CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
BHP Potash Export Facility at Fraser Surrey Docks

Prepared for:
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130 3rd Avenue South
Saskatoon, SK S7K 1L3

Prepared by:
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18th Floor, 4730 Kingsway
Burnaby, BC V5H 0C6

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EXECUTIVE SUMMARY

The following Construction Environmental Management Plan (CEMP) provides guidance on mitigating Project-related effects during development of the potash export facility (Project) proposed by BHP Billiton Canada Inc. (BHP) at the Fraser Surrey Docks (FSD) terminal located at 11060 Elevator Road in Surrey, British Columbia (BC). The CEMP is part of the Project and Environmental Review Application to the Vancouver Fraser Port Authority (VFPA) for a Category D review. This document follows the VFPA Guidelines for Construction Environmental Management Plans (VFPA 2015).

This CEMP provides measures that will avoid or mitigate potential construction-related effects to environmental resources and/or the surrounding community, and describes the Project's:

- Setting, activities, and schedule, providing guidance on roles and responsibilities
- Regulatory framework
- Measures to mitigate adverse effects of the Project
- Emergency response procedures.

Best practices proposed in the CEMP are based on Project scope, assessments completed on the Project site to date, current environmental conditions of the site, and common environmental construction techniques.

Located on the south side of the Fraser River in Surrey, BC in an industrial area adjacent to Highway 17 (South Fraser Perimeter Road), the Project site primarily consists of paved surfaces used for shipping container storage, access roads and rail infrastructure, and administrative and maintenance buildings. As with the upland areas of the site, the aquatic habitat within and surrounding the Project site has been highly modified from its pre-development setting by filling and paving, as well as urbanisation. While there have been numerous site modifications, there are archaeological and ethnographic sensitivities based on the number and importance of nearby archaeological sites, and past and present use of the Fraser River by First Nations groups.

Construction activities proposed for the Project include site preparation (e.g., demolition, utility realignment, soil densification, supply and storage of construction materials) as well as construction of shore-side infrastructure, inwater works, upland infrastructure, rail loop with access improvements, and connecting utilities. Onsite environmental monitoring of the construction works is a key component for compliance with the CEMP. BHP will require a qualified Environmental Monitor (EM) to be available to monitor activities that could affect environmentally sensitive areas during construction.
The Project is located on federal land administered by VFPA; therefore, federal and VFPA regulations and policies are applicable to the site. The construction contractor will be responsible for having all required permits necessary to undertake the construction and ensure compliance with the terms and conditions of these permits.

The CEMP builds on the mitigation measures identified by the technical discipline leads in their assessments. Included in this plan are outlines of mitigation measures and management practices for:

- General construction practices
- Site access, mobilisation, and laydown activities
- Air quality
- Noise and vibration
- Machinery and equipment
- Concrete works and grouting
- Contaminated sites and groundwater management
- Underground Storage Tank (UST) decommissioning and removal
- Erosion and sediment control
- Marine works
- Management of vegetation, wildlife, and upland aquatics
- Sensitive habitat features and species
- Archaeological resources
- Fuel management
- Waste management
- Hazardous materials management
- Emergency response.
- Pre-loading

The level of detail provided for each component above is scaled to the size and complexity of the Project and the potential for Project-related activities to generate effects.
ACRONYMS, ABBREVIATIONS, SYMBOLS, AND UNITS OF MEASURE

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQP</td>
<td>appropriately qualified professional</td>
</tr>
<tr>
<td>BC</td>
<td>British Columbia</td>
</tr>
<tr>
<td>BHP</td>
<td>BHP Billiton Canada Inc.</td>
</tr>
<tr>
<td>BMP</td>
<td>best management practice</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction Environmental Management Plan</td>
</tr>
<tr>
<td>CSR</td>
<td>Contaminated Sites Regulation</td>
</tr>
<tr>
<td>CRA</td>
<td>commercial, recreational, and Aboriginal</td>
</tr>
<tr>
<td>DFO</td>
<td>Fisheries and Oceans Canada</td>
</tr>
<tr>
<td>EM</td>
<td>Environmental Monitor</td>
</tr>
<tr>
<td>FRPD</td>
<td>Fraser River Pile &amp; Dredge</td>
</tr>
<tr>
<td>FSD</td>
<td>Fraser Surrey Docks</td>
</tr>
<tr>
<td>Hemmera</td>
<td>Hemmera Envirochem Inc.</td>
</tr>
<tr>
<td>IL</td>
<td>Industrial land use</td>
</tr>
<tr>
<td>OGV</td>
<td>ocean-going vessel</td>
</tr>
<tr>
<td>OHS</td>
<td>occupational health and safety</td>
</tr>
<tr>
<td>PCB</td>
<td>polychlorinated binphenyl</td>
</tr>
<tr>
<td>PPE</td>
<td>personal protective equipment</td>
</tr>
<tr>
<td>Project</td>
<td>proposed potash export facility</td>
</tr>
<tr>
<td>SARA</td>
<td><em>Species at Risk Act</em></td>
</tr>
<tr>
<td>SDS</td>
<td>Safety Data Sheet</td>
</tr>
<tr>
<td>VFPA</td>
<td>Vancouver Fraser Port Authority</td>
</tr>
<tr>
<td>UST</td>
<td>Underground storage tank</td>
</tr>
<tr>
<td>WCB</td>
<td>Workers Compensation Board</td>
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</table>

<table>
<thead>
<tr>
<th>Symbol, Unit of Measure</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>%</td>
<td>percent</td>
</tr>
<tr>
<td>°C</td>
<td>degrees Celsius</td>
</tr>
<tr>
<td>cm</td>
<td>centimetre</td>
</tr>
<tr>
<td>dB</td>
<td>decibel</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>mm</td>
<td>millimetre</td>
</tr>
</tbody>
</table>
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1.0 INTRODUCTION

Hemmera Envirochem Inc. (Hemmera) has been retained by BHP Billiton Canada Inc. (BHP) to prepare a Construction Environmental Management Plan (CEMP) for the property located at 11060 Elevator Road in Surrey, British Columbia (BC). BHP is proposing to construct and operate (in conjunction with Fraser Surrey Docks (FSD) a potash export facility (Project) on the south bank of the South Arm of the Fraser River. Figure 2-1 shows the site plan for the Project, which is located on federal lands within the jurisdiction of the Vancouver Fraser Port Authority (VFPA). The Project will serve to export potash produced by the Jansen Mine in Saskatchewan via bulk ocean-going vessels (OGVs). The proposed facility includes a new shiploader, rail car unloading station, conveyor system, potash storage building, and rail loop (Figure 2-1).

The intent of the CEMP is to identify the standard of environmental management practice along with practical and effective measures that will avoid or mitigate potential adverse effects to environmental resources or the surrounding community. Best practices proposed in the CEMP are based on current environmental conditions and resources likely to be present onsite, common and anticipated construction techniques, Project scope, and environmental assessments completed on the site. Once a construction contractor has been retained to carry out the work, the CEMP will be updated to reflect the construction methods and associated mitigation measures to avoid or minimise adverse effects.
2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The Project site is located at 11060 Elevator Road, in the City of Surrey, BC. Land title and site information is provided below in Table 2-1. The geographical coordinates at the Project’s approximate centre are 506688 m east and 5448249 m north (UTM10N NAD83), and border the Fraser River to the north. Figure 2-2 shows the Project location.

Table 2-1 Land Title Information

<table>
<thead>
<tr>
<th>Civic Address</th>
<th>11060 Elevator Road, Surrey, BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PID</td>
<td>023-512-547, 000-725-234, 023-512-539, 023-512-521, 023-512-512</td>
</tr>
<tr>
<td>Legal Description</td>
<td>Lot 4, Section 34, Block 5N, Range 3W, NWD PL LMP 29318 Parcel L Reference Plan 6744: Sections 34 &amp; 35, Block 5N, Range 3W Except: Firstly: part on Crown Grant 136463E; NWD Lot 3, Sections 34 &amp; 35, Block 5N, Range 3W, NWD PL LMP29318 Lot 2, District Lot 14, Group 2 and of the bed of the Fraser River NWD PL LMP 29318 Lot 1, District Lot 12 &amp; 13, PL LMP39318 NWD</td>
</tr>
<tr>
<td>Registered Land Owner</td>
<td>Crown federal</td>
</tr>
<tr>
<td>Area</td>
<td>~29 hectares</td>
</tr>
<tr>
<td>Zoning</td>
<td>IL – Light impact industrial</td>
</tr>
<tr>
<td>Percent Site Coverage</td>
<td>~90% of the site is asphalt, ~10% is buildings.</td>
</tr>
</tbody>
</table>
2.2 PROJECT SETTING

The following section describes the Project setting, including socio-community conditions, terrestrial and aquatic environment conditions, archaeological potential, land tenure and classification, and weather and climate.

2.2.1 Social and Community Conditions

The Project site is located on the south side of the Fraser River in Surrey, BC (Figure 2-2) in an industrial area adjacent to Highway 17 (South Fraser Perimeter Road). The site is adjacent to the Whalley town centre in Surrey and approximately 100 m from the boundary of the Corporation of Delta (Delta). The City of New Westminster is located on the north side of the Fraser River directly across from the Project. The Project site has been an industrial port facility since the early 1930s.

The nearest residences are located on Regal Drive, Royal Crescent, and River Road in Surrey, approximately 75 metres (m) from the Project site boundary (Figure 2-2). The nearest schools are Royal Heights Elementary School (11665-97 Avenue in Surrey) and Annieville Elementary School (112 Street in Delta), which are situated approximately 600 m to 700 m from the Project site (Figure 2-2). The nearest park is Royal Heights Park, in Surrey, located approximately 300 m from the Project site (Figure 2-2).

2.2.2 Terrestrial Environment Conditions

The Project site was developed in the 1960s for use as a shipping facility, and was cleared of vegetation. By the 1990s, the Project site had been developed to its current operations. The Project site consists primarily of paved surfaces used to handle and store shipping containers, roads and rail infrastructure, and administrative and maintenance buildings. The Project would take place on industrial land where vegetation and wildlife habitat are typical of an urban-industrial area.

2.2.3 Aquatic Environment Conditions

The Fraser River, Gunderson Slough (to the south of the Project), and Manson Canal (to the northeast of the Project) provide direct habitat value for fish, including commercial, Aboriginal, and recreational species. Several of the upland drainages connecting to these watercourses also have potential to provide food and nutrient values for fish; however, the aquatic habitat within and surrounding the Project site has been highly modified from its pre-development setting, including filling and paving, as well as other development consistent with its use as a port terminal. Drainage within the upland section of the site is generally channelised or culverted and isolated from fish-bearing habitat. The Fraser River shoreline in the vicinity of the Project has been riprapped and a berth face installed. Several ditches at the south edge of the Project appear to be hydraulically connected on its downstream end to Gunderson Slough.
2.2.4 Archaeological Potential

The Archaeology Overview Assessment (Attachment 4.2-U of the Application) indicates that despite the degree of site modification, there are archaeological and ethnographic sensitivities based on the number and importance of nearby archaeological sites, and past and present use of the Fraser River by First Nations peoples. Portions of the Project development area that are located above the former shoreline and now overlain by imported fill, are considered to have high archaeological potential (see Archaeological Potential – Preliminary Assessment Report, Attachment 4.2-T of the Application).

2.2.5 Land Tenure and Classification

FSD currently operates the terminal in the area surrounding the proposed Project area, which is situated on federal land within VFPA jurisdiction, with the majority of the Project on FSD lease land. The southeast portion of the site is bounded by a rail right-of-way on VFPA land. The rail upgrades for the Project will require alterations within the Port Authority Rail Yard, a VFPA-owned railway yard operated by FSD and supported by rail agreements with Canadian National Railway, Southern Railway of BC, Burlington Northern and Santa Fe Railway, and Canadian Pacific Railway.

The Land Use Plan for VFPA designates the Project area as a Port Terminal (VFPA 2014). The Project is consistent with VFPA’s land use designation of Port Terminal.

The Project site and adjacent Port lands are designated as Industrial in Surrey’s Official Community Plan (City of Surrey 2014). Lands surrounding the Project west of Highway 17 are designated as commercial, industrial, and mixed use. East of Highway 17, land use is predominantly residential and institutional (school).

2.2.6 Weather and Climate

The Project is situated within the Pacific Maritime Ecozone, characterised by high annual precipitation (1113 millimetres (mm)) falling mostly as rain in winter, and dry summers (approximately 40 mm in July and August). Weather and climatic conditions at Vancouver International Airport, the closest weather station, are summarised in Table 2-2.

Table 2-2 Project Site Climate Information

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Pacific Maritime Ecozone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Temperature Range</td>
<td>5°C to 20°C</td>
</tr>
<tr>
<td>Average Total Annual Precipitation</td>
<td>1113 mm at YVR, 19km to the West</td>
</tr>
<tr>
<td>Weather Forecasts</td>
<td><a href="http://www.weather.gc.ca">www.weather.gc.ca</a>,</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.theweathernetwork.com">www.theweathernetwork.com</a></td>
</tr>
<tr>
<td>Weather Phone (Environment Canada)</td>
<td>604.885.4100</td>
</tr>
<tr>
<td>Weather Notices (Environment Canada)</td>
<td><a href="http://www.weatheroffice.pyr.ec.gc.ca/e-products">www.weatheroffice.pyr.ec.gc.ca/e-products</a></td>
</tr>
</tbody>
</table>
2.3 PROJECT DESCRIPTION

The BHP potash export facility will ship potash produced by the Jansen mine via bulk OGVs, and its location at FSD will include rail receiving, onsite storage, and OGV loading facilities. The FSD site was selected for the Project because it is an active marine terminal with much of the required berthing and associated infrastructure already in place, and is well serviced by existing rail and road infrastructure.

The Project will facilitate potash exports by BHP as follows:

- Receive shipments of potash by rail from the Jansen mine.
- Offload potash from rail cars to the storage building or directly to waiting vessels.
- Store potash in the potash storage building.
- Transfer potash via a conveyor system to the shiploader and to waiting vessels for international export.

The Project is anticipated to occupy approximately 29 hectares of the FSD site, including Berth #9, Yard Area 9, and a portion of the current container yard (Figure 2-1). Key Project infrastructure are shown on Figure 2-3 and include:

- Rail car unloading facility
- Material handling and transfer systems
- Potash storage building
- Berth improvements and new shiploader
- Rail car unit train loop
- Utility and access improvements (e.g., pedestrian overpass, line painting, etc.).

Buildings to be demolished as part of the Project are shown in Figure 2-4. Additional information on pre-loading is provided in Section 5.17.
This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

This extent should be considered approximate only.

Basemap: Ortho Imagery from City of Surrey.

Sources

NAD 1983 UTM Zone 10N
Page Size: 11" x 17"

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Production Date: May 11, 2018
Figure 2-3
Figure 2-4  Buildings to be Demolished
2.4 **PROJECT SCHEDULE**

Construction will take approximately three to four years to complete and timing is subject to approval of the Board of BHP, and receipt of construction permits. This would not occur before Q1 2019.

An overview of key Project activities and approximately timing is provided in **Table 2-3**.

All other on-site construction will be scheduled Monday to Saturday from 7:00 am to 8:00 pm in order to maximize construction efficiencies and minimize construction duration. The majority of on-site construction activities will occur during the day to minimize nighttime noise nuisance. Offsite modularization construction will minimize onsite construction hours and impacts to community. Construction activities may be performed in the evening and/or night to meet construction requirements and to optimise construction efficiencies at times during peak construction. Activities will be scheduled as such to have minimum impact on the surrounding community.

If Project construction hours are required outside of VFPA’s standard work hours (Monday to Saturday from 7:00 am to 8:00 pm), written approval for authorized work from VFPA will be applied for in accordance with the VFPA PER Extended Work Hours Guidelines, prior to construction.

**Table 2-3  Estimated Project Schedule Overview**

<table>
<thead>
<tr>
<th>Project Activity</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
<td>Q4</td>
</tr>
<tr>
<td>Site Preparation and Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demolition and utility relocation</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Soil densification for potash storage building</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail car unloading station</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potash storage building</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Utilities and on-site infrastructure</td>
<td></td>
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<tr>
<td>Ancillary facilities</td>
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</tr>
<tr>
<td>Shiploader</td>
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</tr>
<tr>
<td>Reclaimer</td>
<td></td>
<td></td>
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<tr>
<td>Wharf and marine structures</td>
<td></td>
<td></td>
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<tr>
<td>Commissioning and Operation</td>
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<tr>
<td>Commissioning</td>
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</tbody>
</table>
3.0 CONTACTS AND RESPONSIBILITIES

3.1 KEY PROJECT PERSONNEL

The following section describes key participants whom are involved with the Project throughout the construction phase, including regulators. Table 3-1 lists the key Project participants.

Table 3-1 Key Project Participants¹

<table>
<thead>
<tr>
<th>Name</th>
<th>Role/Company</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruce Larson</td>
<td>Engineer of Record/Ausenco</td>
<td>604-684-9311</td>
</tr>
<tr>
<td>Roger Tremblay</td>
<td>Engineering Manager/BHP</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>Valerie Bond</td>
<td>Principal Environment/BHP</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>Travis Pankiw</td>
<td>Principal Construction/BHP</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>Garry Miller</td>
<td>Project Manager/BHP</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>TBD</td>
<td>Health and Safety Lead/BHP</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>Rajan Mann</td>
<td>General Manager/FSD</td>
<td>604-581-2233</td>
</tr>
<tr>
<td>TBD</td>
<td>Site Foreman/Contractor</td>
<td>TBD</td>
</tr>
<tr>
<td>TBD</td>
<td>Environmental Monitor/Contractor</td>
<td>TBD</td>
</tr>
<tr>
<td>Robin Taylor</td>
<td>Environmental Manager/Hemmera</td>
<td>604-669-0424</td>
</tr>
</tbody>
</table>

¹Table to be reviewed and updated, as needed, prior to construction.

3.2 ENVIRONMENTAL MONITORING RESPONSIBILITIES

This section describes the responsibilities and qualifications that will be required for conformance monitoring during construction.

3.2.1 Appropriately Qualified Professional

Specialized environmental monitoring tasks during construction are required to be performed by an appropriately qualified professional (AQP) (e.g., pre-clearing bird nest surveys, amphibian salvages, and hazardous material abatement). An AQP is an applied scientist or technologist specializing in a relevant discipline (e.g., archaeology, biology, and engineering). The AQP must be recognized in BC with the appropriate professional organization, registered and in good standing, and acting under that organization’s Code of Ethics and subject to disciplinary action by that organization. They must also be someone who, through demonstrated suitable education, experience, accreditation and knowledge directly related and relevant to the level and responsibilities of the particular matter, may be reasonably relied on to provide advice within his or her area of expertise and experience (BC Ministry of Transportation and Infrastructure 2016). The AQPs for this Project will be retained by the Contractor.
3.2.2 Environmental Monitor

Onsite monitoring of the construction works is a key component for conformance in the CEMP. BHP will require that a qualified Environmental Monitor (EM) shall be available to monitor activities that could affect environmentally sensitive areas during construction. The frequency of visits will be dependent upon the work tasks for each day, but an EM will be present for any intrusive work (i.e. soil excavation or movement), in-water works, installation, inspection, and maintenance of any erosion and sediment control measures, and at the start-up of any new phases of work. The EM will be an AQP, or working under the direct supervision of an AQP.

The EM will have the authority to stop work if the individual determines that some aspect of the construction is creating or will result in a substantial adverse effect on environmental values or resources, on or adjacent to the Project. The EM will verify conformance with the CEMP, the applicable regulatory framework, and any best management practices (BMPs) expected at construction sites.

The EM will complete and submit environmental monitoring reports to the applicant and regulatory bodies (if required within permit or approval criteria). Typically, the EM will complete daily reports for each day onsite for internal distribution, and will prepare monthly summaries for external distribution (permit/approval legislative body). These reports will include a summary of activities completed by other AQPs.

Other tasks associated with the EM include, but are not limited to:

- Communicating and coordinating with the Contractor for appropriate scheduling of onsite visits based on work tasks for the three-month look-ahead schedule.
- Participating in daily tailgate meetings and discussing relevant sections of the CEMP with the work crew for a given day or task.
- Halting work if the tasks planned can cause adverse effects to the environment.
- Monitoring the effectiveness of mitigation measures (e.g. preventing serious harm to fish).
- Communicating with the Contractor on any issues with the proposed work schedule or planned tasks that may have adverse environment effects (e.g., work outside fish window, or in areas with nesting migratory birds).
- Completing field screening during construction or excavation activities, UST decommissioning and removal oversight, soil sampling for characterization and disposal purposes, and in-situ confirmation of remediation sampling.
- Completing incidents reports (e.g., spills, stop work orders), and reporting incidents to the appropriate contacts onsite.
- Helping guide the Contractor in achieving sound environmental management during Project construction.
Upon completion of the construction work onsite, the EM will prepare a final report that will document the work completed, any discharges from the site (waste, spills, water, soil), as well as remedial actions taken to rectify any environmental issues onsite. This report will be sent to VFPA and applicable regulatory agencies.

3.3 **PROPOSENT/CONTRACTOR RESPONSIBILITIES**

During Project construction, BHP will require that the Contractor’s onsite employees and subcontractors adhere to the CEMP’s environmental protection objectives. Specifically, the following responsibilities will be adhered to:

- Confirm that all employees and subcontractors onsite will conform with the CEMP.
- Provide appropriate training on the CEMP to all employees, subcontractors, and visitors onsite.
- Comply with applicable regulations, licences, and permit conditions.
- Work with the EM to identify the most suitable BMPs for each work activity, and implement these BMPs.
- Communicate with the EM to confirm CEMP compliance and responsible environmental protection.
- Identify imminent threats to the environment, and respond to EM-identified environmental issues and concerns in a timely manner.
- Rectify any issues when out of compliance with the CEMP, as soon as reasonably possible and ideally within 24 hours of notification from the EM.
4.0 REGULATORY FRAMEWORK

The following section describes the regulatory framework under which construction work onsite is to be completed. As the Project is on federal land (administered by VFPA), federal and VFPA regulations and requirements are applicable at the Project site. Environmental legislation and associated requirements that are applicable to the Project are described in Table 4-1. The Contractor shall have all required permits necessary to undertake the construction, and shall comply with the terms and conditions of these permits.
<table>
<thead>
<tr>
<th>Act, Regulation or Bylaw</th>
<th>Description</th>
<th>Applicability to the Project and Mitigative Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fisheries Act (RSC 1985, c. F-14)</strong></td>
<td>DFO is the lead federal agency in managing Canada’s fisheries and safeguarding waters that support the fisheries. The <em>Fisheries Act</em> requires that projects avoid causing serious harm to fish unless authorised by the Minister of DFO. Under section 35(2) of the <em>Fisheries Act</em>, an Authorisation from DFO is required to carry out any work, undertaking, or activity that could result in serious harm to fish that are part of a commercial, recreational, and Aboriginal fishery, or to fish that support such a fishery. Section 36 of the <em>Fisheries Act</em> is administered by Environment and Climate Change Canada (ECCC), and prohibits the deposit of deleterious substances into water frequented by fish (unless authorised by regulation).</td>
<td>A <em>Fisheries Act</em> Authorisation is not anticipated for this Project. Provided that the proposed mitigation measures are implemented, the Project is unlikely to cause serious harm to fish. A Request for Review will be submitted for the inwater works associated with the Project (i.e., transfer tower 4 footings and changes to upland ditches). The Project will not discharge materials into the aquatic environment that are deleterious to fish. Discharges will meet the <em>British Columbia Approved Water Quality Guidelines (Criteria): January 2017 Edition</em> (MOE 2017).</td>
</tr>
<tr>
<td><strong>Species at Risk Act (SC 2002, c. 29). ECCC</strong></td>
<td>The <em>Species at Risk Act</em> (SARA) is intended to protect extirpated, endangered, or threatened plant and animal species, and manage species of special concern to prevent them from becoming endangered or threatened. Once a species is listed under SARA, it becomes illegal to kill, harass, capture, or harm it in any way. Critical habitat for the survival and recovery of a listed species is also protected.</td>
<td>Critical habitat for streambank lupine (a plant species at risk) will be altered through the construction of the terminal rail loop. A SARA Section 73 is required for Project construction and a permit application has been submitted. The Project will comply with SARA permit conditions.</td>
</tr>
<tr>
<td><strong>Migratory Birds Convention Act (SC 1994, c. 22) ECCC</strong></td>
<td>The <em>Migratory Birds Convention Act</em> is intended to protect and conserve migratory birds, as individuals and populations, and their nests. Prohibited activities under the Act include disturbance, destruction, or taking a nest or egg of a migratory bird, and all activities that are harmful to migratory birds, their eggs, or their nests. Activities that adversely affect migratory birds and / or their nests and eggs can result in violations of the Act.</td>
<td>Construction activities will be planned and timed to avoid effects on migratory birds during nesting season.</td>
</tr>
<tr>
<td><strong>Canada Shipping Act, 2001 (SC 2001, c.26). Transport Canada</strong></td>
<td>The <em>Canada Shipping Act</em> is intended to protect the marine environment from damage due to navigation and shipping activities.</td>
<td>The Act is applicable to Project vessels where the shipping and receiving of goods/materials are expected.</td>
</tr>
<tr>
<td>Act, Regulation or Bylaw</td>
<td>Description</td>
<td>Applicability to the Project and Mitigative Measures</td>
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<tr>
<td>Transportation of Dangerous Goods Act (SC 1992, c.34)</td>
<td>The <em>Transportation of Dangerous Goods Act</em> promotes public safety in the transportation of dangerous goods, or when handling, loading, unloading, packing, or unpacking of dangerous goods in a means of containment during transportation via road, rail, air, or water (marine).</td>
<td>The Act is applicable to any transportation of dangerous good related to the Project (potential sources include hazardous waste from spills, contaminated building material, etc.).</td>
</tr>
<tr>
<td>Transport Canada</td>
<td></td>
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</tr>
<tr>
<td>Navigation Protection Act (RSC 1985, c. N-22)</td>
<td>The <em>Navigation Protection Act</em> (NPA) authorises and regulates interferences with the public right of navigation. A primary purpose of the NPA is to regulate works and obstructions that may interfere with navigation in Canada’s busiest navigable waters (i.e., scheduled waterways). Under the NPA, Notice to the Minister (i.e. the Minister of Transport) must be submitted by any owner who constructs, places, alters, repairs, rebuilds, removes, or decommissions a work in, on, over, under, through, or across any navigable water that is included on the List of Scheduled Waters.</td>
<td>The Project is located on the Fraser River, a scheduled waterway under the NPA and within VFPA jurisdiction. Although exempt from Ministerial review under the NPA, a Notice of Works is still required to be submitted to the Minister via Transport Canada for construction of transfer tower 4.</td>
</tr>
<tr>
<td>Transport Canada</td>
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<tr>
<td>Railway Safety Act (RSC 1985, c. 32 (4th Supplement))</td>
<td>Notice of works, in accordance with the Notice of Railway Works Regulations, must be given under section 8 of the <em>Railway Safety Act</em> for modifications to railway works. This notice is to be given at least 60 days prior to construction, and must include a period of at least 60 days during which objections may be filed. The work may proceed if no safety objections are received. If objections are received, Transport Canada may intervene if parties cannot resolve the matter.</td>
<td>The <em>Railway Safety Act</em> is only relevant to mainline rail (i.e., Canada Nation and Burlington Northern Santa Fe mainline tracks at the Project site). During construction, existing railway track will be removed and additional railway tracks will be built. If the mainline is altered, a notice of works will be required.</td>
</tr>
<tr>
<td>Transport Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>British Columbia Ministry of Environment and Climate Change Strategy, Technical Guidance Document #1: Site Characterization and Confirmation Testing (TG1)</td>
<td>This document contains guidance for investigating and characterizing fill and soil that may be contaminated.</td>
<td></td>
</tr>
<tr>
<td>Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products. 2003</td>
<td>This document has been prepared for owners of storage tank systems, the petroleum marketing and distribution industry, and federal, provincial, and territorial departments which have the authority to regulate storage tanks containing petroleum or allied petroleum products</td>
<td>Part 9 of this document contains the requirements for the closure and withdrawal from service of storage tank systems, either temporarily or permanently. Provisions for tank removal and disposal are provided to ensure that abandoned storage tanks do not cause environmental problems.</td>
</tr>
<tr>
<td>Canadian Council of Ministers of the Environment</td>
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</tbody>
</table>
5.0 PROJECT MITIGATION MEASURES AND ENVIRONMENTAL SPECIFICATIONS

As per VFPA’s CEMP Guidelines, this section describes proposed mitigation measures, guidelines, and management practices that will be applied during the Project’s construction and operation phases. The level of detail provided for each component has been scaled to the size and complexity of the Project and the potential for Project-related activities to generate effects.

Key performance indicators related to the component plans below will be developed for the Project during the contracting phase, and will be designed to measure the implementation of key environmental requirements. Typically expressed as measurable environmental targets, key performance indicators will be quantitative where possible, and will inform any monitoring and auditing tasks conducted for the project.

5.1 GENERAL PRACTICES

All work onsite will be conducted in a manner that limits adverse effects to the public and environment; and will be consistent with accepted industry standards, BMPs, and applicable regulations. The Contractor shall implement the following general practices during construction:

- Require all site personnel, employees, contractors, and subcontractors to review the CEMP and supporting documents, be familiar with its components, and comply with those components that are applicable to their work.
- Include environmental protection measures in each work plan to proactively mitigate the potential for adverse effects on the environment.
- Keep appropriate supplies (e.g., spill kits, first-aid equipment, erosion and sediment control supplies and equipment) in accessible locations onsite to respond to emergencies in a timely manner, and conduct appropriate training for employees of the site in the use of this equipment. Maintain and keep training up to date as the Project progresses with each new phase.
- Schedule work, as much as possible, to avoid adverse effects to the public and environment (e.g., avoid migratory bird nesting periods, adhere to least risk fisheries windows, avoid loud and noisy construction activities at night, plan work to minimise adverse weather-related stormwater runoff, etc.).
- Reduce light spill by pointing lights downward and placing task lighting as close to the work area as possible.
- Review the work tasks weekly with the EM to confirm compliance with the CEMP, BMPs, and applicable regulations and standards, especially when transitioning to new phases of the Project.

5.2 SITE ACCESS, MOBILISATION, AND LAYDOWN AREAS

Project-related traffic movements will interact with public roads and local traffic, and may create challenges if not properly managed. The majority of the materials required for construction will be transported to the Project site via trucks, with the exception of large-dimension materials (e.g., shiploader, reclaimer, modules and pre-assemblies), which will be delivered to the Project site via barge. Equipment and supplies will be
brought to the site while any debris, wastes, and affected soil will be removed to appropriately licensed facilities.

The proposed vehicular access to the Project is from Timberland Road to Robson Road, entering the Project site via the Elevator Road security gate. Access to the Project is limited due to marine port security restrictions required for VFPA lands and the existing FSD operations. Access will be accordingly planned for Project personnel via the Vehicle Control System gate.

- A laydown area has been identified for use to minimise traffic in the active construction work areas and active port operations. The laydown area for the Project is anticipated to be approximately 140 m by 180 m and located west of the potash storage building, as shown in Figure 5-1.

The Contractor shall implement the following mitigation measures during construction:

- Develop and implement a detailed Traffic Management Plan, including traffic control measures and communications plans.
- Notify community and stakeholders anticipated to be affected by Project traffic about Project access requirements and expected traffic effects. Notification shall occur through the process outlined in the Traffic Management Plan.
- Follow the applicable laws and regulations regarding the loading and transport of materials, (e.g., Transportation of Dangerous Goods Act), and any other applicable regulations.
Figure 5-1 Proposed Laydown Area and Excavations
5.3 **AIR QUALITY**

The objective of air quality management during construction is to minimise air emissions associated with Project-related equipment, pre-load, earthworks, and some fabrication and coating activities. Construction-related effects from emissions are anticipated to be typically of short duration but still have the potential to affect local air quality. Air emissions generated during construction of the Project will consist of vehicle/equipment exhaust, dust, and other emissions associated with onsite activities.

The Contractor shall implement the following mitigation measures to control and minimise air emissions during construction:

- Turn equipment and vehicles off when not in use, and idle only if used within a reasonable amount of time (e.g., 5 minutes or less). Exceptions include mobile light plants for site lighting, mobile dewatering equipment, and any health and safety equipment required for safe operation of the site during construction.

- Keep all construction equipment and vehicles well maintained. Complete maintenance logs and daily logs following inspections to document that equipment and vehicles are in good working order.

- Monitor and manage dust-generating activities (e.g., earthworks, pre-loading) during dry periods and periods of high wind to avoid generation and transport of dust offsite. Following VFPA’s acceptance of the suppression agent and application method prior to its use onsite, use suppression agents (e.g., watering and covering) when work cannot be rescheduled to a more appropriate time. Contain and treat run-off due to use of suppression agents as necessary;

- Stockpile soil in an appropriate laydown area, cover with polyurethane sheeting, and secure active stockpiles (e.g., covered with anchored polyurethane sheet) at the end of each shift. If stockpiles will be left inactive for several weeks or more, the method of securing them shall be appropriate for preventing sedimentation and weed establishment (e.g., hydrosedding or more permanent cover).

- Cover all trucks leaving the site with soil or pre-load to prevent dust generation and loose gravel release to the roadway.

- Complete regular site cleaning with a water truck and sweeper to keep the onsite roads clear of dust-generating material.

- Wash truck wheels prior to leaving the site to avoid tracking material (i.e. soil, debris, wastes) offsite.

5.4 **NOISE AND VIBRATION**

The objective of developing a Noise and Vibration Management Plan is to minimise noise and vibration associated with construction activities. The noise assessment completed for the Project ([Attachment 4.2-P of the Application](#)) focused on determining the change in noise levels from existing conditions at sensitive receptors. During construction, noise and vibration will result from various activities, including impact pile-driving, demolition (jackhammer and concrete saw), and building construction. Potential effects may include disturbance of nearby residents. Measures described below for mitigating and managing noise and vibrations were derived from the noise assessment.
The Contractor shall implement the following mitigation measures to control and minimise noise during construction:

- Select construction equipment to minimise noise, where possible. For example:
  - Where practical, use diamond saws to cut concrete rather than jackhammers.
- For impact pile driving:
  - Use vibratory drivers wherever practical.
  - Use hydraulic impact hammers instead of diesel hammers.
  - Use cast-in-place concrete piles instead of steel piles where practical.
  - Construct bored piles by augering.
- Use equipment or processes that have additional noise control features, including high-performance mufflers and enclosures on diesel- or gas-powered equipment or exhaust silencers on air tools.
- Regularly maintain all equipment, including lubricating applicable components and replacing worn parts.
- Operate equipment at minimum engine speeds consistent with effective operation.
- Educate construction personnel (site supervisors, foremen, equipment operators, etc.) regarding particular noise issues and train workers to operate equipment as quietly as possible.
- Avoid unnecessary idling, revving, use of airbrakes, and banging of tail gates and front-end loader buckets.
- Turn off equipment when not in use.
- Where practicable, locate stationary work stations as far away as possible from noise-sensitive receivers.
- Schedule construction activities and limit equipment usage times to minimise noise when operating near sensitive receivers.
- Where possible, schedule periods of respite during noisy construction activities.
- Develop noise complaint procedures including providing details relating to how complaints will be documented and investigated as well as setting target timeframes for responding to complaints.
- Develop and implement a Community Consultation and Communication Plan to ensure the community is aware of and prepared for scheduled construction activities.
- Plan truck traffic routes to minimise idling time, reversing, and driving distances.

5.5 Machinery and Equipment

As detailed below, various machinery and equipment will be used to complete Project construction tasks including excavation, stockpiling, transportation, and construction. The measures outlined in this section will reduce Project-related effects on air quality (through minimising diesel emissions) and biophysical
environment (through minimising spills of fuel and other hydrocarbons into the environment). Upland and shore-side Project-related construction activities will include the following types of equipment:

- Excavators
- Cranes
- Circular saw
- Dump trucks
- Loader
- Forklift
- Concrete truck, pump truck, and paver
- Plate compactor
- Haul truck
- Bulldozer
- Roller
- Tamper
- Self-propelled modular transporter
- Light-duty truck

Marine equipment is detailed in Section 5.10.

The Contractor shall implement the following mitigation measures for machinery and equipment during construction:

- Comply with VFPA’s Non-road Diesel Emissions program to reduce diesel particulate matter emissions from non-road equipment. Note that VFPA charges fees for use of non-certified (Tier 0) and Tier 1 non-road diesel equipment operated on VFPA lands.
- Keep equipment in good working order with no leaks, excess oil, or grease, and complete and document daily checks on each piece of equipment prior to operation.
- Provide the machinery and equipment maintenance log to the EM, review performance on a regular basis, and make improvements to reliability, safety, and working condition.
- Refuel equipment at least 30 m from any water body, drainage ditch, or storm sewer, where possible. Complete all refueling with a spill kit in the immediate vicinity, using site personnel trained in the use of spill kits.
- Keep spill kits readily available onsite at all times and well stocked with a list of materials included in each kit.
- Train site personnel in the use of and locations of spill kits.

5.6 CONCRETE WORKS AND GROUTING

Concrete and grouting will be completed during Project construction for activities including building and structure foundations, dumper pit, and conveyor tunnel. Concrete will likely be batched offsite and transported to the Project site in mixer trucks. Concrete works and grouting management will prevent untreated concrete and grout effluent from reaching and adversely affecting the receiving aquatic environment.

The Contractor shall implement the following mitigation measures for cast-in-place concrete works during construction:
• Isolate all concrete, cement, or grout work from any flowing water and waterbodies for a minimum of 48 hours after placement.

• Prevent any water that contacts uncured or partly cured concrete during activities like wet curing or equipment washing from directly or indirectly entering any watercourse, including drainage ditches.

• Do not deposit, directly or indirectly, concrete, cement, mortars, and other Portland cement or lime-containing construction materials into or about any watercourse.

• Provide containment facilities for the wash-out water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment.

• Keep a carbon dioxide tank with regulator, hose, and gas diffuser readily available to neutralise concrete-affected effluent that could reach fish-bearing waters (e.g., via drains), and train workers in use of this equipment.

5.7 CONTAMINATED SOIL AND GROUNDWATER MANAGEMENT

Pre-existing contaminated soil has not been identified within the Project site; however, areas of unforeseen contamination (i.e., areas of unidentified soil contamination or debris) may be encountered during construction or excavation activities. In addition, contamination may occur during construction due to spills or improper handling of hazardous materials. For further information on the management of contaminated soil or groundwater, including remediation options, refer to the Soil and Groundwater Management Plan for the site (Appendix A). For further information on the management of spill waste materials generated during construction, refer to the Hazardous Materials Management Plan (Section 5.15) and the Spill Response Plan (Section 6.3).

5.8 UNDERGROUND STORAGE TANK (UST) DECOMMISSIONING AND REMOVAL

As outlined in the Permit application report (Section 2.1.1.1), there are three (3) underground storage tanks (USTs) containing diesel and gasoline (associated with current FSD operations) that will be decommissioned and removed as part of the Project. The three USTs are located southeast of Shed 5 / Diesel Shop.

The CCME Guidelines are applicable to the media that remains at the Project site following the removal of the USTs. As part of the Project some soils excavated may require additional management off-site (i.e., to a provincially licensed facility). Therefore, the standards contained in the BC Environmental Management Act (EMA) and the associated Contaminated Sites Regulation (CSR) will be used to evaluate the site data for comparison and soil management purposes.

Prior to any excavation activities, a ground penetrating radar (GPR) survey will be completed to confirm tank orientation, extents, and depth. The location of the UST will be mapped as well as outlined with paint in the field for future reference. The tanks(s) and associated piping will be decommissioned and removed per the requirements outlined in the CCME (2003) guidance document.
The EM will collect confirmatory soil samples from the walls and base of each excavation upon completion of the excavation. The procedure for confirmatory soil sampling is outlined in Appendix A Soil and Groundwater Management Plan.

5.9 **EROSION AND SEDIMENT CONTROL**

Erosion and sediment control will be implemented onsite to isolate the work area, minimise soil disturbance, and avoid or minimise any potential sediment-laden runoff during construction activities from entering a waterbody or encroaching onto adjacent properties or roadways.

The Contractor shall prepare site-specific environmental protection plans that describe the erosion and sediment control methods that will be implemented, maintained, and inspected when Project activities such as clearing vegetation, moving soil, excavating, placing fill or pre-load, and other activities have the potential to disturb ground or contribute sediments to nearby water bodies. The Contractor shall communicate the concept of "no erosion = no sedimentation" to Project workers.

The Contractor shall implement the following mitigation measures to prevent erosion and manage sediment during construction, as determined with the EM to be applicable:

- Give priority to erosion source control techniques over sediment control techniques as source control of erosion is more effective and less expensive than sediment control.
- Apply erosion and sediment control measures as soon as soil disturbance or vegetation clearing has occurred. Erosion control measures include but are not limited to: slope texturing, straw mulching, erosion control blankets, straw wattles, bioengineering, check dams, turf reinforcement mats, rock-lined channels, seeds, and polyethylene sheeting.
- Install sediment control measures in sedimentation-prone areas. Measures include: constructing sediment fences, installing French drains, using dry wells, working with non-woven geotextiles, pumping and diverting, and using settlement ponds and basins.
- Make erosion and sediment control materials available and easily accessible for use onsite.
- Train onsite staff in the use, installation, and maintenance of erosion and sediment control measures. The EM will review installation and approve placement and use prior to work beginning.
- Where possible, schedule earthworks to occur during dry weather. When significant wet weather is predicted or encountered, erect additional control measures promptly to minimise erosion potential.
- Minimise areas of exposed soil at any one time by:
  - planning and phasing construction activities
  - retaining vegetation as much as possible
  - stabilising any exposed soils as soon as possible using temporary erosion control measures or revegetating (if during the appropriate time of year).
Remove and dispose of temporary erosion and sediment control measures when no longer required, as determined by the EM.

Do not discharge petroleum hydrocarbons, solvents, heavy metal particulate, concrete, etc. or any material that could be deemed harmful to fish under the Fisheries Act into the environment. If water is discharged from the Project, the EM will verify that the water meets the appropriate water quality standards (civic, provincial, municipal, federal).

Avoid tracking mud or dust onto civic lands or streets (e.g., through the use of wheel washes).

Erosion and sediment control measures specific to the management of contamination are described in the Soil and Groundwater Management Plan in Appendix A.

5.10 MARINE WORKS

The aquatics resources assessment completed for the Project (Attachment 4.2-W of the Application) is focused on fish and fish habitat, benthic invertebrates, marine mammals, species of conservation concern, and commercial, recreational, and Aboriginal (CRA) fisheries. The Fraser River shoreline bordering the Project is characterised by the Fraser River Estuary Management Program as "green coded" or low productivity for fish habitat (FREMP 2015). Gunderson Slough, located 165 m south of the Project site, is a large backwater feature in the Fraser River with high-value rearing habitat for out-migrating juvenile Pacific salmon. The Bekaert South Ditch parallels the north side of Elevator Road and appears to be hydraulically connected to Gunderson Slough. The lower Fraser River is known to contain valuable habitat for both juvenile and adult white sturgeon (Glova et al. 2008, 2009, 2010; Neufeld et al. 2010; COSEWIC 2012; Ghilarducci & Reeve 2012). Areas around Annacis Island, downstream of the Project, were frequently found to have juvenile sturgeon through the summer months (Glova et al. 2010).

Project-related activities in the marine environment will include vessel-based transport of large structures (e.g., shiploader) and removal of riprap and pile driving for the foundation of the transfer tower closest to the shiploader. Construction equipment required for these activities is anticipated to include a flat-top barge, heavy-lift vessel, tugs, vibratory and/or impact hammer pile drivers, and a crane-suspended, down-hoe vibrator for pile driving. Management of marine works by the Contractor will minimise potential effects to aquatic resources during marine-based construction activities.

The Contractor shall plan and implement the following mitigation measures during construction:

- Comply with the requirements of the federal Fisheries Act, and all other applicable laws, legislation, and best management practices.
- Submit Project notifications/change approvals under the Marine Act before works begin.
- Conduct construction activities within the Fraser River during the least-risk fisheries work window specified by Fisheries and Oceans Canada (DFO) for the region unless otherwise agreed upon by DFO. The prescribed work window for the Project area is June 16 to February 28 (DFO 2014).
Adhere to the following BMPs and guidelines:

- Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2016)
- Fisheries Productivity Investment Policy: A Proponent’s Guide to Offsetting (DFO 2013)
- Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1993)
- Develop with Care 2012: Environmental Guidelines for Urban and Rural Land Development in British Columbia (MOE 2012)

Conduct pile driving from land-based equipment whenever possible.

Avoid unnecessary idling of marine-based equipment.

Commence in-water activities slowly to encourage motile species (e.g., fish, seals, and sealions) to leave the construction area.

Undertake the following measures during pile driving:

- Use a vibratory hammer for pile driving, wherever feasible, as this method produces lower sound levels than the conventional impact driver. During pile driving, consider using bubble curtains (i.e., to dampen overpressure waves and reduce sound levels emitted within the Fraser River).
- Designate a marine mammal observer (i.e., an AQP) during pile driving who shall have the authority to stop work when whales, dolphins, porpoises, or sea lions are within a 1,000-m radius (safety zone) of impact pile-driving operations. Work may resume when marine mammals have not been observed for 10 minutes, or have been observed leaving the safety zone.
- In conjunction with marine mammal monitoring, retain an AQP to undertake hydro-acoustic monitoring of underwater noise levels associated with pile-driving activities to prevent harmful in-water noise levels.
  - Do not exceed 206 decibels (dB) per single strike immediately adjacent to pile driving activities to avoid injury to fish.
  - If marine mammals are present, do not exceed 160 dB at distances greater than 1,000 m of pile-driving activities to avoid injury to marine mammals.
  - Keep a bubble curtain onsite while driving piles, and deploy if acoustic thresholds are exceeded.

Undertake the following measures related to vessel use:

- Coordinate vessel movements outside of FSD to reduce conflict with fishing vessels engaged in net fisheries.
- Abide by the Canada Shipping Act, and associated regulations, including the Collision Regulations, Marine Communication Regulation, and the Vessel Traffic Service Zone Regulation.
Broadcast vessel movements on VHF channel 74.

Take early and substantial action to keep clear of all other vessels and fishing gear including reducing speeds around fishing vessels to prevent danger or injury by bow wave or wash to such craft (VFPA 2016).

Consider commercial, recreational, and Aboriginal net fishery openings in Fisheries Management Area 29-13 of the Fraser River in scheduling of vessel movements. As directed by BHP and VFPA, engage with Aboriginal and stakeholder groups to clarify critical timing and location of fishing vessels with shipping to and from the Project site.

5.11 MANAGEMENT OF VEGETATION, WILDLIFE, AND UPLAND AQUATICS

The terrestrial resource assessment (Attachment 4.2-X of the Application) describes existing vegetation and wildlife and upland habitat onsite. Most of the site (approximately 98 percent (%)) has been developed and is currently paved and used for industrial or port terminal activities, and therefore provides little habitat for native plant and wildlife species. Wildlife species likely to be present are relatively mobile species and species with a high tolerance for human-related activities. A potential bald eagle nest is located in a strip of black cottonwood trees approximately 100 m north of the PDA and Shed 6. The majority of the vegetated areas are sparsely vegetated and dominated by non-native and invasive plant species. Measures described below for mitigating and managing effects to vegetation and wildlife were derived from the terrestrial resource assessment.

The Contractor shall implement the following mitigation measures to manage vegetation during construction:

- Stage and minimise clearing to the extent practical, and avoid ground disturbance where possible.
- Survey and clearly demarcate (e.g., flagged) clearing limits in the field prior to undertaking any clearing work to minimise the amount of vegetation removal.
- Implement an invasive species management plan with the following general parameters:
  - Dispose of invasive plant material appropriately.
  - Remove invasive plant species prior to fruit / seed pod development to prevent spread and regrowth of seeds.
  - Inspect vehicles for plant material prior to entering site, and use truck wash station to prevent the spread of invasive plant species.
  - Ensure any soil or fill coming onto the site is free of noxious weeds.

The Contractor shall implement the following mitigation measures to manage wildlife during construction:

- Implement the following nesting bird mitigation measures:
  - Schedule vegetation removal to occur during the following least risk work windows to avoid contravention of the Wildlife Act and the Migratory Birds Convention Act, to the extent practical (August 15 to March 15).
Conduct pre-clearing nest surveys if vegetation removal / building demolition must occur during the nesting window. Pre-clearing nest surveys shall be conducted by an AQP and in accordance with the *Active Migratory Bird Nest Surveys* (CWS 2010) and the *Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia* (MOE 2013). If an active nest is located, the AQP shall propose appropriate mitigation measures (e.g., 50-m nest buffers for songbirds).

Monitor active raptor nests prior to construction to establish nest status. Monitoring shall be conducted by the AQP to determine if Project activities are causing substantial disturbance. The AQP shall propose appropriate mitigation to reduce sensory effect on nesting birds.

- Inspect steep-walled excavations, if they occur onsite, to protect against wildlife entrapment. If wildlife is in the excavation and cannot escape unimpeded, the AQP shall implement measures to confirm the safe removal of wildlife.
- Inform the EM immediately if mammal presence is observed during building demolition. The AQP will propose appropriate mitigation measures to confirm the safe removal of wildlife.
- Keep work areas clear of wildlife attractants (e.g., garbage).

The Contractor shall implement the following mitigation measures to manage upland aquatics during construction:

- Salvage amphibians prior to infilling Robson Ditch, Unnamed Ditch, and Bekaert South Ditch, in accordance with the *Best Management Practices for Amphibian and Reptile Salvages in British Columbia* (MFLNRO 2016) to demonstrate compliance the *Wildlife Act*. Salvaging shall be conducted by an AQP. Northwestern salamander could be present year-round in ditches. Due to the anticipated conditions, salvage methods will primarily focus on traps and visual observations during dewatering.
- Restore disturbed areas along ditches, where practical, as soon as possible after disturbance.
- Conduct a salvage of fish on any wetted channel prior to instream work. An AQP shall monitor water drawdown of ditches to confirm that no fish are present.
- Schedule any ditch infilling or removal within DFO’s Least Risk Timing Periods of June 16 to February 28 (if fish are present, or potentially present), or when ditches are driest. Prior to infilling, pump water from the ditches to an approved vegetated area for infiltration.
- Test any contact water to ensure that it meets water quality guidelines (e.g., in adherence to the BC *Water Quality Guidelines* (Criteria): January 2017 Edition (MOE 2017)) prior to being discharged back into the environment.

### 5.12 SENSITIVE HABITAT FEATURES AND SPECIES

Sensitive habitat features and species will be managed by the Contractor during construction to minimise adverse effects on sensitive habitat features and species due to the Project. The Project site contains critical habitat for streambank lupine, a plant species at risk, as designated under the *Species at Risk Act* (SARA). Streambank lupine (*Lupinus rivularis*) critical habitat is shown on Figure 5-2. The Contractor shall comply
with additional conditions relating to streambank lupine as may be specified in the SARA permit that will be obtained by the Owner prior to construction. Mitigation measures are identified below.

In addition, the Contractor shall notify the EM immediately if sensitive species or encroachment on sensitive habitats are observed during construction and the EM may identify additional mitigation as appropriate to the activity and sensitive feature encountered.

The Contractor shall implement the following measures, in accordance with the Recovery Plan for Streambank Lupine (*Lupinus rivularis*) in BC (SLRT 2014):

- Inform workers on the potential presence of streambank lupine and train workers in the recognition of the species.
- Flag and stake the construction zone in the streambank lupine critical habitat area to prevent accidental encroachment outside the construction zone.
- Should streambank lupine be identified onsite during construction, notify a BHP representative immediately for further direction.
- Avoid the use of chemical herbicides for vegetation control in areas where streambank lupine could be either directly or indirectly affected through wind drift.
- Undertake any maintenance activities on the railway in streambank lupine critical habitat following lupine seed set (typically July) (BC's Coast Region: Species and Ecosystems of Conservation Concern 2010).
- Avoid storing or dumping of fill, construction materials, or garbage in the streambank lupine critical habitat area.
- Remove vegetation (trees and ground cover) in a manner to avoid the mixing of soils.
- Retain and separate top soils from the 0 to -3 centimetres (cm) and -3 cm to -6 cm layers excavated from the streambank lupine critical habitat area (to be used for offsite habitat enhancement).
- Comply with additional conditions relating to streambank lupine as may be specified in the SARA permit for the site.
This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report, i.e. it is intended to be used in conjunction with the scope of services and limits described therein.

All mapped features are approximate and should be used for discussion purposes only.

Sources
- PDA obtained from BHP Billiton Ref: 151951-03 G-S4-25 Rev D.pdf
- Streambank Lupine data provided by Government of Canada Environment and Climate Change Canada Open Government Web site - Map Open Canada's Data
- Imagery provided by Coomans - City of Surrey
5.13 ARCHAEOLOGICAL RESOURCES

Ground-disturbance activities shall be managed by the Contractor to prevent or mitigate adverse effects to archaeological resources during construction. Although the Project’s archaeological overview assessment (Attachment 4.2-U of the Application) found no archaeological resources at the Project site, a portion of the Project footprint has been identified as having moderate to high potential for containing archaeological resources. Archaeological monitoring is recommended for all ground disturbances deeper than 2 m below the current surface (see Table 5-1). Monitoring should continue until maximum excavation depth is reached or a minimum of 50 cm of non-organic, sterile sediments have been observed by the supervising archaeologist on site, whichever occurs first. Once a minimum of 50 cm of non-organic, sterile sediments have been observed by the supervising archaeologist on-site monitoring can be discontinued. The location of excavations to be monitored, along with associated excavation depths, is shown in Figure 5-1.

Table 5-1 Excavation to be Monitored

<table>
<thead>
<tr>
<th>Structure to be Excavated</th>
<th>Depth of Excavation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm and sanitary sewer (east side of storage building)</td>
<td>2.25 m</td>
</tr>
<tr>
<td>Storm sewer (west side of storage building)</td>
<td>2.7 m</td>
</tr>
<tr>
<td>Rail car unloading station</td>
<td>12.20 m</td>
</tr>
</tbody>
</table>

Source: Drawing 101051-03-G-SK-106 Rev A

Note: A densified zone approximately 15 m deep will be created along each side of the storage building using stone columns. Excavation will only occur in the top 1.8 m therefore monitoring is not required for storage building excavation.

The Contractor shall implement procedures for the inadvertent discovery of heritage resources (i.e., a chance find) in accordance with the Chance Find Procedure as provided in Appendix B of this CEMP.

5.14 FUEL MANAGEMENT PLAN

The Contractor shall manage fuel handling and storage to minimise potential risks of fuels entering the terrestrial or marine management. Spill response measures are provided in Section 6.3. The Contractor shall conduct refueling at the designated locations only during construction, and shall manage all fuel-related activities to minimise accidental fuel releases. At a minimum, the Contractor shall employ the following practices during site work:

- Keep all equipment and vehicles in good working order with no leaks, excess oil, or grease, and daily checks completed and recorded on each piece of equipment prior to operation.
- Locate refueling of equipment at least 30 m from any water body, drainage ditch, or storm sewer, where possible. Complete all refueling with a spill kit in the immediate vicinity.
• Keep spill kits readily available onsite at all times and well stocked with a list of materials included in each kit.

• Train all site personnel in the use and the locations of the spill kits in case of a release onsite.

• Store all fuel at least 30 m from any water body, drainage ditch, or storm sewer.

• Ensure that fuel storage containers include a secondary containment capable of containing 110% of the volume of the largest tank. Design the containment area so that precipitation does not accumulate and the containment remains effective in all weather conditions and seasons.

• Clearly identify and label fixed fuel storage and dispensing locations.

• Prohibit smoking in and around fuel storage and dispensing facilities and have a fire extinguisher in an easily accessible location.

• Transport fuel to and on the site in accordance with the Federal Transportation of Dangerous Goods Act and the Provincial Transport of Dangerous Goods Act.

• Inspect and maintain fuel storage areas in accordance with a regular schedule.

• Report any release of fuel to the EM and the Incident Commander as outlined in Section 6.0.

• Ban the use of trigger locks for fueling nozzles on site.

5.15 WASTE MANAGEMENT

Waste management is used to minimise waste on the Project site during the construction. Waste that may be generated include demolition wastes, construction wastes, food, and other waste material. The management of hazardous wastes is described in Section 5.15.

The Contractor shall implement the following mitigation measures during construction:

• Label and dispose of all waste generated onsite appropriately.

• Identify and implement waste reduction initiatives and measures.

• Maintain site cleanliness (i.e., good housekeeping) by cleaning up construction debris, garbage, and other non-hazardous solid waste materials on a regular basis.

• Provide clearly labeled waste and recycling containers. Require workers to segregate their waste into these containers.

• Provide site-specific training on relevant waste management strategies and expectations.

• Store waste in designated locations only more than 30 m from waterbodies.

• Ensure a fire extinguisher is available in an easily accessible location.

• Ensure that catch basins in proximity to waste storage locations are protected and the protection is routinely inspected and maintained.

• Remove food and/or domestic waste weekly and store in odor-tight and wildlife-proof containers.

• Isolate waste concrete (e.g., unused concrete during concrete pours) from water and left to harden, prior to disposal.

• Dispose of contact water only if:
· It is non-contaminated and meets applicable standards or guidelines (e.g., BC Water Quality Guidelines at the point of discharge) or
· Its disposal is authorised by a regulation, code of practice, or permit.

· Dispose of waste to recycling or disposal facilities that are permitted to accept these wastes.
· Undertake waste removal and disposal at approved offsite facilities at a sufficient frequency (before onsite containment facilities become overfilled).
· Dispose and transport all waste following the applicable regulations.

5.16 HAZARDOUS MATERIALS MANAGEMENT

The objective of hazardous materials management during construction is to manage the materials in a way that avoids potential effects on human health and the environment and is compliant with environmental legislation. Hazardous materials are defined by the BC Environmental Management Act - Hazardous Waste Regulation (referred to below as the Hazardous Waste Regulation) and include dangerous goods and wastes as defined by the Transportation of Dangerous Goods Act. Hazardous materials may include demolition waste and general construction waste generated during construction.

5.16.1 General Hazardous Materials Management

The Contractor shall implement the following mitigation measures to manage hazardous materials encountered or generated during general construction:

· Store hazardous waste materials in designated, secure areas with secondary containment protected from the weather and at least 30 m away from any waterbodies.
· Construct secondary containment to be impervious with sufficient capacity to hold the larger of: 110% of the largest volume of free liquid in any container, or 125% of the total volume of free liquid in storage.
· Place clearly labeled spill kits and personal protective equipment (PPE) to be easily accessible and clearly visible in hazardous material storage and handling areas. Size the spill kit to be large enough to adequately contain and clean up spills that could occur in that area.
· Store different types of hazardous waste (e.g., corrosive and flammable materials) separately.
· Store all hazardous waste in containers that comply with requirements of Workplace Hazardous Materials Information System including labeling and provision of Safety Data Sheets (SDSs).
· Prohibit the dilution, mixing, and disposal of hazardous waste with non-hazardous waste.
· Transport hazardous wastes by licensed transporters and dispose of them at facilities permitted to receive hazardous waste and in accordance with the Transport of Dangerous Goods Act and the Transportation of Dangerous Goods Act.
· Maintain and retain hazardous waste manifests as per legislative requirements, including an inventory of the type and amount of hazardous waste generated, stored, and transported offsite.
· Manifest all hazardous waste prior to removal from site.
· Require all facilities receiving wastes to provide their licences for acceptance of the material prior to transport of the material offsite.
Follow applicable provincial and federal regulations related to waste disposal and transport.

Note that if the Contractor is generating or storing hazardous waste in quantities exceeding the quantity requiring registration, the Contractor shall comply with the Hazardous Waste Regulation (e.g., Generator registration, etc.).

### 5.16.2 Hazardous Materials Management during Building Demolition

The Project includes demolition of onsite buildings and structures. A Pre-demolition Hazardous Materials Survey was completed as part of the Hazardous Materials Assessment (Attachment 4.1-A of the Application). The survey found asbestos-containing materials, lead paints, PCB-containing ballasts, lead, mercury, and stored chemicals associated with numerous buildings and structures at the site. Measures described below for managing hazardous materials were derived from the Pre-demolition Hazardous Materials Survey and the Hazardous Materials Assessment.

The Contractor shall implement the following mitigation measures to manage hazardous materials encountered during demolition:

- Retain a qualified contractor to conduct a hazardous materials inspection report and survey, should an unforeseen hazardous material be discovered during demolition.
- Undertake further identification and removal of hazardous materials as demolition is initiated, including assessment of other buildings or above/underground structures that will be demolished but have not yet been identified in the previous pre-demolition hazardous materials survey. For example, assess whether hazardous materials may be present (e.g., seals, coatings, or wraps for pipes, tanks, or bunkers) in underground structures slated for demolition, but have not been assessed.
- Retain a qualified hazardous materials abatement contractor to conduct the storage, handling, and recycle/disposal of hazardous building materials described in Sections 5.15.2.1 to 5.15.2.10 below.
  
  - For each hazardous material, the abatement contractor must determine and be responsible for assessing the risk; establishing an exposure control plan for the work; and providing submittals to applicable regulatory boards including Notice of Project for work involving asbestos, lead, mould, and site-specific work procedures.

#### 5.16.2.1 Asbestos-containing Materials

The Contractor shall:

- Complete asbestos assessment as recommended in the Pre-demolition Hazardous Materials Survey as demolition is initiated.
• Conduct further identification and removal of hazardous materials as they are encountered, especially in buildings or above/underground structures that may be demolished but have not yet been assessed.

• Remove and dispose of asbestos-containing materials in accordance with the Workers Compensation Board (WCB) Occupational Health and Safety (OHS) Regulation prior to demolition of a building.

• Dispose of asbestos-containing materials in accordance with the BC Environmental Management Act - Hazardous Waste Regulation.

5.16.2.2 Polychlorinated Biphenyl-containing Ballasts and Capacitors

The Contractor shall:

• Identify polychlorinated biphenyl (PCB) ballasts and capacitors prior to or in conjunction with building demolition, at a time when it becomes feasible to isolate electrical power and disassemble or disconnect the light fixtures.

• Remove the ballasts and capacitors identified as containing PCBs in accordance with the OHS Regulation and dispose of them in accordance with the Hazardous Waste Regulation.

5.16.2.3 Lead-based Paints and Lead Building Materials

The Contractor shall:

• Perform any Project work that may affect existing lead or potential lead-based paints and/or primers in accordance with the WCB OHS Regulation and Lead-Containing Paints and Coatings - Preventing Exposure in the Construction Industry (WCB 2011).

• Remove the base substrate material associated with lead paint removal intact, in accordance with the contractor-specific risk assessment and site-specific work procedures.

• Protect workers conducting the work and workers in close proximity to the work being performed with PPE as determined by the contractor's risk assessment and site-specific work procedures.

• Label lead-containing paints that remain attached to wood and/or other building materials as lead-based paints for transport to a licensed or approved disposal site or recycling facility.

• Inform representatives of the approved facility receiving the waste of the lead content of these materials. The representatives must agree to receiving these materials.

• Ensure that all waste materials containing lead-based paints are sampled intact, fastened directly to the base substrate, and representative of the waste stream created by demolition.

• Provide samples to the site receiving the waste representative that have been analysed utilising a Toxicity Characteristic Leachate Procedure test for lead to determine the potential for soil or groundwater contamination, if deemed necessary by the site receiving the waste (WCB 2017).

• Lead paints that are to be separated or removed from the building materials by means of sanding, scraping, abrading, blasting, etc. may become a hazardous waste, depending on lead concentrations and leachate results. These waste products, shall be disposed of in accordance with the Hazardous Waste Regulation.
Remove and recycle or dispose of the lead in bells of drain pipe, lead sleeves at toilets, and lead inserts or anchors prior to demolition of a building, in accordance with the Hazardous Waste Regulation.

5.16.2.4 Mercury

The Contractor shall remove the mercury containing thermostats and light tubes and bulbs prior to demolition of a building, and salvage, recycle, or dispose of them in accordance with the Hazardous Waste Regulation.

5.16.2.5 Abandoned Chemicals

The Contractor shall remove stored chemicals, ozone-depleting substances within refrigeration equipment, and radioactive equipment prior to building demolition, recycle or dispose of, in accordance with the Hazardous Waste Regulation.

5.16.2.6 Bird and Rodent Droppings

The Contractor shall:

- Remove bird and rodent droppings, which can cause infectious disease and/or respiratory disease in humans, as biohazardous waste in accordance with the WCB OSH Regulation, prior to unprotected trades performing work in or conducting selective demolition of the buildings.
- In lieu of removing droppings, workers shall wear respirators and protective clothing while in contaminated areas of the buildings, and while conducting selective demolition of the buildings.

5.16.2.7 Natural Gas

The Contractor shall ensure that the natural gas in piping is shut off and purged by a qualified trades person prior to work that would affect the gas, and prior to building demolition.

5.16.2.8 Mould

The Contractor shall:

- Remove and handle as biohazardous waste moulds and/or fungi that can cause infectious disease or respiratory disease in humans in accordance with the WCB OHS Regulation, prior to unprotected trades performing work in affected areas of the buildings. In lieu of removing moulds and fungi, workers shall wear respirators and protective clothing while in contaminated areas of the buildings.
- Remove mould attached to gypsum board to be recycled prior to building demolition in accordance with the WCB OHS Regulation. During the removal process and prior to the gypsum board being transported to the recycling facility, treat the gypsum board and mould with an approved bleaching agent (or equivalent) to destroy the mould.
• Dispose of mould that remains attached to building materials such as wood, metal, and concrete in a manner applicable to normal demolition waste. Workers conducting selective demolition of the building shall wear respirators and protective clothing while in contaminated areas of the buildings.

5.16.2.9 Non-asbestos Gypsum Board

The Contractor shall remove gypsum board with no asbestos finishes (a provincially regulated construction waste) prior to demolition of a building and recycle or dispose of in accordance with the Hazardous Waste Regulation.

5.16.2.10 Silica

The Contractor shall:

• Perform silica removal work during demolition in a controlled manner to avoid the release of crystalline silica dust where cementitious building materials are suspected of containing silica in crystalline form.

• Ensure that any cutting, drilling, or other disturbance to these building materials is conducted by trained personnel in accordance with the WCB OHS Regulation.

5.17 PRE-LOADING

Due to the depth of the compressible soils (to a depth of 45 m); the only feasible means to limit settlement is soil densification by pre-loading. Pre-loading is common practice in the region and pre-loading logistics are well developed. Soil densification by pre-loading is required to prepare the new potash storage building site. The existing ground surface will be pre-loaded with up to 500,000 cubic metres (m³) of clean material (e.g., Fraser River sand). The weight of the preload material will compress and densify the existing soils. Sand will be sourced from the annual Fraser River dredging program. A dredging contractor will pump the pre-load material on-shore to a designated pre-load area. Water will drain to local reservoir where it will be pumped back into the Fraser River after testing to confirm water quality meets discharge requirements. It is estimated that the pre-load material will remain in place for 6 to 12 months. Wick drains may be used to accelerate settlement. Once the required amount of ground settlement has been achieved, the pre-load material will be removed. The preload material will be moved to other areas at the terminal requiring preload, or will be sold and trucked from site. The proposed FSD pre-loading methodology is as follows:

• A perimeter dyke, perimeter swale, and dewatering reservoir will be constructed from soils excavated from below the proposed potash storage building. The dyke will be approximately 2.5 m high, and will retain the toe of the pre-load material. The perimeter swale will be less than 0.5 m deep, be located approximately 25 m from the toe of the pre-load material, and will intercept any seepage that escapes the perimeter dyke.

• An 800 mm diameter dredge line will be installed.

• A dewater pump (e.g., diesel, 800 hp) and line will be installed. The discharge line will be placed on the bottom of the river to ensure returned water is discharged in the most turbid layer of the
river, but will be placed to minimize erosion of the riverbed as per VFPA requirements. Sampling will take place at the discharge line. Similar operations in the Fraser River have not experienced any environmental issues with discharge quality.

- Construction of temporary facilities is estimated to require approximately seven working days.
- Once temporary facilities are in place, dredged sand will be placed hydraulically at a rate of approximately 11,000 to 13,000 m³/day. Based on similar historical experience, the river sand drains very quickly, and the dewatering reservoir will be sized based on their established historical requirements.
- Placement is estimated to take 30 to 40 working days.
- On completion of placement, temporary facilities are maintained for approximately one week to manage seepage, and removal of temporary facilities will take another seven working days.

5.18 STORMWATER OUTLET RECONSTRUCTION

The existing stormwater outlet may be damaged during berth seismic improvements therefore a new outlet will be installed once densification activities are completed. Design specifications and details of the existing stormwater outlet are unavailable. The detailed design and methods for the stormwater outlet reconstruction will be developed in the next phase of engineering and underground survey work, after additional exploration has occurred.

- The stormwater outlet near berth 9 is the only portion of the stormwater system being modified. Based on current understanding, the construction plan for the reconstruction of the stormwater outlet is as follows: Pre-fabricate a replacement section of the outlet, assuming that approximately 40 m of existing outlet will be replaced, including the final catch basin ahead of the outlet.
- Schedule seismic improvements at Berth 9 for a low precipitation period, where possible.
- Install temporary stormwater detention and/or pumping prior to initiation of seismic improvements, to allow for potential stormwater flows while seismic improvements are underway, and during demolition of the existing stormwater outlet.
- Expose the existing stormwater outlet, following sediment and erosion control plans outlined in Section 5.9 as determined applicable with the EM, prior to commencement of seismic improvements.
- Demolition will preferably be scheduled for a low precipitation period. Temporary stormwater detention and/or pumping will remain in place.
- Install replacement outfall and catch basin to re-instate stormwater system.
- Complete any final modifications to the replacement outlet and replacement catch basin.
- Backfill excavation and repair paving.

The Contractor shall implement the mitigation measures outlined in Section 5.9 to prevent erosion and manage sediment during construction, as determined with the EM to be applicable.
6.0 **EMERGENCY RESPONSE**

The Contractor shall prepare and implement an Emergency Response Plan for construction that:

- Is consistent with the BHP Spill Prevention and Emergency Response Plan and FSD Emergency Response Plan
- Identifies the potential hazards onsite
- Develops systems for preventing accidents including appropriate training
- Provides mechanisms for minimising risks, loss, and damage from any incidents
- Provides a Project-specific incident management structure, that integrates with BHPs existing structure, to guide response activities in the event of an accidental release
- Includes an appropriate spill response communication plan that outlines procedures, spill tracking and reporting, and records of facility inspections.

The Contractor shall ensure that all site personnel are aware of the Emergency Response Plan, have been trained in its implementation, and are capable of following through with the Emergency Response Plan in the event of an emergency response.

6.1 **EMERGENCY COMMUNICATION**

Table 6-1 below outlines the Project’s emergency contacts. Once the Contractor's Site Foreman has been informed of the emergency, they shall communicate the incident, as required by the Emergency Response Plan.

<table>
<thead>
<tr>
<th>Table 6-1</th>
<th>Emergency Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project:</strong></td>
<td>BHP potash export facility</td>
</tr>
<tr>
<td><strong>Location:</strong></td>
<td>11060 Elevator Road, Surrey, BC</td>
</tr>
</tbody>
</table>
| **Hospital:** | Surrey Memorial Hospital 13750 96th Ave, Surrey, BC  
Non-Emergency: 604.588.3381 |
| **Ambulance:** | 911  
Non-Emergency: 604.660.6897 |
| **Police:** | 911  
Non-Emergency: 604.599.0502 |
| **Fire:** | 911  
Non-Emergency: 604.542.6700 |
| **VFPA Operations Centre:** | 604.665.9086 |
| **Local Authorities (Provincial Emergency Coordination Centre/MOE):** | 1.800.663.3456 |
6.2 ENVIRONMENTAL EMERGENCY PLAN

Construction is likely to entail the daily use of various dangerous goods, hazardous wastes, or hazardous chemicals. The Contractor shall ensure that materials onsite are appropriately labeled as per Workplace Hazardous Materials Information System or the Transportation of Dangerous Goods Act, and stored in an appropriate area of the site. These materials include, but are not limited to:

- Diesel
- Gasoline
- Propane
- Various lubricants
- Contaminated soil.

The Contractor shall amend the list of materials as new products are brought onsite or old products are withdrawn from use onsite and update SDSs to be kept onsite and attached to the CEMP. The Contractor shall maintain spill and emergency response equipment in good working order, and store Contractor materials in appropriate containers/storage areas. All Contractor personnel present at the site shall be trained in the Emergency Response Plan, including awareness training on the hazards onsite for releases to the environment. The Contractor shall report any releases to the onsite EM and the BHP Project Manager and/or the Environmental Health and Safety Manager who will determine the course of action required to mitigate and clean up any release.
6.3 **SPILL RESPONSE PLAN**

In the event of a release of any deleterious substances (e.g., hydrocarbon products) onsite, the Contractor shall implement the following procedures:

1. **Ensure Safety**
   - Ensure that site personnel are safe from the release as well as the public, equipment, property, and environment are at no other immediate risk due to the release.
   - Wear appropriate PPE to manage the release.
   - Take a step back and re-evaluate the situation. Do not rush and ensure you are adequately protected before entering a spill area with appropriate knowledge (e.g., check SDS for spilled product).
   - Notify people in the immediate vicinity of the incident.
   - Ensure there are no ignition sources in the area if the spill is a flammable material.

2. **Remove Source**
   - Act quickly to reduce the amount of product spilled and the environmental impact where possible.
   - Close valves, shut off equipment, or plug any holes or leaks as appropriate.
   - Stop the flow at its source.

3. **Secure the Area**
   - Limit access to the spill area.
   - Prevent unauthorised entry onto the site.

4. **Contain the Spill**
   - Prevent migration of the spill offsite, into any waterbody, or into any drainage structures (i.e., storm sewers).
   - Use sorbent materials (i.e., booms or pads) to contain the spill, or where appropriate soil berms.
   - Locate spill kits onsite within 100 m of any hazardous material storage area, and ensure they are readily accessible as needed.
   - If necessary, use a dyke or any other method to prevent the migration of the material.
   - Attempt to minimise the contamination onsite.

5. **Notify and Report**
   - Notify the appropriate internal managers of the spill.
   - Notify the Provincial Emergency Coordination Centre (1-800-663-3456), as required (review reportable levels table included in Appendix C). Note that contact to external agencies shall be communicated through BHP environmental management.
   - Provide details of the spill to any other external agency.
   - Complete the internal incident report.
7.0 CLOSURE

This work was performed in accordance with contract number 8500085638 between Hemmera and BHP Billiton Canada Inc. (BHP), dated September 11, 2015. This report has been prepared by Hemmera, based on research conducted by Hemmera, for the sole benefit of and use by BHP. In performing this work, Hemmera has in good faith relied on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The results presented herein should be considered within the context of the scope of work and Project terms of reference; further, the results are time-sensitive, and are considered valid only at the time the report was produced. The results contained in this report are based on the applicable guidelines, regulations, and legislation existing at the time the report was produced; any subsequent changes in the regulatory regime may alter the results.

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Report peer reviewed by:
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8.0 REFERENCES


SOIL AND GROUNDWATER MANAGEMENT PLAN
BHP Potash Export Facility
at Fraser Surrey Docks

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File: 1856-001.01
August 2018
EXECUTIVE SUMMARY

This Soil and Groundwater Management Plan provides guidance if contaminated soil and groundwater are encountered during construction of the proposed potash export facility (Project) at Fraser Surrey Docks (FSD). The Soil and Groundwater Management Plan is required as part of a permit application with Vancouver Fraser Port Authority to support the Project’s Application for Category D Application Submission Requirements for Project and Environmental Review No. 15-041. This document provides guidance on site contamination, soil management best practices, and health and safety measures, and considers the current federal and provincial standards and practices for soil management.

The Project is located on federal land under the jurisdiction of the Port of Vancouver, and is subject to federal environmental regulations and guidelines. The Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use (IL) (CCME 2014) will be used to evaluate the soil data collected at the Project site. In addition, the provincial Contaminated Sites Regulation (CSR) IL standards will be used to evaluate soil data collected at the Project site for comparison and disposal purposes.

The freshwater and marine components of the CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999) will be used to evaluate the groundwater analytical results. It is assumed that there will be a ten-fold dilution of groundwater within the receiving environment, and as such, the CCME Canadian Water Quality Guidelines will be multiplied by ten (i.e., CCME x10) for comparison to the groundwater analytical data. The CSR Generic Numerical Water Standards for the Protection of Freshwater and Marine Aquatic Life, as presented in Schedule 3.2 of the Stage 10 amendments, will be used to evaluate the groundwater data collected in the Project development area for comparison purposes.

Results of the Phase I Environmental Site Assessment (ESA) identified 10 areas of potential environmental concern (APECS) onsite and 2 APECs offsite. The Phase II ESA focused on APECs that were deemed to have higher potential to affect construction in the Project development area, but did not specifically include a sediment quality assessment in the berth area, as a regular maintenance dredge program is undertaken by the Vancouver Fraser Port Authority. Soil analytical results met both the applicable CCME IL guidelines and the CSR IL standards except for three samples, which contained concentrations of phenanthrene (a polycyclic aromatic hydrocarbon) greater than the CCME IL guideline; however, they were less than the BC CSR Soil Relocation to Non-agricultural Land standards for soil relocation. The groundwater analytical results met the applicable CCME guidelines and BC CSR standards except for dissolved iron, which exceeded the CCME freshwater aquatic life x10 guideline across the Project development area. Dissolved iron is naturally present in groundwater in BC, and the BC Ministry of Environment has exempted iron from most commercial / industrial uses under the CSR. Use of the Project development area by BHP Billiton Canada Inc. (BHP) is not likely to be constrained by the presence of elevated dissolved iron in groundwater.
A construction environmental monitor (CEM) will be onsite for the duration of the construction phase, and will provide advice and recommendations for dealing with suspect soils or material based on visual or olfactory observations encountered during excavation activities. Additionally, the CEM will complete field screening, soil sampling for characterization and disposal purposes, and estimating stockpile volumes, as well as provide oversight for the decommissioning and removal of underground storage tanks that are anticipated to be removed during construction. The CEM will also observe the work being completed for compliance with an Environmental Protection Plan.

Though no contamination has been identified within the Project site, areas of unforeseen contamination (i.e., suspect material) may exist. In addition, areas of unidentified soil contamination or debris may be encountered during construction or excavation activities, including in the underground storage tank nests. Field assessments of potentially contaminated soils or debris will include visual and olfactory observations for evidence of contamination during all excavation activities.

Debris in the fill layer may be encountered during construction activities, and if it appears contaminated or is not suitable for re-use onsite, it will be segregated and stockpiled for characterisation and offsite disposal. The CEM will provide details of any suspect material encountered during construction activities to evaluate whether soil characterization sampling is recommended. If any suspect material is encountered, it will be excavated and stockpiled. Ex-situ soil samples will be collected to characterize the material, and will be submitted to an approved laboratory for analysis of identified contaminants of concern within 48 hours of the sample being collected. Any excavated areas that remain open while awaiting confirmatory sample results will be barricaded to prevent access until backfilling is complete. Soil samples will also be collected from the extents (walls and floor) of the excavation(s) to document the soil quality remaining in-situ.

Suspect material encountered during construction will be stockpiled. Laboratory analysis of potential contaminants of concern from stockpile samples will depend on the nature of the suspect material encountered during construction. Once analytical results from the stockpile samples are available, the soil will either be transported offsite for disposal or re-used onsite. Tracking and record keeping of contaminated soil removed from the Project development area will demonstrate the movement of this soil has followed appropriate procedures.

Portions of construction or excavations that extend below the groundwater table (approximately 2 to 3 m below ground surface) may fill with groundwater. During the construction phase, the construction supervisor and onsite CEM will monitor excavations for suspect groundwater, and will stop work while additional dewatering and water management planning is completed, including sampling and analysis. When encountering suspect groundwater, the construction contractor will remove suspect groundwater from the excavation area and conduct sampling and laboratory analysis. Analytical groundwater data can either be obtained from nearby groundwater wells or from groundwater samples collected from the excavation or a holding tank once the water has been removed from the excavation. Disposal options for groundwater removed from the excavation will be determined once the analytical results have been received, either
offsite treatment and disposal or sewer discharge (dependent upon permitting). Once an excavation is completed, it will be backfilled to avoid excessive water management.

Any monitoring wells located within the construction areas will be decommissioned in conjunction with excavation activities by removing the existing steel flush-mount covers and completely pulling the polyvinyl chloride well casing from the ground using a tightly wrapped sling around the casing powered by an excavator. Any portion of a borehole that remains open or any broken casing that remains in the ground below the base of the excavation will be filled with coated bentonite pellets or bentonite grout.

Appropriate spill containment and cleanup supplies will be kept available onsite whenever the work program is underway, and personnel working on the Project will be familiar with implementing the spill cleanup plan and the deployment of spill response materials. In addition, a Spill Contingency Plan will be in place (included in a Health and Safety Plan) near working machinery. Workers will be suitably trained in spill response, and will verify that all machinery used onsite is kept in good working condition. Any significant maintenance will be conducted off of the FSD property, and onsite fuel will be stored away from open excavation areas so that spills will not enter the excavation.
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# ACRONYMS, ABBREVIATIONS, SYMBOLS, AND UNITS OF MEASURE

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>APEC</td>
<td>area of potential environmental concern</td>
</tr>
<tr>
<td>BC</td>
<td>British Columbia</td>
</tr>
<tr>
<td>BHP</td>
<td>BHP Billiton Canada Inc.</td>
</tr>
<tr>
<td>CCME</td>
<td>Canadian Council of Ministers of the Environment</td>
</tr>
<tr>
<td>CEM</td>
<td>Construction Environmental Monitor</td>
</tr>
<tr>
<td>CHR</td>
<td>combustible headspace reading</td>
</tr>
<tr>
<td>CSR</td>
<td>Contaminated Sites Regulation</td>
</tr>
<tr>
<td>ESA</td>
<td>Environmental Site Assessment</td>
</tr>
<tr>
<td>FSD</td>
<td>Fraser Surrey Docks</td>
</tr>
<tr>
<td>GWPR</td>
<td>Groundwater Protection Regulation</td>
</tr>
<tr>
<td>HASP</td>
<td>health and safety plan</td>
</tr>
<tr>
<td>Hemmera</td>
<td>Hemmera Envirochem Inc.</td>
</tr>
<tr>
<td>IDC</td>
<td>intermodal distribution centre</td>
</tr>
<tr>
<td>IL</td>
<td>Industrial land use</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>MTBE</td>
<td>methyl tert-butyl ether</td>
</tr>
<tr>
<td>PAH</td>
<td>polycyclic aromatic hydrocarbon</td>
</tr>
<tr>
<td>PCOC</td>
<td>potential contaminant of concern</td>
</tr>
<tr>
<td>PHC</td>
<td>petroleum hydrocarbon</td>
</tr>
<tr>
<td>Project</td>
<td>proposed potash export facility</td>
</tr>
<tr>
<td>UST</td>
<td>underground storage tank</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Symbol, Unit of Measure</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>bgs</td>
<td>below ground surface</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>ppm</td>
<td>parts per million</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION

This Soil and Groundwater Management Plan is intended to provide guidance during future construction activities if contaminated soil and groundwater are encountered during construction of the proposed potash export facility (Project) at Fraser Surrey Docks (FSD), located in Surrey, British Columbia (BC). Figure 1 illustrates the Project site, including soil and groundwater investigation locations, along with the Project development area.

The Soil and Groundwater Management Plan is required as part of a permit application with Vancouver Fraser Port Authority to support the Project’s Application for Category D Application Submission Requirements for Project and Environmental Review No. 17-108. The purpose of this document is to provide guidance to workers who will be conducting intrusive work (i.e. excavation and construction) in the Project development area about possible site contamination, underground storage tank (UST) decommissioning/removal, soil management best practices, monitoring well decommissioning and health and safety measures. This Soil and Groundwater Management Plan is based on the current and future industrial activities at the Project site, and considers the current federal and provincial standards and practices for soil management and UST decommissioning/removal. Should the Project site be modified, this Soil and Groundwater Management Plan will be adjusted accordingly. The Soil and Groundwater Management Plan will be re-evaluated regularly to verify the regulatory framework remains up to date.
This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations therein.

2. All mapped features are approximate and should be used for discussion purposes only.

Notes

Sources

- PDA obtained from BH&P Biloxi Ref: 46080-LD-DWG-00394.dwg
- Basemap: Ortho Imagery, City of Surrey.
2.0 REGULATORY FRAMEWORK

The Project is located on federal land under the jurisdiction of the Port of Vancouver, and is therefore subject to federal environmental regulations and guidelines. As such, the Canadian Council of Ministers of the Environment (CCME) guidelines will be used to evaluate the analytical data collected at the Project.

For comparison purposes, the analytical results will also be evaluated using the provincial standards contained in the BC Environmental Management Act, SBC 2003, c. 53 and the associated standards identified in the Contaminated Sites Regulation, BC Reg. 375/96 CSR. In addition, any soil that is transported offsite will also be subject to the Hazardous Waste Regulation, BC Reg. 63/88.

Stage 10 amendments to the CSR come into effect on November 1, 2017. These amendments update all soil, water, and vapour standards, and consolidate the existing schedules into four new schedules, Schedules 3.1 (soil), 3.2 (water), 3.3 (vapour), and 3.4 (sediment). They also eliminate the Schedule 7 unique soil standards to trigger Contaminated Soil Relocation and replace it with applicable standards in Schedule 3.1. The transition period for these amendments is ongoing, and the version available at the time (B.C. Reg. 12/2017, January 31, 2017) has been applied to the Project site. Construction in the Project development area will begin after November 1, 2017 when the Stage 10 amendments have come into effect.

The selection of specific CCME and CSR soil and groundwater guidelines and standards are discussed in more detail below.

2.1 APPLICABLE SOIL GUIDELINES AND STANDARDS

The following soil guidelines and standards were selected for the Project site based on site-specific factors, which are outlined below. All soil transported offsite will also be subject to the BC Hazardous Waste Regulation.

2.1.1 Federal Guidelines

The CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use (IL) (CCME 2014) will be used to evaluate the soil data collected at the Project site.

2.1.2 Provincial Standards

The CSR IL standards will be used to evaluate soil data collected at the Project site for comparison purposes. The Generic Numerical Soil Standards and Matrix Numerical Soil Standards for IL, as presented in Schedule 3.1 from the Stage 10 amendments, will be the basis for comparison to the soil analytical results (Government of BC 2006).
In accordance with the CSR and based on the groundwater use in the vicinity of the Project site, the
following site-specific factors were considered when determining the applicable matrix soil standards:

- Intake of contaminated soil (mandatory at all sites)
- Toxicity to soil invertebrates and plants (mandatory at all sites)
- Groundwater flow to surface water used by aquatic life (generic, freshwater, and marine).

Where applicable, the most stringent of the above-noted matrix standards will be used to assess the soil
analytical results in the Project development area.

2.2 **APPLICABLE GROUNDWATER GUIDELINES AND STANDARDS**

For the purposes of selecting the appropriate freshwater or marine standard for groundwater, the receptor
must be considered. The closest receptor for the Project site is the Fraser River, and under the CSR, the
BC Ministry of Environment (MOE) has determined the following:

1. The Fraser River above the Pattullo Bridge is considered to be freshwater.
2. The Main Arm of the Fraser River below the George Massey tunnel, or the North Arm of the Fraser
   River below the westernmost tip of Mitchell Island (i.e., southern foot of Cambie Street) is
   considered marine or estuarine.

Based on the location of the Project site (below the Pattullo Bridge but upstream of the George Massey
Tunnel), both freshwater and marine guidelines and standards may apply. Following a conservative
approach for this assessment, both marine and freshwater federal guidelines and provincial standards for
groundwater will be used.

2.2.1 Federal Guidelines

The freshwater and marine components of the CCME *Canadian Water Quality Guidelines for the Protection
of Aquatic Life* (CCME 1999) will be used to evaluate the groundwater analytical results. It is important to
note, however, that these guidelines were established for ambient concentrations in surface waters, and as
such do not provide a basis to evaluate groundwater analytical data, since aquatic life is potentially exposed
to diluted groundwater entering and mixing with surface waters. It is assumed that there will be a ten-fold
dilution of groundwater within the receiving environment, and as such, the CCME Canadian Water Quality
Guidelines will be multiplied by ten (i.e., CCME x10) for comparison to the groundwater analytical data.

2.2.2 Provincial Standards

The *CSR Generic Numerical Water Standards for the Protection of Freshwater and Marine Aquatic Life*, as
presented in Schedule 3.2 of the Stage 10 amendments, will be used to evaluate the groundwater data
collected in the Project development area for comparison purposes.
In the absence of any federal guidelines related to the decommissioning of monitoring wells, the BC Groundwater Protection Regulation, BC Reg. 39/2016, (GWPR) provides standards for groundwater monitoring well decommissioning, as outlined in Section 4.6.

2.3 UNDERGROUND STORAGE TANK DECOMMISSIONING AND REMOVAL

As outlined in the Permit application report (Section 2.1.1.1), there are three USTs containing diesel and gasoline (associated with current FSD operations) that will be decommissioned and removed as part of the Project. The three USTs are located southeast of Shed 5 / Diesel Shop. The following section describes the regulatory framework under which construction work onsite is to be completed. As the Project is on federal land (administered by VFPA), federal requirements are applicable at the Project site. Environmental legislation and associated requirements that are applicable to the Project are described in Table 1. The Contractor shall have all required permits necessary to undertake the construction, and shall comply with the terms and conditions of these permits.

### Table 1 UST Guidance Relevant to the Project

<table>
<thead>
<tr>
<th>Guidance Document</th>
<th>Description</th>
<th>Applicability to the Project and Mitigative Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia Ministry of Environment and Climate Change Strategy, Technical Guidance Document #1: Site Characterization and Confirmation Testing (TG1)</td>
<td>This document contains guidance for investigating and characterizing fill and soil that may be contaminated.</td>
<td></td>
</tr>
<tr>
<td>Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products. 2003</td>
<td>This document has been prepared for owners of storage tank systems, the petroleum marketing and distribution industry, and federal, provincial, and territorial departments which have the authority to regulate storage tanks containing petroleum or allied petroleum products</td>
<td>Part 9 of this document contains the requirements for the closure and withdrawal from service of storage tank systems, either temporarily or permanently. Provisions for tank removal and disposal are provided to ensure that abandoned storage tanks do not cause environmental problems.</td>
</tr>
</tbody>
</table>

The CCME Guidelines are applicable to the media that remains at the Project site following the removal of the USTs. As part of the Project some soils excavated may require additional management off-site (i.e., to a provincially licensed facility). Therefore, the standards contained in the BC Environmental Management Act (EMA) and the associated Contaminated Sites Regulation (CSR) will be used to evaluate the site data for comparison and soil management purposes.
3.0 SUMMARY OF SITE CONDITIONS

3.1 SUMMARY OF PHASE I AND PHASE II ENVIRONMENTAL SITE ASSESSMENTS

In September 2016, Hemmera conducted a Phase I and II Environmental Site Assessment (ESA, and in July 2017 completed a supplemental site investigation (Appendix 4.2-N Phase I and II Environmental Site Assessment). The Phase I and II ESA were carried out for the Project site (a portion of the FSD property) to identify and investigate areas of potential environmental concern (APECs) and potential contaminants of concern (PCOCs) associated with present and historical onsite and offsite activities that may have affected soil and groundwater within the Project site, specifically in the Project development area.

Results of the Phase I ESA indicate that there are 10 APECs onsite and 2 APECs offsite, as summarised in Table 2 and Figure 2.

<table>
<thead>
<tr>
<th>APEC</th>
<th>Source</th>
<th>Comments</th>
<th>PCOCs</th>
<th>Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>APEC 1</td>
<td>Drum Storage</td>
<td>Located to the east of the garage: storage of both full and empty drums of hydraulic fluid, grease, anti-freeze, and oil.</td>
<td>Petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), metals</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 2</td>
<td>Maintenance Garage</td>
<td>Crews use the garage to conduct maintenance on the vehicles used at FSD.</td>
<td>Petroleum hydrocarbons, PAHs, metals</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 3</td>
<td>Crane Shop (Shed 5)</td>
<td>Shed 5 is used for maintenance of cranes at the south end and for maintenance of diesel vehicles at the north end; the middle and the upper level is used as offices.</td>
<td>Petroleum hydrocarbons, PAHs, metals</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 4</td>
<td>Fill of Unknown Quality (related to Shed 2)</td>
<td>The area where Shed 2 is now located used to be the Mount Baker Plywood Plant. The area was filled with soil of unknown quality. Wood treatment chemicals may also have been used in this area.</td>
<td>Petroleum hydrocarbons, PAHs, metals</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 5</td>
<td>Dip Tank 2</td>
<td>Formerly located north of Shed 5, the dip tank was reported to be remediated. Several sampling programs (soil and groundwater) have also been completed. Hemmera was not provided a report that summarised this remediation; therefore, it is considered an APEC.</td>
<td>Antisapstain chemicals</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC</td>
<td>Source</td>
<td>Comments</td>
<td>PCOCs</td>
<td>Media</td>
</tr>
<tr>
<td>-------</td>
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<td>----------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Onsite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APEC 6</td>
<td>Fueling Station</td>
<td>Located to the south of the Maintenance Garage, the fueling station includes three USTs (two for diesel and one for gasoline) as well as three pumps.</td>
<td>Petroleum hydrocarbons, PAHs, methyl tert-butyl ether (MTBE), lead</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 7</td>
<td>Former UST Area</td>
<td>Previous reports have identified four USTs, a waste oil storage tank, and a pump island, which were decommissioned in 1992. The location of this area could not be confirmed.</td>
<td>Petroleum hydrocarbons, PAHs, MTBE, lead</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 8</td>
<td>Site-wide Fill</td>
<td>Fill material of unknown quality was potentially used to fill portions of the Project site and for building purposes.</td>
<td>Petroleum hydrocarbons, PAHs, metals</td>
<td>Soil, groundwater</td>
</tr>
<tr>
<td>APEC 9</td>
<td>Run-off related to site activity</td>
<td>The run-off from the Project site is collected in catch basins and then directed into the drainage system, which is subsequently discharged into the Fraser River. There is potential for chemicals from activities onsite to be discharged to the river and then to accumulate in sediment, although regular maintenance dredging programs are completed within the FSD berth areas.</td>
<td>Petroleum hydrocarbons, PAHs, metals</td>
<td>Sediment</td>
</tr>
<tr>
<td>APEC 10</td>
<td>Intermodal Distribution Centre (IDC) Railway Area</td>
<td>The railway yard in the northeast corner of the Project site.</td>
<td>Petroleum hydrocarbons, PAHs, metals</td>
<td>Groundwater</td>
</tr>
<tr>
<td><strong>Offsite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APEC 11</td>
<td>11041 Elevator Road (Bekaert Property)</td>
<td>The former Bekaert steel fabrication plant is cross-gradient to the Project Site. Data from 2010 indicate that there are zinc concentrations in groundwater that exceed the applicable guidelines and standards.</td>
<td>Metals</td>
<td>Groundwater</td>
</tr>
<tr>
<td>APEC 12</td>
<td>9815 Robson Road (Western Cleanwood Property)</td>
<td>The Western Cleanwood property has a dip tank and conducts wood processing and treatment. This property is up- and cross-gradient to the Project site.</td>
<td>Total chlorinated phenols (including pentachlorophenol)</td>
<td>Groundwater</td>
</tr>
</tbody>
</table>
Areas of Potential Environmental Concern

Legend

- Project Development Area
- APEC 1: Drum Storage
- APEC 2: Maintenance Garage
- APEC 3: Crane Shop (Shed 5)
- APEC 4: Fill of Unknown Quality (Related to Shed 2)
- APEC 5: Dip Tank 2
- APEC 6 and 7: Fueling Station, Former UST Area
- APEC 8: Site Wide Fill
- APEC 9: Site Activity Related Run-Off
- APEC 10: IDC Railway Area
- APEC 11: 11041 Elevator Road (Bekaert Property)
- APEC 12: 9815 Robson Road (Clearwood Property)

Notes

1. This map is not intended to be a "operational" document, but a visual aid of the information contained within the referenced Report. It is intended to provide a visual summary of the scope of services and limitations described therein.

2. All mapped features are approximate and should be used for discussion purposes only.

Sources

- PDA obtained from BHP Billiton Ref: 40603/L0-DWG-003445.dwg
- Basemap: Ortho Imagery from City of Surrey
The Phase II ESA did not specifically target each of the identified onsite and offsite APECs, and instead focused on APECs that were deemed to have higher potential to affect construction in the Project development area. These APECs are identified as follows:

- APEC 1 (Drum Storage)
- APEC 2 (Maintenance Garage)
- APEC 3 (Crane Shop / Shed 5)
- APEC 5 (Dip Tank 2)
- APEC 10 (IDC Railyard Area).

In addition, each of the locations investigated APEC 8 (site-wide fill). Onsite APECs (4, 6, 7, and 9) and the two identified offsite APECs (11 and 12) were not directly investigated in the Phase II ESA program due to the location or distance of the APEC relative to the Project development area. The Phase II ESA also did not specifically include a sediment quality assessment in the berth area APEC 9 (run-off related to Project site activity), as a regular maintenance dredge program is undertaken by the Vancouver Fraser Port Authority.

The soil analytical results met both the applicable CCME industrial land use (IL) guidelines and the CSR IL standards, with the exception of three samples, which contained concentrations of phenanthrene (a polycyclic aromatic hydrocarbon) greater than the CCME IL guideline. Although these soil samples exceeded the CCME IL guideline, they were less than the BC CSR Soil Relocation to Non-agricultural Land standards for soil relocation (i.e., the soil can be relocated with no restrictions using existing analytical results). In addition, these samples were collected at depths greater than 2.4 metres (m) below ground surface (bgs) (i.e., they are not surficial in nature), and are not likely to be encountered in future earth works, as the three samples are not located in the region of any future development. Soil analytical results are shown on Figure 3.
### Soil Analytical Results

#### Table 18

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Contaminated Sites Regulation Industrial Land Use Standards</th>
<th>Contaminated Sites Regulation Industrial Land Use Stage 10 Amendments Standards</th>
<th>CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use Standards</th>
<th>Soil analytical results are less than applicable guidelines/standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>Contaminated Sites Regulation Industrial Land Use Standards</td>
<td>Contaminated Sites Regulation Industrial Land Use Stage 10 Amendments Standards</td>
<td>CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use Standards</td>
<td>Soil analytical results are less than applicable guidelines/standards</td>
</tr>
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<td>Soil</td>
<td>Contaminated Sites Regulation Industrial Land Use Standards</td>
<td>Contaminated Sites Regulation Industrial Land Use Stage 10 Amendments Standards</td>
<td>CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use Standards</td>
<td>Soil analytical results are less than applicable guidelines/standards</td>
</tr>
<tr>
<td>Soil</td>
<td>Contaminated Sites Regulation Industrial Land Use Standards</td>
<td>Contaminated Sites Regulation Industrial Land Use Stage 10 Amendments Standards</td>
<td>CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use Standards</td>
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</tr>
<tr>
<td>Soil</td>
<td>Contaminated Sites Regulation Industrial Land Use Standards</td>
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<td>CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use Standards</td>
<td>Soil analytical results are less than applicable guidelines/standards</td>
</tr>
<tr>
<td>Soil</td>
<td>Contaminated Sites Regulation Industrial Land Use Standards</td>
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<tr>
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<td>CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, Industrial Land Use Standards</td>
<td>Soil analytical results are less than applicable guidelines/standards</td>
</tr>
</tbody>
</table>

#### Notes
- This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described herein. The map's features are approximate and should be used for discussion purposes only.
- Source: BHP Billiton Ref:

#### Sources
- PDAC attached from BHP Billiton Ref:
- Basemap: Ortho Imagery from City of Surrey.

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### Soil and Groundwater Management Plan

**Fraser Surrey Docks, Surrey, BC**

**Legend**
- Project Development Area
- Project Infrastructure
- Monitoring Well
- Soil analytical results are less than applicable guidelines/standards
- Soil analytical results for at least one parameter are greater than applicable guidelines/standards

**Title**

**Soil and Groundwater Management Plan**

**Figure**

- Production Date: August-10-2017

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### Additional Information
- Parameter concentrations expressed in µg/g
- Additional parameters and analytical data are presented in Table 18
The groundwater analytical results met the applicable CCME guidelines and BC CSR standards, with the exception of dissolved iron, which exceeded the CCME freshwater aquatic life x10 guideline across the Project site. Dissolved iron is naturally present in groundwater in various parts of BC, and the BC MOE has exempted iron from most commercial / industrial uses under the CSR. The source of the elevated iron in groundwater likely has originated from multiple sources, including naturally occurring iron in groundwater (documented in an up-gradient / cross-gradient location), natural geochemical reactions causing iron to increase, and to a lesser extent, fill placed of unknown origin and quality placed at the Project site. Use of the Project development area by BHP is not likely to be constrained by the presence of elevated dissolved iron in groundwater. Groundwater analytical results are shown on Figure 4.
### Groundwater Analytical Results

<table>
<thead>
<tr>
<th>Location</th>
<th>MW16-01</th>
<th>MW16-02</th>
<th>MW16-03</th>
<th>MW16-04</th>
<th>MW16-05</th>
<th>MW16-06</th>
<th>MW16-07</th>
<th>MW16-08</th>
<th>MW16-09</th>
<th>MW17-01</th>
<th>MW17-02</th>
<th>MW17-03</th>
<th>MW17-04</th>
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<tr>
<td>Parameter</td>
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<td>CSR Stage 10</td>
<td>CSMR</td>
<td>CSR Stage 10</td>
<td>CSMR</td>
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<td>CSR Stage 10</td>
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<td>CSR Stage 10</td>
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<td>CSR Stage 10</td>
<td>CSMR</td>
<td>CSR Stage 10</td>
<td>CSMR</td>
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<tr>
<td>VOCs</td>
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<td>-</td>
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<td>PAHs</td>
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<td>-</td>
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<td>-</td>
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</tr>
<tr>
<td>R-Dissolved Metals</td>
<td>Fe</td>
<td>Cu</td>
<td>Zn</td>
<td>Pb</td>
<td>Cr</td>
<td>Ni</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Well Depth, To Bottom (m)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>Well Depth, To Water (m)</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>2.5</td>
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<td>2.7</td>
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<td>3.1</td>
<td>3.2</td>
<td>3.3</td>
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</tr>
</tbody>
</table>

**Notes**

- Basemap: Ortho Imagery from City of Surrey
- Features are approximate and should be used for discussion purposes only.

**Sources**

- PCA obtained from BHP Billiton Ref: 4660/LD DRS 089999.dwg
- Basemap: Ortho Imagery from City of Surrey

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### Project Development Area

- Project Infrastructure
- Monitoring Well

### Groundwater Analytical Results for at least one parameter are greater than applicable guidelines/standards
3.2 SOIL AND GROUNDWATER CONDITIONS

3.2.1 Soil Conditions

The stratigraphy of the soils beneath the Project site was logged during each borehole drilling events and is summarised in Table 3.

Table 3 Soil Stratigraphy

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Approximate Depth Below Ground Surface (m bgs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt and concrete cover</td>
<td>0 to ~ 0.7 m</td>
</tr>
<tr>
<td>Unit A - Road Base (suspect fill unit)</td>
<td>0.25 m to ~ 1 m</td>
</tr>
<tr>
<td>Unit B - Sand. Grey or brown, wet, fine to medium-grained (sand unit – suspect fill)</td>
<td>~1 m to ~ 3.5 m</td>
</tr>
<tr>
<td>Unit C - Clay and Silt, trace organics, trace sand. Grey, moist, and soft (clay/silt unit)</td>
<td>~ 3.5 m to ~ 6 m</td>
</tr>
<tr>
<td>Unit D – Sand. Fine-grained, grey, wet (sand unit)</td>
<td>~ 6 m to ~13.7 m</td>
</tr>
</tbody>
</table>

The Phase II ESA identified an asphalt and concrete cover, then a road base material that was evident up to 1 m bgs, with the exception of the IDC RAILYARD Area, where the road base extended to approximately 3 m bgs, followed by site-wide sand fill material that varied in depth across the Project site. Petroleum hydrocarbon odours or staining were not observed in any of the boreholes advanced during drilling activities. The maximum investigated drilling depth was 13.7 m bgs in MW17-4 and MW17-5 (advanced in the vicinity of the proposed rail car unloading station) (see Figure 3).

3.2.2 Groundwater Conditions

The locations of the monitoring wells are shown on Figure 1. Table 4 summarises the monitoring data collected in 2016 and 2017. Hemmera also completed a well differential survey relative to an arbitrary benchmark (10.0 m). Combustible wellspace readings (CWRs) were also collected as part of the monitoring.
Table 4  Groundwater Monitoring Results

<table>
<thead>
<tr>
<th>Date</th>
<th>Well Location</th>
<th>Depth to Water (m)</th>
<th>Relative Water Elevation</th>
<th>Depth to Bottom (m)</th>
<th>CWR (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-Sep-16</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>MW16-01</td>
<td>2.49</td>
<td>5.58</td>
<td>3.20</td>
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<td></td>
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<td>5.63</td>
<td>3.22</td>
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<tr>
<td></td>
<td>MW16-03</td>
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<td>5.63</td>
<td>3.58</td>
<td>&lt; 5</td>
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<td></td>
<td>MW16-04</td>
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<td>5.55</td>
<td>3.24</td>
<td>95</td>
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<td></td>
<td>MW16-05</td>
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<td>5.54</td>
<td>3.21</td>
<td>140</td>
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<td></td>
<td>MW16-06</td>
<td>2.81</td>
<td>5.26</td>
<td>4.84</td>
<td>20</td>
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<tr>
<td></td>
<td>MW16-07</td>
<td>Dry</td>
<td></td>
<td>3.96</td>
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<td></td>
<td>MW16-08</td>
<td>3.25</td>
<td>4.35</td>
<td>4.23</td>
<td>&lt; 5</td>
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<td></td>
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<td>17-Jul-17</td>
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<td></td>
<td>MW17-3</td>
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<td>5.95</td>
<td>2.98</td>
<td>&lt; 5</td>
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<tr>
<td></td>
<td>MW17-4</td>
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<td>5.72</td>
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<tr>
<td></td>
<td>MW17-5</td>
<td>1.91</td>
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<td>2.94</td>
<td>&lt; 5</td>
</tr>
<tr>
<td></td>
<td>MW17-6</td>
<td>2.39</td>
<td>5.51</td>
<td>3.21</td>
<td>280</td>
</tr>
</tbody>
</table>

Note: Measurements taken as metres below top-of-pipe.

No evidence of light non-aqueous-phase liquids was measured in the 15 monitoring wells. Groundwater at the Project site is likely, at least in part, to be hydraulically influenced by the changes in tidal stages of the Fraser River (due to the proximity to the Project site). The southern portion of the Project site will likely be the least influenced by tidal fluctuations.
4.0 **SOIL AND GROUNDWATER MANAGEMENT PROCEDURES**

Excavation and construction activities may affect the surrounding environment (e.g., surface water, groundwater, aquatic life, terrestrial life, recreation and aesthetic values). The following sections present the recommended soil and groundwater management procedures that will be followed when encountering suspect materials during excavation in the Project development area.

4.1 **CONSTRUCTION ENVIRONMENTAL MONITORING**

A construction environmental monitor (CEM) will be onsite for the duration of the construction phase. The CEM will provide advice and recommendations for dealing with suspect soils or material (or any other material not suitable to remain in situ) based on visual or olfactory observations encountered during excavation activities. Additionally, the CEM will complete field screening, soil sampling for characterization and disposal purposes, and estimating stockpile volumes. The CEM will also observe the work being completed for compliance with an Environmental Protection Plan. Examples of topics in an Environmental Protection Plan include erosion and sediment control, general housekeeping, fuel handling, and spill response.

4.2 **UNDERGROUND STORAGE TANK DECOMMISSIONING AND REMOVAL**

Prior to any excavation activities, a ground penetrating radar (GPR) survey will be completed to confirm tank orientation, extents, and depth. The location of the UST will be outlined with paint in the field for future reference.

4.2.1 **Tank Removal Process**

The tanks and associated piping will be decommissioned and removed per the requirements outlined in the CCME (2003) guidance document, and be conducted in general accordance with the following:

- Overburden will be excavated to expose the top of the USTs.
- The tanks will be emptied of product and water, and be adequately inerted by the Contractor prior to commencing any removal, e.g. using dry ice.
- The USTs will be removed from their nests using an excavator then placed on polyurethane sheets. If a high groundwater table exists, the buoyancy of the tank will be monitored at all times and at no time should anyone be on or near the tank, as serious injury could result if the tank floats free. If hold tie-down straps are present, a safe means of removal will be followed.
- The tank will be crushed/damaged to ensure that it is not be reused and will be transported off site for recycling.
- Visually impacted soils from each tank nest will be excavated and placed into a single large stockpile. The stockpile will be characterized by screening soil samples for combustible soil vapours using a gas detector.
- Excavated soil will be screened and stockpile per the requirements outlined in Section 4.3.1 and Section 4.3.2.
- The excavation will be backfilled with approved ‘clean’ imported fill or native materials at appropriate lift thickness and compacted.
4.2.2 Tank Nest Confirmation Soil Sampling

The EM will collect in-situ soil samples at appropriate intervals to demonstrate the removal of contaminated soils has been completed. Discrete confirmatory soil samples will be collected from the walls and the floor of the excavation using the excavator bucket, at a sampling frequency in general accordance to guidelines established by Technical Guidance #1. The number of in-situ samples to be collected depends on the final extents and depth of the excavation. Samples (for potential laboratory submission) are recommended to be collected in the initial 0.5 m, and every one metre (1.0 m, 2.0 m, and so on) on vertical faces. Soil samples from each wall and floor will then be selected for analysis based on field observations and combustible headspace screening (i.e., for the petroleum hydrocarbon area).

Samples will then be submitted to the project laboratory for analysis of identified contaminants of concern. Any excavated area(s) remaining open awaiting confirmatory sample results will be barricaded to prevent access until backfilling is complete.

The EM will collect combustible headspace reading (CHRs) in conjunction with collection of any soil characterization samples, prepare a site figure showing the location and depths of each sample, and take field notes about soil conditions encountered.

The EM will evaluate the laboratory analytical data from all confirmatory samples submitted against the applicable regulatory guidelines and standards, and advise BHP of the results. Should any confirmatory sample have contaminant concentrations above the applicable guidelines or standards, additional excavation activities may be required.

Note that a groundwater investigation may be warranted based on the results of the in-situ soil confirmation samples collected and analyzed from each tank nest following tank removal.

4.3 Contaminated Soil Management

As discussed in Section 3.0, there is no identified contamination within the Project site based on the results of the Phase II ESA work; however, there is potential for areas of unforeseen contamination (i.e., suspect material) to exist, or contaminated soil that may be excavated from the UST tank nests. Hence, any intrusive activities in the Project development area will consider soil or debris management within the context of encountering potential contamination.

4.3.1 Field Screening and Management of Suspect Material

Areas of unidentified soil contamination or debris may be encountered during construction or excavation activities. In order to manage potentially suspect materials in the Project development area, field assessments of suspect soil or debris will occur. Field screening will include visual and olfactory observations for evidence of contamination during all excavation activities. Examples of evidence of
contamination include the presence of free product (fuel or other petroleum hydrocarbon (PHC) products), sheen or hydrocarbon odours or staining, or debris not encountered during drilling. Collection of CHRs from suspect material samples may help to provide an indication of presence of volatile PHCs.

Debris in the fill layer may be encountered during construction activities. Examples of debris may include, but will not be limited to creosote-treated timber, other wood debris, concrete, and construction debris. If this debris appears contaminated, or does not appear suitable for re-use onsite, it will be segregated and stockpiled for characterisation (if required) and offsite disposal. Disposal options are discussed in Section 4.3.4.

The CEM, excavator operator, and construction supervisor will all be responsible for identifying suspect material. If suspect material is encountered, this soil or debris will be segregated into potential contamination types, and placed into stockpiles, as described in Section 4.3.3.

The CEM will provide details of any suspect material encountered during construction activities to the appropriate project manager and environmental consultant to evaluate whether soil characterization sampling is required where suspect material has been excavated. The CEM will prepare a figure showing where suspect material has been identified and excavated, including estimates of surface area, depth intervals, and total volumes.

4.3.2 Stockpile Management and Sampling Procedure

Suspect material encountered during construction will be stockpiled according to the following procedures:

1. As suspect materials are excavated, they will be segregated and stockpiled according to the potential soil contaminants and suspected waste classification (i.e., degree of contamination), with guidance from the onsite CEM.

2. Stockpile areas and volumes will be determined depending on the types and amount of suspect material encountered during construction. A stockpile area will be selected prior to the start of the construction phase, located away from the construction activities and away from any storm drains.

3. Durable polyethylene or vinyl tarp material will be available onsite during the construction phase, and laid out underneath and overtop of the stockpiles. Sandbags (or other heavy items) will be placed to sufficiently weight the tarps and prevent blow-away.

4. Soil berms and swales will be constructed around the stockpile area to intercept and divert any surface water on the up-gradient side, and to intercept and contain any silt and potentially contaminated run-off from the stockpile area on the down-gradient side. Intercepted water down-gradient of the stockpile area will be passed through filter cloth material to provide spot filtration of silt and sediments before being discharged back to the Project site.

5. If free product or PHC sheen is observed in the stockpiled soils or intercepted water, absorbent pads and/or booms will be placed in the down-gradient containment swales, and disposed of accordingly once no longer required.
Soil samples from stockpiles will be collected in accordance with the *BC MOE Technical Guidance 1: Soil Characterization and Confirmation Testing* (BC MOE 2009). Laboratory analysis of potential COCs from stockpile samples will depend on the nature of the suspect material encountered during construction, including visual and olfactory observations and CHRs, as determined through discussions with the CEM and the environmental consultant. The turnaround time for analytical results from stockpile samples will be determined through discussions with the construction project manager.

Once analytical results from the stockpile samples are available, the soil will either be transported offsite for disposal or re-used onsite. The environmental consultant shall evaluate the laboratory analytical data from all stockpile samples submitted against the applicable regulatory guidelines and standards, advise the construction team of the results, and provide guidance on the disposal or re-use options.

The construction contractor shall plan to maintain and monitor any stockpiles until laboratory analytical results are available and a stockpile disposal strategy is prepared.

### 4.3.3 Excavation Soil Sampling

If any suspect material is encountered during excavation activities (other than the UST excavation program), the CEM will direct the excavation of this material to the extent required for the Project requirements (e.g., installation of subsurface utilities, infrastructure, etc.). Although BHP is not the ‘responsible party’ for said contamination, it will be managed in a responsible manner in accordance with regulatory requirements. Specifically, this suspect material (if identified) will be stockpiled / managed per the method outlined in Section 4.3.2 and transported off-site for disposal. Once the final extents of the excavation(s) is reached, in-situ soil samples will be collected from the walls and base of the excavation to document the quality of soil remaining in-situ.

Discrete confirmatory soil samples will be collected from the walls and the floor of the excavation using the excavator bucket, at a sampling frequency in general accordance with guidelines established by the *BC MOE Technical Guidance 1: Soil Characterization and Confirmation Testing* (MOE 2009). The number of in situ samples collected will depend on the final extents and depth of the excavation. Samples (for potential laboratory submission) will be collected in the initial 0.5 m, and every metre (1.0 m, 2.0 m, and so on) on vertical faces. Soil samples from each wall and floor will then be selected for analysis based on field observations and CHRs (i.e., for the petroleum hydrocarbon area).

Samples selected for analysis will be submitted to a CAEAL certified laboratory for analysis of identified contaminants of concern with a rush turnaround time so that the analytical results are available within 48 hours of the sample being collected. Any excavated areas that remain open while awaiting confirmatory sample results will be barricaded to prevent access until backfilling is complete.
The CEM will collect CHRs in conjunction with collection of any soil characterization samples, prepare a figure showing the location and depths of each sample, and take field notes about soil conditions encountered.

The CEM shall evaluate the laboratory analytical data from all in-situ soil samples submitted against the applicable regulatory guidelines and standards, and advise the construction team of the results.

### 4.3.4 Contaminated Material Disposal Plan

#### 4.3.4.1 Material Loading Procedures

Care will be taken to avoid mixing of clean and contaminated or suspect materials because soil quality in specific areas of the Project site may not be fully understood. Improper mixing, handling, removal, or segregation could influence offsite disposal volumes and increase costs.

#### 4.3.4.2 Disposal Options

Disposal options for suspect material will be determined based on the analytical results from stockpile samples and the applicable guidelines in Section 2.1.

- Non-leachable soil exceeding the CSR IL standards may be disposed of offsite at a local permitted facility, subject to a review of the CSR Stage 10 amendments as construction will be carried out after November 1, 2017.
- Soil that contains leachable contaminants of concern (based on the Hazardous Waste Regulation leachate quality standards), may only be disposed of at facilities that are permitted to accept hazardous wastes.
- Petroleum hydrocarbon-contaminated soils may be accepted at a number of bioremediation facilities in the Lower Mainland.
- General construction debris can be disposed of at a licensed landfill in the Lower Mainland.
- Creosote treated timber or pilings, for example, can be disposed of at EcoWaste Industries in Richmond.
- Waste metals can be sent to a local metals recycler (e.g., ABC Steel) for recycling.

#### 4.3.4.3 Tracking and Record Keeping

Tracking and record keeping of contaminated soil removed from the Project development area will be kept to demonstrate the movement of this soil has followed appropriate procedures.

For non-hazardous waste soils leaving the Project site, the construction contractor or onsite CEM will develop and implement a soil tracking and record-keeping system to document the source location of all excavated soils and debris that leaves the Project site, the date of excavation, estimated tonnage, date of hauling, receiving facility, and the waste soil classification. Copies of shipping documents and receipts of delivery will be kept. Formal soil manifests are not required for non-hazardous waste soils.
Should any hazardous waste soils be removed from the Project development area, a hazardous waste generator number will need to be issued to the Project (or FSD), and carbon-copy soil tracking manifests issued. A manifest for each truckload of hazardous waste soil will need to be completed, with one copy of the manifest kept at the Project and two copies maintained by the truck driver. Upon delivery of the soil to the receiving facility, the truck driver will provide the disposal facility operator with the two manifest copies. The facility operator will record the scaled weight and keep one copy of the manifest on file and forward the second copy of the manifest to the Project (or FSD) or its environmental representative.

### 4.4 Contaminated Groundwater Management

Portions of construction or excavations that extend below the groundwater table (approximately 2 to 3 m below ground surface) may fill with groundwater. Standing water within an excavation area may pose construction and environmental challenges, and will be considered in construction planning; however, the focus of this section is the management of suspected contaminated groundwater.

During the construction phase, the construction supervisor and onsite CEM will monitor excavations for groundwater suspected of being contaminated (suspect groundwater), as evidenced by visual and olfactory observations. If suspect groundwater is encountered, work will stop while additional dewatering and water management planning, including sampling and rush lab analysis, is completed.

To mitigate the risk to workers when encountering suspect groundwater, the construction contractor will have reasonably quick access (i.e., within the day) to either a vacuum truck or system of pumps, hoses, and holding tanks to remove the suspect groundwater from the excavation area and conduct sampling and laboratory analysis. Analytical groundwater data can either be obtained from nearby groundwater wells or from groundwater samples collected from the excavation or a holding tank once the water has been removed from the excavation. Disposal options for groundwater removed from the excavation will be determined once the analytical results have been received, either offsite treatment and disposal or sewer discharge (dependent upon permitting). Once an excavation is completed, it will be backfilled to avoid excessive water management. To avoid cross contamination issues suspect groundwater will not be transferred to other excavations within the Project development area for temporary storage.

Based on discussions with VFPA, discharge of untreated groundwater directly to any freshwater surface water body is not acceptable. It is further noted that VFPA will not allow discharge via storm systems without review and acceptance of a dewatering plan which addresses iron concentrations. If discharge of water to sanitary or storm systems is needed for accumulated excavation water, a permit (either from VFPA or Metro Vancouver) will be required prior to discharge. If discharge of water to sanitary or storm systems are contemplated for accumulated excavation water, a permit (either VFPA or Metro Vancouver) will be required prior to discharge.
4.5 **SITE CLEANLINESS AND FUEL HANDLING**

Appropriate spill containment and cleanup supplies will be kept available onsite whenever the work program is underway, and personnel working on the Project will be familiar with implementing the spill cleanup plan and the deployment of spill response materials.

A Spill Contingency Plan will be in place (included in a Health and Safety Plan (HASP)) in close proximity to working machinery. Workers will be suitably trained in spill response, and will verify that all machinery use onsite is kept in good working condition. Any significant maintenance will be conducted offsite or away from the Project development area.

Any fuel that is onsite will be carefully and safely handled and stored away from open excavation areas so that spills will not enter the excavation.

4.6 **GROUNDWATER MONITORING WELL DECOMMISSIONING**

In the absence of any federal guidelines related to the decommissioning of groundwater monitoring wells, the GWPR provides standards for groundwater monitoring well decommissioning. Where monitoring wells are no longer required, the GWPR provides details for decommissioning wells.

Any monitoring wells located within the construction areas will be decommissioned in conjunction with excavation activities by removing the existing steel flush-mount covers and completely pulling the polyvinyl chloride well casing from the ground using a tightly wrapped sling around the casing powered by an excavator. Any portion of a borehole that remains open or any broken casing that remains in the ground below the base of the excavation will be filled with coated bentonite pellets or bentonite grout.

Decommissioning records consistent with the requirements of Schedule 4 of the GWPR will be completed for each monitoring well decommissioned.
5.0 HEALTH AND SAFETY

The construction contractor shall be responsible for completing a site-specific HASP as the prime contractor. The HASP will address the potential health and safety risks and precautionary measures associated with the construction activities. In addition, the HASP will specifically include risks and precautionary measures related to exposure to contaminated or suspect soil and groundwater, and potentially to vapour. Precautionary measures will include, but will not be limited to, details for eliminating or mitigating exposure to contaminants, details on excavation procedures and potential confined spaces, provisions for adequate personal protective equipment, provisions for first-aid personnel and supplies, and an Emergency Response Plan.

The risks to workers associated with contaminated soil and groundwater, and potentially vapour include exposure via inhalation, ingestion, and absorption of toxic or potentially toxic materials into the body. No contamination was encountered during the investigation at the Project site; however, areas of unforeseen contamination may exist, and the HASP will include consideration of the potential for encountering additional contaminants. This Soil and Groundwater Management Plan can serve as a supplement to any site-specific HASP, but it will not supersede local, provincial, or federal regulations with respect to worker health and safety.
6.0  CLOSING

This work was performed in accordance with Contract 8500085638 between Hemmera Envirochem Inc. (Hemmera) and BHP Billiton Canada Inc. (BHP), dated September 11, 2015. This report has been prepared by Hemmera, based on fieldwork and desktop work conducted by Hemmera, for the sole benefit and use by BHP. In performing this work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and Project terms of reference; further, the findings are time sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

We sincerely appreciate the opportunity to have assisted you with this Project. If there are any questions, please do not hesitate to contact the undersigned by phone at 604.669.0424.

Report prepared by:
Hemmera Envirochem Inc.

Evelyn Playle, B.Sc., EIT
Junior Engineer

Report peer reviewed by:
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James Mair, Geo.L, PMP
Senior Project Manager

Chuck Jochems, P.Eng., CSAP
Practice Leader, Investigations & Remediation
7.0 REFERENCES


APPENDIX B
Chance Find Procedure
ARCHAEOLOGICAL CHANCE FIND PROCEDURE
BHP Potash Export Facility
at Fraser Surrey Docks

Prepared for:
BHP Billiton Canada Inc.
130 3rd Avenue South
Saskatoon, SK S7K 1L3

Prepared by:
Hemmera Envirochem Inc.
18th Floor, 4730 Kingsway
Burnaby, BC V5H 0C6

File: 1856-001.01
May 2018
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Appendix A  Contact List
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Appendix C  Chance Find Report Form
Appendix D  Examples of Archaeological and Cultural Heritage Resources
ACRONYMS, ABBREVIATIONS, SYMBOLS, AND UNITS OF MEASURE

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>British Columbia</td>
</tr>
<tr>
<td>BHP</td>
<td>BHP Billiton Canada Inc.</td>
</tr>
<tr>
<td>FSD</td>
<td>Fraser Surrey Docks</td>
</tr>
<tr>
<td>Project</td>
<td>proposed potash export facility</td>
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</table>
1.0 INTRODUCTION

The purpose of this document is to address the possibility of archaeological deposits becoming exposed during in-ground activities during development of the proposed potash export facility (Project) by BHP Billiton Canada Inc. (BHP) at the Fraser Surrey Docks (FSD) terminal located at 11060 Elevator Road in Surrey, British Columbia (BC). The Chance Find Procedure provides protocols to follow if archaeological materials are inadvertently discovered during site preparation or construction, particularly appropriate protection and documentation.

Archaeological resources are non-renewable, very susceptible to disturbance, and finite in number. Considered valuable resources, archaeological sites are protected for their historical, cultural, scientific, and educational value to the general public, local communities, and First Nations. The regulatory context for archaeological resources is outlined below in Section 2.0.

Potential disturbance to archaeological resources must be avoided or managed by partners, agents, and contractors undertaking BHP-sponsored work at the Project site. The objectives of this Chance Find Procedure are to promote preservation of archaeological data while minimising disruption of construction scheduling. It is recommended that all onsite personnel and contractors who may interact with soils potentially having archaeological potential within the Project development area be informed of the Chance Find Procedure and have access to a copy while onsite.

Site preparation or construction work involving excavation, movement, or disturbance of soils, including shoreline and intertidal areas, have the potential to impact archaeological materials, if present. Activities such as road construction, land clearing, and soil excavation are all examples of activities that may adversely affect archaeological deposits. Even areas with previous development history, such as placement of fill, may have intact archaeological deposits in native soil underlying the fill.

Contact information for appropriate designated individuals is provided in Appendix A. A record of contact form is included in Appendix B, and the Chance Find Report Form is included as Appendix C.
2.0 LEGISLATION

In Canada, archaeological materials or sites on federal lands and lands underwater fall under the jurisdiction of the minister responsible for Parks Canada Agency (S.4(1) B) and the Parks Canada Agency Act, SC 1998, c. 31. Guidelines provided by the federal government pertaining to archaeological materials or sites include Parks Canada Guidelines for the Management of Archaeological Resources (2005), and Canada Research and Collection Permit Process (2017) as well as the Treasury Board’s Guide to the Management of Moveable Heritage Assets (2008). While provincial laws do not apply to federal lands, “Parks Canada refers to certain aspects for guidance as a matter of practicality” (Parks Canada 2005), and generally accepts as best practice the archaeological standards established by the BC Archaeology Branch. These include the Archaeological Impact Assessment Guidelines (MFLNRO 1998).
3.0 ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCES

There are more than 32,000 archaeological sites currently recorded in BC with many more being added to the provincial inventory every year. For this reason, it is very likely that individuals will encounter an archaeological site during their lifetime, either knowingly or unknowingly. This protocol has been established to increase awareness of this important resource and assist in Project planning.

The Fraser River and adjacent shoreline areas have been highly utilised by Aboriginal groups for thousands of years. The remnants of this occupation are represented in today’s landscape by a wide variety of site types, most of which are related to village or camping sites, resource gathering and production (such as fishing and hunting), tool making, and traditional ceremonial or ritual activities. Some sites that may be immediately visible to a non-archaeologist include:

- Shell middens, which are cultural accumulations of shells, stratified in white and grey layers, mixed with streaks of charcoal, ash, and other debris. Shell middens were also commonly used as human burial sites. Look for accumulations of layered, crushed, and whole shell possibly mixed with charcoal, black soil, and other food remains (i.e., fish bone).

- Surface features such as depressions created by former habitations, earthen fortifications, rock cairns, clam gardens, burned rock, and fish traps. Fish weirs and traps typically comprise linear arrangements of wooden stakes interwoven with brush or mats to trap fish on the falling tide. Look for short stubs of small-diameter branches in linear arrangements in the inter-tidal zone or along the river bank.

- Artifacts that have become visible on the land surface owing to erosion or recent land-altering activity. These may be produced in a variety of materials such as stone, bone, antler, wood, or shell. Look for obviously formed stone objects or pieces of stone that have been chipped or ground in a non-natural way. Bone and antler artifacts will exhibit obvious modification (i.e., cutting, shaping, incision, etc.).

- Buried cultural remains that may be sighted in a cut-bank, excavation, eroded shoreline, or other exposed deposit.

- Waterlogged deposits or wet sites, which are locations containing organic artifacts (i.e., wood, bark, or plant fibre), that are preserved due to their presence in an anaerobic (oxygen free) environment. Look for fragmentary baskets, rope, carved wood implements (e.g., wedges), and similar objects eroding from intertidal silts or clay deposits.

For examples of the above-noted archaeological and cultural heritage resources, please refer to Appendix D.

Proper implementation of a Chance Find Procedure may lead to the discovery of cultural heritage resources that were not identified in previous archaeological site investigations. As such, it is a valuable tool when properly implemented.
For the Chance Find Procedure to be effectively implemented during construction, the Site Supervisor must ensure that all relevant personnel onsite understand the procedure and importance of following it if cultural heritage resources are encountered. Additionally, training of field personnel on archaeological and cultural heritage resources that might potentially be found onsite should be provided both by the Project archaeologist as well as the Contractor’s environmental monitoring team.
4.0 **ARCHAEOLOGICAL CHANCE FIND PROCEDURE**

4.1 **PROCEDURE FOR ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCES**

If construction personnel discover what is suspected to be a possible archaeological site or cultural heritage resource, the following procedure will be followed:

1. **Stop all potentially damaging work within 50 m of the newly discovered archaeological site to avoid damaging the site.**
2. **Do not disturb any archaeological materials that are encountered.**
3. Report the discovery to the Site Supervisor, the Environmental Monitor, or if they are unavailable to:
   - Fraser Surrey Docks, telephone: 778-838-7581 or
   - BHP, telephone: 306-321-2328, who will provide further instructions.

   If contacting the FSD or BHP representative is not possible, please contact the Project archaeologist at Kleanza, telephone: 778-892-7760, and alternatively Hemmera, telephone: 604-669-0424 ext. 278.

4. FSD or BHP representatives will contact other entities as required.
5. Record where the find is located, either by flagging the site, using a global positioning system, or other location marking device, and leave all materials in place.
6. BHP or Hemmera will contact the Project archaeologist who will visit the site as soon as possible and determine the potential significance of the materials and required mitigation.
7. If the significance of the archaeological materials is judged to be sufficient to warrant further action and the archaeological materials cannot be avoided, then the Project archaeologist will consult with appropriate government representatives and representatives of local First Nation communities to determine the appropriate course of action.

4.2 **PROCEDURE FOR REPORTING HUMAN REMAINS**

If any personnel discovers what may be possible human remains, the following procedure will be followed:

1. **Stop all potentially damaging work within 50 m of the newly discovered archaeological site to avoid damaging the site.**
2. **Do not disturb any possible human remains that are encountered.**
3. Report the discovery to the Site Supervisor or if they are unavailable to:
   - Fraser Surrey Docks, telephone: 778-838-7581 or

   The Site Supervisor shall **contact the RCMP at 604-599-0502** (non-emergency).
4. Contact the Project archaeologist at Kleanza, telephone: 778-892-7760, and alternatively Hemmera, telephone: 604-669-0424 ext. 278.
In accordance with the provincial *Found Human Remains Policy* (MFLNRO n.d.), if human remains are discovered, the following steps will also be followed:

1. The Coroner's Office and local policing authority will be notified; the Coroner's Office determines whether the matter is of contemporary forensic concern.

2. If the remains are not of forensic concern, FSD, BHP and the Project archaeologist may attempt to facilitate disposition of the remains.

3. If a cultural affiliation for the remains can be determined, best efforts will be made to contact an organisation representing that cultural group. If the remains are of Aboriginal ancestry, best efforts will be made to contact the relevant First Nation(s).

4. Generally, if remains are still buried and are under no immediate threat of further disturbance, they will not be excavated or removed. If the remains have been partially or completely removed, FSD, BHP, and the Project archaeologist will facilitate disposition.

5. BHP will arrange for a qualified forensic anthropologist or the Project archaeologist to provide an assessment of the remains.

### 4.3 Reporting

The individual reporting the Chance Find must complete the Archaeological Chance Find Procedure Record of Contact found in Appendix B. The Project archaeologist will complete the Archaeological Chance Find Report Form, Appendix C, and inform BHP of when work may resume in the cordoned-off area of the site.
5.0 REFERENCES


APPENDIX A
Contact Names and Telephone Numbers
<table>
<thead>
<tr>
<th>Agency</th>
<th>Name of Contact</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraser Surrey Docks</td>
<td>Rajan Mann</td>
<td>604-754-6492</td>
</tr>
<tr>
<td>BHP Principle Environment</td>
<td>Valerie Bond</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>BHP Indigenous Relations</td>
<td>Courage Bear</td>
<td>306-385-8400</td>
</tr>
<tr>
<td>Hemmera Envirochem</td>
<td>Ashley Ahrens</td>
<td>604-669-0424 ext. 153</td>
</tr>
<tr>
<td>Project Archaeologist – Kleanza Consulting</td>
<td>Greg Morrissey</td>
<td>250-638-8970</td>
</tr>
<tr>
<td>RCMP</td>
<td>Surrey Detachment</td>
<td>604-599-0502</td>
</tr>
<tr>
<td>Coroner, Vancouver Metro Region</td>
<td>Angela Sosnoski, Regional Coroner</td>
<td>604-660-7708</td>
</tr>
<tr>
<td>Ecological Restoration Specialist Parks</td>
<td>Marlow Pellatt</td>
<td>604-666-2556</td>
</tr>
<tr>
<td>Canada Agency / Government of Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancouver Fraser Port Authority</td>
<td>Jessica Davies</td>
<td>604.665.9000</td>
</tr>
</tbody>
</table>
APPENDIX B
Record of Contact
<table>
<thead>
<tr>
<th>Agency</th>
<th>Date and Time of Contact</th>
<th>Name of Person Contacted</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
APPENDIX C
Chance Find Report Form
CHANCE FIND REPORT FORM

Recorder’s Name/Affiliation: _____________________________________________________________

Date:_______________________________________________________________________________

Location of chance find (Location description, UTM coordinates, road, quarter section, depth below surface):
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Photographs Taken (#s):
____________________________________________________________________________________

Description of find:
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Method used to mark and protect find:
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Distribution:

☐ Contractor or Site Supervisor
☐ Project Archaeologist
☐ Heritage Resources Unit or Paleontologist
☐ R.C.M.P.
☐ Local First Nation(s)

Sketch Map
EXAMPLES OF ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCES

Shell Midden - Cultural accumulations of shells, stratified in white and grey layers, mixed with streaks of charcoal, ash, and other debris. Shell middens were also commonly used as human burial sites. Look for: accumulations of layered, crushed, and whole shell possibly mixed with charcoal, black soil, and other food remains (i.e., fish bone).

Photo 1: Shell Midden

Photo 2: Salmon and Herring Bone
Photo Source: http://www.sliammonfirstnation.com/archaeology/fishing.html
Artifact or Artifact Scatter - Portable object(s) manufactured or modified by human beings. These items may include chipped or ground stone objects, or implements made from bone and antler. Look for: obviously formed stone objects or pieces of stone that have been chipped or ground in a non-natural way. Bone and antler artifacts will exhibit obvious modification (i.e., cutting, shaping, incision, etc.).

Photo 3: Chipped Stone Tools
Photo Source: https://archaeologyblog.treetimeservices.ca/tag/lithics/page/2/

Photo 4: Chipped Stone Tools
Photo Source: http://montecristomagazine.com/magazine/summer-2015/the-city-before-the-city
Photo 5: Hand Mauls (Hammer Stones)
Photo Source: http://www.adsny.com/nyindian/roughstonearticles.html

Photo 6: Fish Net Sinker Stone
Photo Source: https://oregonhistoryproject.org/articles/historical-records/sinker-stone-columbia-river/#.WVKgbOmoQyUk
Waterlogged Deposits or Wet Sites - Locations containing organic artifacts (i.e., wood, bark, or plant fibre), that are preserved due to their presence in an anaerobic (oxygen-free) environment. Look for: fragmentary baskets, rope, carved wood implements (e.g., wedges), and similar objects eroding from intertidal silts or clay deposits.
Fish Weir and Traps - Fish weirs typically comprise linear arrangements of wooden stakes interwoven with brush or mats to trap fish on the falling tide. Look for: short stubs of small-diameter branches in linear arrangements in the inter-tidal zone.
Photo 11: Intertidal Fish Weir
APPENDIX C
Reportable Quantities
**APPENDIX C – REPORTABLE LEVELS OF CERTAIN SUBSTANCES**

In the event of an incident onsite, the first task is to ensure that all site personnel are safe, then follow the Containment and Clean-up Strategy as outlined within the Plan. Determine the material spilled and quantity, then reference Table B for the reportable levels for various substances to the Provincial Emergency Coordination Centre (1-800-663-3456).

<table>
<thead>
<tr>
<th>Item</th>
<th>Substance Spilled</th>
<th>Specified Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Class 1, Explosives as defined in section 2.9 of the Federal Regulations</td>
<td>Any quantity that could pose a danger to public safety or 50 kg</td>
</tr>
<tr>
<td>2</td>
<td>Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regulations</td>
<td>10 kg</td>
</tr>
<tr>
<td>3</td>
<td>Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regulations</td>
<td>10 kg</td>
</tr>
<tr>
<td>4</td>
<td>Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regulations</td>
<td>5 kg</td>
</tr>
<tr>
<td>5</td>
<td>Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regulations</td>
<td>100 L</td>
</tr>
<tr>
<td>6</td>
<td>Class 4, Flammable Solids as defined in section 2.20 of the Federal Regulations</td>
<td>25 kg</td>
</tr>
<tr>
<td>7</td>
<td>Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regulations</td>
<td>50 kg or 50 L</td>
</tr>
<tr>
<td>8</td>
<td>Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the Federal Regulations</td>
<td>1 kg or 1 L</td>
</tr>
<tr>
<td>9</td>
<td>Class 6.1, Toxic Substances as defined in section 2.27 (a) of the Federal Regulations</td>
<td>5 kg or 5 L</td>
</tr>
<tr>
<td>10</td>
<td>Class 6.2, Infectious Substances as defined in section 2.27 (b) of the Federal Regulations</td>
<td>1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
</tr>
<tr>
<td>11</td>
<td>Class 7, Radioactive Materials as defined in section 2.37 of the Federal Regulations</td>
<td>Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the &quot;Packaging and Transport of Nuclear Substances Regulations&quot;</td>
</tr>
<tr>
<td>12</td>
<td>Class 8, Corrosives as defined in section 2.40 of the Federal Regulations</td>
<td>5 kg or 5 L</td>
</tr>
<tr>
<td>13</td>
<td>Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations</td>
<td>25 kg or 25 L</td>
</tr>
<tr>
<td>14</td>
<td>Waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation</td>
<td>1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
</tr>
<tr>
<td>15</td>
<td>Leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation</td>
<td>25 kg or 25 L</td>
</tr>
<tr>
<td>Item</td>
<td>Column 1 Substance Spilled</td>
<td>Column 2 Specified Amount</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>16</td>
<td>Waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the hazardous Waste Regulation</td>
<td>5 kg or 5 L</td>
</tr>
<tr>
<td>17</td>
<td>Waste asbestos as defined in section 1 of the Hazardous Waste Regulation</td>
<td>50 kg</td>
</tr>
<tr>
<td>18</td>
<td>Waste oil as defined in section 1 of the Hazardous Waste Regulation</td>
<td>100 L</td>
</tr>
<tr>
<td>19</td>
<td>Waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation</td>
<td>5 kg or 5 L</td>
</tr>
<tr>
<td>20</td>
<td>Polycyclic biphenyl wastes as defined in section 1 of the Hazardous Waste Regulation</td>
<td>25 kg or 25 L</td>
</tr>
<tr>
<td>21</td>
<td>Waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation</td>
<td>50 kg or 50 L</td>
</tr>
<tr>
<td>22</td>
<td>Biomedical waste as defined in section 1 of the Hazardous Waste Regulation</td>
<td>1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
</tr>
<tr>
<td>23</td>
<td>A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 – 22</td>
<td>25 kg or 25 L</td>
</tr>
<tr>
<td>24</td>
<td>A substance, not covered by items 1 to 23 that can cause pollution</td>
<td>200 kg or 200 L</td>
</tr>
<tr>
<td>25</td>
<td>Natural gas</td>
<td>10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas</td>
</tr>
</tbody>
</table>