in Section 5.4, the following Project aspects have potential to affect aquatic species:

- Increase in vessel traffic resulting in louder underwater noise, which may cause displacement or natural behaviour change in fish and marine mammals
- Increase in vessel traffic resulting in increased potential for vessel strikes
- Modification of the Fraser River foreshore, which could affect aquatic species, including aquatic plants

As stated in Section 5.4, construction and operation of Stage 2 has the potential to affect aquatic species federally listed under SARA, including:

- Green Sturgeon – Special Concern
- Porpoise – Threatened
- Humpback Whale – Special Concern
- Southern Resident Killer Whale – Endangered
- Grey Whale – Special Concern
- Steller Sea Lion – Special Concern
- Transient Killer Whale – Threatened

8.3 Terrestrial Animals

Project activities that have the potential to affect terrestrial animals include:

- Clearing and infilling of the Project footprint resulting in the loss of habitat and direct mortality
- Construction and operations, which creates noise, resulting in migratory birds avoiding the area, thereby reducing access to habitat
- The Facility light sources could attract prey (e.g., insects), thereby increasing the presence of bats, with a potential to result in injury through collisions
- Alteration of the foreshore area as a result of the new berth and conveyor belt may:
- act as a barrier to movement
- limit access to feeding habitat
- cause the fragmentation of foreshore habitat

SARA-listed animal species potentially affected by the above Project activities include the following amphibians and mammals:

Amphibians:

- Oregon spotted frog – Endangered
- Western toad – Special Concern

Mammals:

- Pacific water shrew – Endangered
- Townsend's mole – Endangered

Bats:

- Fringed bat – Special Concern
- Keen's long-eared bat – Special Concern[10]
- Little brown myotis – Endangered
- Northern myotis – Endangered
- Pallid bat – Threatened
- Spotted bat – Special Concern

8.4 Migratory Birds and Raptors

Migratory birds are addressed in the *Migratory Birds Convention Act*. Project activities that have the potential to affect migratory birds include:

- Clearing suitable resting or nesting habitat within the Project footprint, specifically the foreshore area
- Construction and operational activities, including marine shipping, that create noise, resulting in migratory birds avoiding the area, thereby reducing access to habitat
- The Facility light sources could attract birds, with a potential to result in injury

There is a likelihood that the Great Blue Heron forages along the foreshore, as there is a large rookery on the Tsawwassen Bluffs, west of the Site. This bird is designated Special Concern under SARA.

Two raptor species may inhabit the Site at times, to be confirmed through field investigations:

- Barn Owl – Special Concern
- Peregrine Falcon – Special Concern

[10] Recent studies show that Keen's Myotis is not genetically distinct from the Long-eared Myotis, and its status may change

9. Potential Changes to the Environment that Could Occur on Federal Land

The Project will not affect federal lands.

10. Potential Changes to the Environment of Transboundary Lands

The Project will not affect transboundary lands. As the Facility is to be located approximately 16 km north of the Canada-USA border, no discharges to water or emissions to air are likely to extend outside BC or Canada, apart from greenhouse-gas (GHG) emissions that are managed regionally. Movement of ships through international waters is not considered to be a transboundary effect of the Project.

11. Indigenous Interests

"Aboriginal Interests" are defined by the EAO as "asserted or proven Aboriginal Rights, including Aboriginal Title, and Treaty rights that require consultation, and if appropriate, accommodation". Examples include hunting, fishing and gathering". Assessment of effects on Aboriginal or Indigenous Interests will include but not be limited to subsection 5(1)(c) of CEAA 2012, "current use of lands and resources for traditional purposes".

Current use of the land portion of the Site for Aboriginal interests in the Project Area is restricted by industrial or agricultural activities on Tilbury Island and the southern portion of Lulu Island. While current commercial and public navigation in the Project Area restricts marine use for traditional purposes, Indigenous groups participate in domestic and Food, Social or Ceremonial (FSC) fisheries in the lower Fraser River for all five species of Pacific Salmon (Chinook, sockeye, chum, coho, and pink), primarily using drift nets (DFO 2018).

A summary description of asserted Aboriginal interest areas and activities for the Indigenous Group identified in Table 1-2 is presented below. Lehigh Hanson Materials Limited will work with these groups to identify current traditional or contemporary use activities within the Project Area.

Cowichan Tribes

The Cowichan Tribes are a member of the Hul'qumi'num Treaty Group (HTG) for the exclusive purpose of negotiating a modern-day treaty under the BC Treaty Process. The HTG asserts Aboriginal rights (including title) and governance through their traditional territory. The Cowichan Tribes is a descendant community of the historic Cowichan Nation (along with Halalt First Nation, Stz'uminus First Nation, Penelakut Tribe, and Lyackson First Nation). Core Cowichan Nation territory includes the watershed boundary of Cowichan Lake and Cowichan River, the watershed boundary of Chemainus River, the Southern Gulf Islands, and extends to the south arm of the Fraser River as far as Douglas Island.

HTG's Statement of Intent asserts the right to fish on marine or fishing territory that overlaps the Site. Cowichan Tribes asserted that their traditional territory encompasses the same territory as the HTG (Cowichan Tribes, n.d.), but also specifies uses in the Fraser River from the mouth to Yale. The asserted traditional fishing territory includes all waters of the Fraser River from Strait of Georgia to Sawmill Creek north of Yale. Cowichan Tribes states that a large and permanent year-round Cowichan Nation residence site called Tl'uqtinus was located on Lulu Island, which is on the north side of the south arm of the Fraser River opposite the Project site. Cowichan Tribes, along with Stz'uminus First Nation, Halalt First Nation, and Penelakut Tribe have filed a notice of civil claim in British Columbia Supreme Court for a declaration of Aboriginal title to the lands of Tl'uqtinus and a declaration of fishing rights along the entirety of the South arm of the Fraser River (Cowichan Tribes, personal communication, November 26, 2018).

Halalt First Nation

Halalt First Nation is a descendant community of the historic Cowichan Nation (along with Stz'uminus First Nation, Penelakut Tribe, Cowichan Tribes, and Lyackson First Nation). Core Cowichan Nation territory includes the south arm of the Fraser River as far as Douglas Island. Further, Halalt First Nation is part of the Hul'qumi'num Treaty Group (HTG); the HTG asserts Aboriginal Rights and governance through their traditional territory as seen in the HTG Statement of Intent Map, which overlaps the Project Site.

Halalt First Nation asserts that a large and permanent year-round Cowichan Nation residence site called Tl'uqtinus was located on Lulu Island, which is on the north side of the south arm of the Fraser River opposite the Project site.

Halalt First Nation, alongside Cowichan Tribes, Penelakut Tribe, and Stz'uminus First Nation, has filed a notice of civil claim in British Columbia Supreme Court for a declaration of Aboriginal title to the lands of Tl'uqtinus and a declaration of fishing rights along the entirety of the South arm of the Fraser River. Halalt First Nation has asserted a Right to Fish in the South Arm of the Fraser River, specifically within the project area. Halalt First Nation, as part of the Cowichan Nation Alliance, is party to a Declaration for Reconciliation for the Tl'uqtinus lands outlining the intent to recover the village site lands and re-establish permanent residence and river access at that site. The Declaration further outlines the reestablishment of cultural practices (namely, fishing and harvesting) and the realization of

socioeconomic benefits that are compatible with re-establishing residence and practices at the village site (Halalt First Nation, personal communication, December 5, 2018).

Katzie First Nation

Katzie First Nation asserts their Aboriginal rights, including the right to resources within Katzie's traditional territory (BCTC, 1994a). Their traditional territory overlaps the Site, encompassing Kirkland Island at the mouth of the Fraser River up to the north end of Pitt Lake, and runs through Delta, Surrey, White Rock, Langley, New Westminster, west of New Westminster to Marpole Avenue in Vancouver, and Maple Ridge (BCTC, 1994a).

Kwantlen First Nation

Kwantlen First Nation asserts Aboriginal Interests within their traditional territory, which overlaps the north end of Tilbury Island (FCRSA 2016a). Kwantlen First Nation's traditional territory extends from Richmond and New Westminster in the west, to Surrey and Langley in the south, east to Mission, and to the northernmost reaches of Stave Lake (Kwantlen FN, 2018). Kwantlen was identified by Fisheries and Oceans Canada as a Nation who fish in segments of the Fraser River between the Port Mann Bridge and Mission (DFO 2014).

Kwikwetlem First Nation

Kwikwetlem First Nation asserts title, jurisdiction, and stewardship over their traditional territory, which centers on the confluence of the lower Coquitlam and Fraser Rivers. The most western point of Kwikwetlem First Nation's territory is to the east of Annacis Island and encompasses the eastern portion of New Westminster and parts of Surrey, extending north to include Coquitlam Lake (JFK Law, 2016). Kwikwetlem First Nation fishes from Douglas Island to the Pattullo Bridge. Fishing effort and species caught are reported to Fisheries and Oceans Canada by the band (2016).

Lake Cowichan First Nation

Lake Cowichan First Nation's asserted traditional territory encompasses Lake Cowichan and the western portion of the Cowichan River (Lake Cowichan FN, 2013). Lake Cowichan is a member of the Hul'qumi'num Treaty Group (HTG).

Lyackson First Nation

Lyackson First Nation's asserted territory is Le'eyqsun (Valdes Island), located in the Strait of Georgia and directly west from the mouth of the Fraser River (Lyackson, 2018). Lyackson also asserts the areas of Tl'uqtinus (Roberts Bank and the South Arm of the Fraser) and the Strait of Georgia within the Salish Sea (Written Submissions of Lyackson First Nation, 2016). Lyackson is a member of the Hul'qumi'num Treaty Group (HTG).

Métis Nation British Columbia

Métis Nation British Columbia represents almost 18,000 provincially registered Métis Citizens in British Columbia. The six chartered communities in the lower mainland region are North Fraser Métis Association (located in New Westminster), Nova Métis Heritage Association (located in Surrey), Waceya Métis Society, Golden Ears Métis Society (located in Maple Ridge), Fraser Valley Métis Association (located in Chilliwack), and Chilliwack Métis Association (located in Chilliwack). There are three chartered communities on south Vancouver Island: Mid-Island Métis Nation Association, Cowichan Valley Métis Association, and The Métis Nation of Greater Victoria Association (Métis Nation British Columbia, 2018).

Musqueam Indian Band

As defined in the Musqueam Declaration, June 10, 1976, Musqueam's asserted traditional core territory (or Musqueam Area of Intent), encompasses the lands of Vancouver, West Vancouver, North Vancouver, New

Westminster, Burnaby, Delta, Surrey, and Richmond, and the waters of the Fraser River and Roberts Bank area, all the waters of the Fraser River Delta, and northwards to include Burrard Inlet and Indian Arm, and into the Salish Sea (Musqueam 2011). According to oral traditions, the Musqueam traveled up the Fraser River as far as Hope during salmon fishing season (Suttles 1998). Historical habitation includes but is not limited to sites located at Marpole, Sea Island, Steveston, Brownsville, Wreck Beach, Jericho Beach, Lumberman's Arch, and near the mouth of the Capilano and Seymour rivers. In addition, numerous seasonal locations allowed for access to resources throughout the lower Fraser River region (Musqueam Band Council 1984). Musqueam Indian Band members have a legally established Aboriginal right to fish for food, social and ceremonial purposes in the area of Canoe Pass on the South Arm of the Fraser River (SCC 1990; also described therein as the “waters of Ladner Reach and Canoe Passage”). Musqueam also asserts a right to fish throughout their traditional territory, a broader area that extends from the north shore of Burrard Inlet to the south shore of the main channel of the Fraser River, including waters of the three channels through which the Fraser River reaches the ocean (SCC 1990). This area includes, and is not limited to, all waters of the Fraser River that flow downstream of the Port Mann Bridge to the Strait of Georgia (EAO and VFPA [previously Port Metro Vancouver] 2012). Musqueam 4, located at Canoe Pass, is the closest reserve to the Site, approximately 10.1 km away.

Penelakut Tribe

Penelakut Tribe’s asserted territory is located in the southern Gulf Islands and includes Penelakut Island, Tsussie, Tent Island, and Galiano Island (FNMHF, 2018). Penelakut is a member of the Hul’qumi’num Treaty Group (HTG).

Seabird Island Band

Seabird Island Band resides on Seabird Island east of Agassiz and is a member of the Stó:lō Tribal Council (AANDC, 2017). Seabird Island Band was identified by Fisheries and Oceans Canada as a Nation who fish in areas between Mission and the confluence of the Fraser River with Sawmill Creek (DFO 2014).

Semiahmoo First Nation

The Semiahmoo First Nation’s main community and offices are located on the Semiahmoo Reserve which is between the boundary of White Rock, British Columbia and the Canada-United States boundary and Peace Arch Provincial Park (MOT, 2006).

Stz’uminus First Nation

The Stz’uminus First Nation is a Coast Salish Indigenous group whose ancestors have lived around the Salish Sea for thousands of years and have traditionally lived in permanent villages including those of what is known today as Kulleet Bay, Sibell Bay (or Shell Beach), the Chemainus River, and the South Arm of the lower Fraser River. The Stz’uminus First Nation is a descendant community of the historic Cowichan Nation (along with Cowichan Tribes, Halalt First Nation, Penelakut Tribe, and Lyackson First Nation). Stz’uminus First Nation asserts that a large and permanent year-round Cowichan Nation residence site called Tl’uqtinus was located on Lulu Island, which is on the north side of the south arm of the Fraser River opposite the Project site. The Stz’uminus First Nation, along with Cowichan Tribes, Halalt First Nation, and Penelakut Tribe, has filed a notice of civil claim in British Columbia Supreme Court for a declaration of Aboriginal title to the lands of Tl’uqtinus and a declaration of fishing rights along the entirety of the South arm of the Fraser River (Stz’uminus First Nation, personal communication, December 7, 2018).

Tsawwassen First Nation

Tsawwassen First Nation has treaty rights relating to the Tsawwassen First Nation Final Agreement (TFNFA) signed in 2009. The TFNFA secures harvesting rights in areas located within Tsawwassen Territory, defined as the area of land and waters that extend from the southern Gulf Islands to the area around Pitt Lake (TFN et al. 2010), which encompasses the Fraser River and the location of the Site.

Tsleil-Waututh Nation

Tsleil-Waututh Nation asserted traditional territory encompasses part of the Fraser River (north of Tilbury Island) and north to Mamquam Lake (east of Whistler) (BCTC 1994b).

12. Potential Effects on Indigenous Peoples from Changes to the Environment

Project activities have the potential to affect the interests of Indigenous peoples through changes in the environment. Potential effects include:

- Health and socio-economic conditions
- Physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance
- Current use of lands and resources for traditional or contemporary purposes

Table 12-1 summarizes a preliminary identification of potential effects on Indigenous peoples from the Project, or from cumulative effects with other projects.

Table 12-1 Potential Effects on Indigenous Peoples from Changes to the Environment

CEAA Subsection 5(1)(c) factor	Potential Effects
Health and socio-economic conditions	• Exposure to noise, light and air emissions • Biological agent exposure • Safety risks related to vessel traffic • Reduction in quantity of fish for an Aboriginal rights fishery • Revenue loss associated with potential disruption of commercial fishing activity • Employment and contracting opportunities • Reduction of migratory bird-hunting opportunities • Loss of sense of place and cultural continuity
Physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	• Changes to fisheries habitat • Changes to access to fishing for food, social, medicinal and ceremonial purposes • Environmental disturbance which may alter landscapes or waterways, and may result in visual impacts • Changes to heritage resources or structures of cultural importance that may alter the landscape, waterscape or viewscape, resulting in a changed sense of place • Effects to cultural continuity
Current use of lands and resources for contemporary and traditional purposes	• Changes to the accessibility of preferred sites for traditional purposes • Environmental changes which may alter the availability, quantity and quality of preferred resources for traditional purposes • Potential changes to the quality of a traditional use experience due to increased noise, light, perceived safety risk or altered sense of place • Avoidance or preferred sites for traditional purposes resulting in a loss of intergenerational knowledge transfer

13. Engagement and Consultation to Date

13.1 Identification of Indigenous Groups

Indigenous groups which have been identified for consultation are listed in Table 1-2 (Section 1.3.1) above.

13.2 Consultation Activities to Date

Consultation activities with all Indigenous groups listed in Section 1.3.1 were initiated in the summer of 2018. Project introduction letters were distributed, which included an introduction to Lehigh Hanson Materials Limited, an overview of the proposed Project, a description of the environmental assessment process, and other required approvals. Per request, KMZ and shapefiles were also provided. A draft Project Description was provided to all Indigenous groups in the table below for review and input. Based on the outcome of initial communications, Lehigh Hanson Materials Limited has continued sharing information and is meeting with Indigenous groups who have shown interest. Key points are summarized in Table 13-1 below.

Table 13-1 Consultation Activities to Date[11]

Indigenous Group (in alphabetical order)	Activity	Key Points
Cowichan Tribes	Letter, emails, phone calls, in-person meeting	• Lehigh Hanson Materials Limited met with Cowichan Tribes (alongside other Cowichan Nation Alliance members) on September 21, 2018 to provide a general overview of the Project. Clarifications on plant operation and size of the marine terminal area was provided by Lehigh Hanson Materials Limited. • Cowichan Tribes provided comments to Lehigh Hanson Materials Limited on the draft Project Description on November 26, 2018, including information pertaining to Cowichan Tribes territory.
Halalt First Nation	Letter, emails, phone calls, in-person meeting	• Lehigh Hanson Materials Limited met with Halalt First Nation (alongside other Cowichan Nation Alliance members) on September 21, 2018, to provide a general overview of the Project. Clarifications on plant operation and size of the marine terminal area was provided by Lehigh Hanson Materials Limited. • Lehigh Hanson Materials Limited provided information on project timelines and government processes to Halalt First Nation. • Halalt First Nation provided comments to Lehigh Hanson Materials Limited on the draft Project Description on December 5, 2018, including information pertaining to Halalt First Nation territory.
Katzie First Nation	Letter, emails, phone calls	• PRRO deferred Lehigh Hanson Materials Limited's referral to the Katzie First Nation. • Katzie First Nation provided a letter Lehigh Hanson Materials Limited on September 25, 2018, that confirmed the Project is within Katzie traditional territory and provided requests regarding appropriate archaeological assessments prior to earthworks and indicated that a Katzie First Nation archaeological monitor may be required on-site during earthworks. Katzie First Nation requested that revegetation, planting requirements, and slope stabilization measures use native plant and grass species only. • Katzie First Nation provided comments to Lehigh Hanson Materials Limited on the draft Project Description on November 9, 2018.
Kwantlen First Nation	Letter, emails, phone calls, in-person meeting	• PRRO deferred Lehigh Hanson Materials Limited's referral to the Kwantlen First Nation. • Lehigh Hanson Materials Limited met with Kwantlen First Nation on December 13, 2018, to provide a general overview of the project. Kwantlen First Nation discussed concerns relating to: – regional studies; – cumulative effects on Tilbury Island; and, – resident orcas.

[11] Reflects consultation between Lehigh Hanson Materials Limited and Indigenous Group from June 2018 to December 2018.

Indigenous Group (in alphabetical order)	Activity	Key Points
Kwikwetlem First Nation	Letter, emails, phone calls in-person meeting	• Lehigh Hanson Materials Limited met with Kwikwetlem First Nation on November 15, 2018, to provide a general overview of the Project. Kwikwetlem First Nation had questions concerning project size and description, project schedule, and the EA process.
Lake Cowichan First Nation	Letter, emails, phone calls	• Lehigh Hanson Materials Limited provided clarifications regarding specific Site information to Lake Cowichan First Nation. • Lake Cowichan Nation indicated that they defer to Nation(s) whose title and governing authorities are directly affected by the project; however, should Lake Cowichan Nation identify greater interests in the project in the future, they retain the right to revise their assessment.
Lyackson First Nation	Letter, emails	• No comments or concerns received from Lyackson First Nation to date. • Lehigh Hanson Materials Limited is engaging with Lyackson First Nation to determine whether they have an in the project.
Musqueam Indian Band	Letter, emails, phone calls, in-person meeting	• PRRO deferred Lehigh Hanson Materials Limited's referral to the Musqueam Indian Band. • Lehigh Hanson Materials Limited met with Musqueam on September 25, 2018, to provide a general overview of the Project. Musqueam indicated they have established rights/interests that are legally asserted within the area of the Project. Musqueam discussed concerns relating to: – impacts on Musqueam Rights and Interests; – the sensitive and critical nature of the Site; and, – inadequacy of the BC and Canada assessment process. • Lehigh Hanson Materials Limited provided Musqueam the summary of studies conducted and anticipated for the Project. • Lehigh Hanson Materials Limited followed up with clarifications regarding project size and description, capital costs, and links between the Project and other Lehigh Hanson Materials Limited permitting activities. • Musqueam inquired as to whether the Gilly's Quarry Mine is linked to the Project or has the potential to be linked to the Project in the Future. Lehigh Hanson Materials Limited clarified that Gilley's Quarry Mine will not have any link to the Project. • Lehigh Hanson Materials Limited provided Musqueam with an estimate of marine traffic for the Project. • Musqueam provided Lehigh Hanson Materials Limited with comments on the draft Project Description on December 7, 2018. Musqueam provided Lehigh Hanson Materials Limited with resources to use in preparation of draft Environmental Assessment materials.
Métis Nation of British Columbia		• Lehigh Hanson Materials Limited is engaging with Métis Nation British Columbia to determine whether they have an interest in the project.
Penelakut Tribe	Letter, emails, meeting summary	• No comments or concerns received from Penelakut Tribe to date. • Lehigh Hanson Materials Limited provided notes from a September 21, 2018 meeting with other Cowichan Nation Alliance members. • Lehigh Hanson Materials Limited is engaging with Penelakut Tribe to determine whether they have an interest in the project.
Seabird Island Band	Letter, emails, phone calls	• Lehigh Hanson Materials Limited has engaged with Seabird Island Band to determine whether they have an interest in the project. Seabird Island Band confirmed that the project does not fall in the core area of Seabird Island Band's traditional territory, and requested that they continue to receive information about the project. • Seabird Island Band inquired about potential impacts to fisheries. Lehigh Hanson Materials Limited indicated that the proposed project includes a berth in the river and a marine shipping route. Seabird Island noted that they would review the water portions of the referral.
Semiahmoo First Nation	Letter, emails	• No comments or concerns received from Semiahmoo First Nation to date. • Lehigh Hanson Materials Limited is engaging with Semiahmoo First Nation to determine whether they have an interest in the project.
Stz'uminus First Nation	Letter, emails, phone calls, in-person meeting	• Lehigh Hanson Materials Limited met with Stz'uminus First Nation (alongside other Cowichan Nation Alliance members) on September 21, 2018, to provide a general overview of the Project. Clarifications on plant operation and size of the

Indigenous Group (in alphabetical order)	Activity	Key Points
		marine terminal area was provided by Lehigh Hanson Materials Limited. • Stz'uminus First Nation provided Lehigh Hanson Materials Limited with comments on the draft Project Description on December 7, 2018.
Tsawwassen First Nation	Letter, emails, in-person meeting	• PRRO deferred Lehigh Hanson Materials Limited's referral to the Tsawwassen First Nation. • Lehigh Hanson Materials Limited met with Tsawwassen First Nation on November 15, 2018 to provide a general overview of the Project. Tsawwassen First Nation inquired about the potential impacts to sturgeon and economic opportunity for Tsawwassen First Nation. They discussed concerns relating to: – possible impacts to fishing rights and migratory bird harvesting; – health of salmon and salmon habitat; – access; – cumulative effects; and, – heritage and archaeological considerations.
Tsleil-Waututh Nation	Letter, emails, phone calls in-person meeting	• PRRO deferred Lehigh Hanson Materials Limited's referral to the Tsleil-Waututh Nation. • Lehigh Hanson Materials Limited met with Tsleil-Waututh Nation on October 25, 2018 to provide a general overview of the Project. Tsleil-Waututh stated they need to ensure its values, title, rights, and interests are protected before a proposal can proceed in their territory, in accordance with their Stewardship Policy. Tsleil-Waututh inquired on expected Project timelines.

In addition to the consultation activities to date listed above, archaeology permits to conduct an AOA were obtained from those Indigenous groups that have permit systems in place including, and not limited to, Musqueam and Tsleil-Waututh.

13.3 Governments, Public, and Other Parties

13.3.1 Stakeholders and Related Consultation Activities

Lehigh Hanson Materials Limited is committed to ongoing consultation with identified, interested and potentially affected stakeholders. Stakeholders are listed in Table 1-3.

13.3.2 Consultation to Date

On February 8, 2018, Lehigh Hanson Materials Limited attended a meeting with the CEA Agency and BC EAO to introduce Lehigh Hanson Materials Limited and the proposed Project.

Lehigh Hanson Materials Limited continues to actively engage with the City of Delta to discuss the Project permitting and the requirements to have the Site rezoned from I2, Heavy Industrial, to I7, Special Industrial, which includes manufacturing, processing, finishing, and storage of cement and other permitting requirements.

Lehigh Hanson Materials Limited attended a meeting Metro Vancouver on October 12, 2018, to discuss the requirement surrounding the modelling of potential air quality effects and the subsequent air quality permit.

13.3.3 Ongoing Consultation and Engagement with Governments, Public and Other Parties

Lehigh Hanson Materials Limited will seek to engage in meaningful dialogue with all interested parties throughout the EA Process, to this end, Lehigh Hanson Materials Limited will develop a Public Engagement Plan. The goal of engagement with interested parties is to:

- Develop a positive long-term relationship with stakeholders potentially affected by the Project
- Integrate input from stakeholders into the EA process, and Project design where practicable

- Communicate Project information in a timely fashion and demonstrate how the stakeholder's input has been incorporated in to the EA process, Project design and/or inform future consultation efforts

To achieve these goals Lehigh Hanson Materials Limited will:

- Provide opportunities for stakeholders to learn more about the Project and discuss key topics of interest
- Launch a Project website that will provide Project information and Project updates, and also support a contacts database allowing direct communication to publicise opportunities such as open houses and Project updates
- Maintaining communication records, through meeting minutes and records
- Recording issues and concerns expressed by stakeholders, and responses by Lehigh Hanson Materials Limited

This Project Description will be shared with stakeholders via the BC EAO Project Information and Collaboration site (ePIC) website, and if applicable, the CEA Agency Canadian Environmental Assessment Registry. The draft AIR will also be shared with stakeholders and their feedback will be sought and considered.

13.3.4 Discussions with Other Jurisdictions

It is not anticipated at this time that there will be other jurisdictions that will have an interest in the Project that have not already been identified in previous sections.

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