

TRANS MOUNTAIN EXPANSION PROJECT

2115 COMMISSIONER STREET – PROJECT SUPPORT SITE

PORT OF VANCOUVER PROJECT PERMIT SUBMISSION

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Revision	Date	Remarks
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TRANSMOUNTAIN

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Kiewit Ledcor TMEP Partnership

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1 INTRODUCTION

This Construction Environmental Management Plan (CEMP) is the primary document to guide overall environmental best management practices to be implemented by the construction team for the 2115 Commissioner Street – temporary Project Support Site (the Project) to reduce or eliminate effects on the environment and meet regulatory requirements.

The general objectives of the CEMP are:

- To protect valued ecological components and socio-economic features along within the Project area during the design and construction phases of the project;
- to ensure compliance with the conditions of environmental approvals from regulatory authorities; and
- to reduce potential environmental liabilities.

Construction management of the Project recognizes that human safety, traffic management and other factors are also important during design and construction planning; an overall environmental benefit can be achieved by expeditious completion of the contract (i.e., minimizing the duration of disturbance). It is the Contractor's goal to complete the construction activities associated with the setup of this site in a safe and efficient manner and to protect and enhance environmental and socioeconomic resources.

It is important to note that the CEMP and its component plans may need periodic revisions when further site-specific information becomes available or as Project conditions change. At a minimum, the CEMP will be reviewed prior to the start of construction to ensure mitigation measures within the CEMP are appropriate for the scheduled construction activities at the Project site. It is acknowledged that Vancouver Fraser Port Authority (VFPA) will make the final determination on the suitability, completeness and adequacy of the CEMP and any future revisions.

2 PROJECT INFORMATION

2.1 Location

As indicated in Figure 1, the Project will be located at 2115 Commissioner in the western end of the East Vancouver Port Lands region. The site is bounded by the Burrard Inlet to the North and the Canadian National Railway to the South.

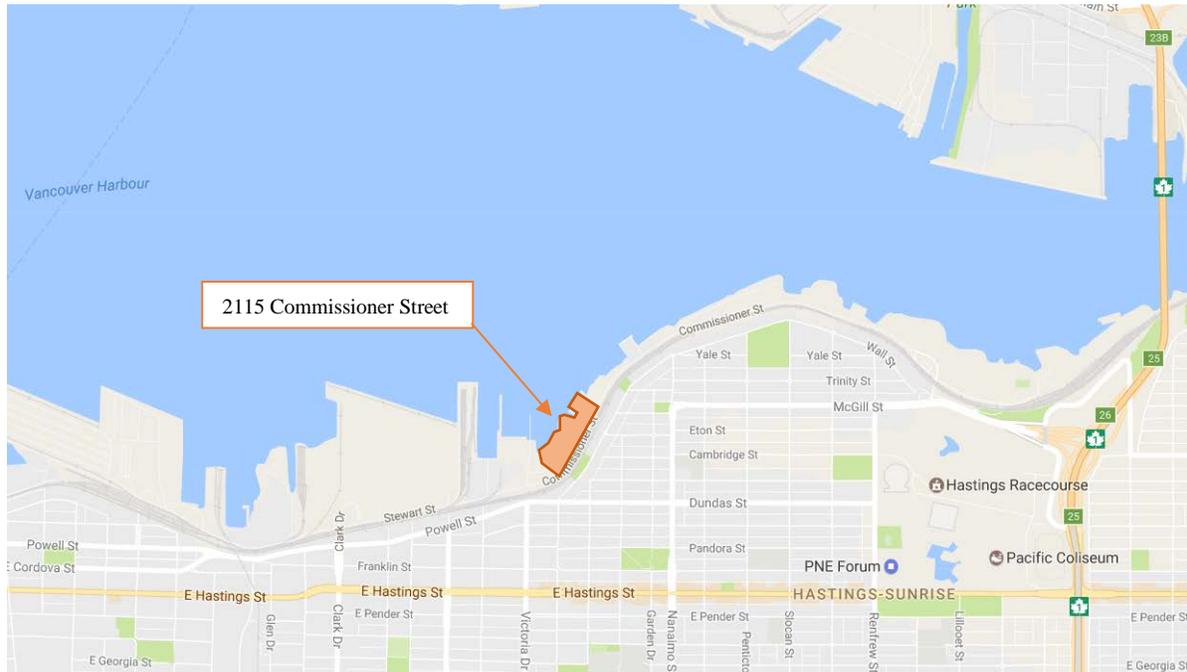


Figure 1: Project Location

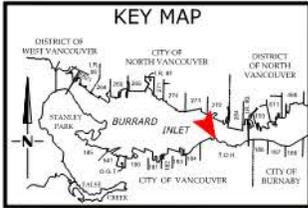
2.2 Project Description

The 2115 Commissioner Street – Project Support Site includes site preparation and construction of a new trestle dock, Construction of the Project site will include:

- General site preparation and grading, including any necessary upgrades to the existing ground to make suitable for the operation of a 300T Crawler Crane.
- Assembly of a 300T Crawler Crane.
- Installation of a trestle dock and dolphin piles, to facilitate material transfer from barges, legal trucks and the laydown yard. This may also be used as an access point for crews to board water taxis to be transported to the Westridge Marine Terminal;
- Setup of temporary construction offices, lunchrooms, washcars and storage containers.
- Installation of temporary lighting, fences, gates and other measures to secure the site for the duration of the Project.
- Layout of internal access roads, vehicle parking locations, bus staging areas and security access points.

A plan drawing showing the proposed site layout is provided in Figure 2.

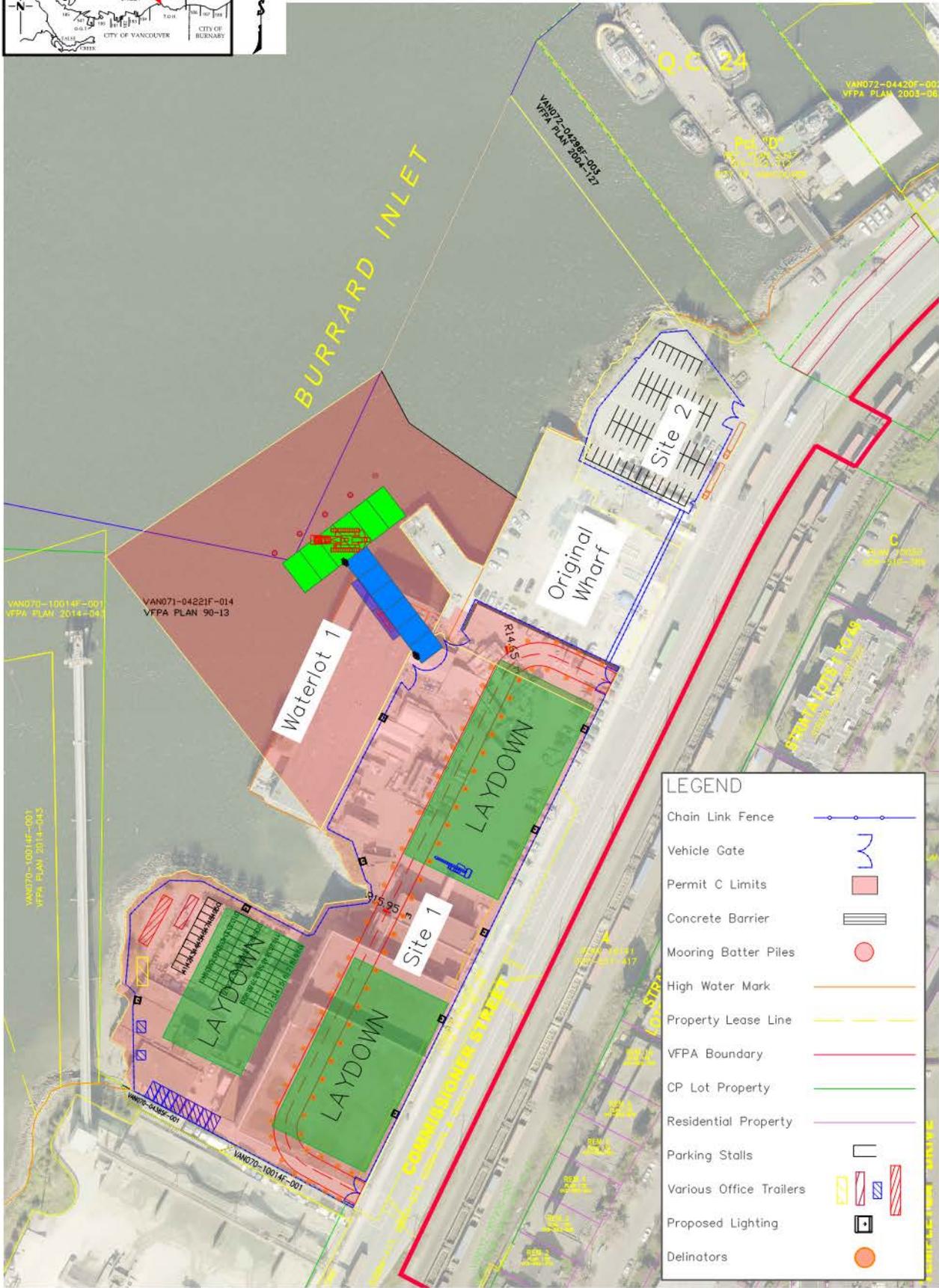
**2115 Commissioner Street – Project Support Site: Vancouver Fraser Port Authority
Construction Environmental Management Plan
Rev.2**



REFERENCE - VAN047-10614F-001

NOTES:

- DISTANCES ARE SHOWN IN INTERNATIONAL METRES AND DECIMALS THEREOF.
- BEARINGS ARE U.T.M., AND ARE DERIVED FROM VFPA CONTROL SURVEY.
- PRIOR TO COMPUTATION OF U.T.M. CO-ORDINATES, MULTIPLY DISTANCES BY COMBINED SCALE FACTOR 0.99960.
- FINAL DIMENSIONS AND CO-ORDINATES ARE SUBJECT TO SURVEY.



LEGEND	
Chain Link Fence	
Vehicle Gate	
Permit C Limits	
Concrete Barrier	
Mooring Batter Piles	
High Water Mark	
Property Lease Line	
VFPA Boundary	
CP Lot Property	
Residential Property	
Parking Stalls	
Various Office Trailers	
Proposed Lighting	
Delinators	

Figure 2: Site Plan

2.3 Project Schedule

The construction activities planned for this site will be split into three sections based on Permit Applications filed with VFPA as follows.

- 1) Site Investigations (Category A permit)
 - This covers the entire 2115 Commissioner Street Site.
 - This will include:
 - i. - Mapping and locating of all utilities onsite – Sites 1 & 2
 - ii. - Where any ground disturbance is planned in proximity of any utilities, physically verifying
 - iii. the location of utilities by hand or using a hydro-vac – Site 1 only
 - iv. - Site survey and layout – Sites 1 & 2
 - v. - Geotechnical investigations, as shown in Appendix A, including;
 - vi. o Two ~30m deep CPT bore holes
 - vii. o Four 3-4m deep test pits or auger hole
 - viii. o Actual depths will be determined by the onsite Geotechnical Engineer.
 - ix. The site will be restored to its previous condition after tests are conducted.
 - This work commenced on July 20th, 2017 and will take approximately 4-6 weeks to complete.
- 2) Setup for Parking, Busing and Water Taxi
 - This is Specific to Site 2, as shown on Figure 2.
 - This will include:
 - i. - Minor clean-up and site grading including:
 - Removal of any debris left onsite
 - Filling in of pot holes
 - Removal of shrubs and bushes
 - ii. - Installation of 150m of 1.8m high standard chain link fence, with barb wire above the top bar.
 - iii. - Installation of a 10m wide, double swing gate for vehicle access and a 1.2m wide man-gate for personnel access.
 - iv. - Placement of 60m of precast concrete barricades to delineate the Original Wharf.

- v. - Delineation of approximately 80 parking spots and two street side bus staging areas.
 - vi. Installation of a flexi-float dock and engineered access ramp, for worker access to water taxi.
 - The flexi-float dock would be secured to the seabed using two – 600mm diameter spud' piles, connected to the dock. The preliminary dimensions for the flexi-float is 40' x 20' x 7' with a 77' engineered access ramp.
 - Appendix B shows a representative flexi-float configuration, as planned for this site.
 - Appendix C shows a sample design for the access ramp from a previous project. A new engineered design will be completed for the ramp on this site prior to installation.
 - vii. Following removal of the temporary access ramp and flexi-float dock (anticipated to occur in December 2017), marine riparian vegetation will be replanted within the affected area.
- This work will take approximately 4 weeks to complete, commencing upon the receipt of the project permits; anticipated in September 2017. After the construction is complete, the site will enter its operational phase which will last until the end of the TMEP project, approximately two years later.
- 3) Setup of Marine Service Yard.
- This is Specific to Site 1, as shown on Figure 2.
 - This will include:
 - i. Minor clean-up and site grading including:
 - Removal of any debris left onsite
 - Filling in of pot holes
 - ii. Upgrades to existing ground, as required to support a 300T crawler crane. This may include:
 - Milling of existing asphalt.
 - Temporary removal of the top 300-600mm of gravel.
 - Placement of Geotextile grid or fabric
 - Replacement, compaction and grading of gravel previously removed.
 - Import and placement of additional gravel required to achieve design capacity and grade.
 - iii. Installation of 280 m of 1.8m high standard chain link fence, with barb wire above the top bar.
 - iv. Installation of a 10m wide, double swing gate for vehicle access and a 1.2m wide man-gate for personnel access.

- v. Placement of 55m of precast concrete barricades to delineate the Original Wharf.
 - vi. Placement of mobile office trailers, washroom trailer and connex storage containers.
 - vii. Layout of approximately 50 parking stalls for onsite and offsite staff.
 - viii. Construction of a Temporary Trestle consisting of:
 - A 30' x 115' Access Trestle
 - A 48 x 180' Main Trestle
 - 25 ea – 600mm diameter pipe piles
 - 28 ea – 900mm diameter pipe piles
 - ix. Installation of temporary mobile small boat dock made up of 3 flexi-float barges.
 - x. Installation of temporary lights on the existing wooden poles along Commissioner Street, as shown in Appendix I.
 - These lights will designed and installed based on the PER Guidelines for Lighting.
 - Specifically, they will be installed to improve safety and security on the site, without creating nuisance lighting for the neighbouring community or marine vessels.
 - The detailed site lighting plan will be prepared by a qualified lighting professional prior to the installation of lights on site.
 - We will coordinate this with BC Hydro and necessary approvals and permits will be obtained prior to any installations.
- This work will take approximately 8-12 weeks to complete, commencing upon the receipt of the project permits; anticipated in December 2017. After the construction is complete, the site will enter its operational phase which will last until the end of the construction of the TMEP project, approximately two years later.

As part of the Design - Build process, the establishment of demolition and construction schedules is a key and evolving process as preliminary design drawings are developed. As the design for this site is still in the preliminary stages, it is possible for the construction schedule to evolve. The Project team will continue to work with VFPA staff throughout the permitting process to address outstanding issues and how they may impact the overall schedule of the works.

2.4 Site Description

The site at 2115 Commissioner Street is located 8 km west of the Second Narrows Bridge in Vancouver, British Columbia. The lot is located on a previously disturbed, level industrial site and the ground at the site is currently bare gravel. The site can be accessed via Commissioner Street and no temporary access is required.

2.4.1 Habitat Assessment

Detailed biophysical assessment reports of the existing aquatic and terrestrial habitat have been completed for the Project. Summaries of the findings in those reports are provided below.

2.4.1.1 Aquatic

The 2115 Commissioner Street site is located in the inner harbor of the Burrard Inlet approximately 12 km west of the Westridge Marine Terminal, which is located in the Central Harbour of Burrard Inlet. Similar fish species and habitats are present at both the sites and a DFO Important Area for Pacific salmon overlaps with these two sites. The installation and operation of the temporary trestle, access trestle and small flexi-float dock is not expected to result in lasting deleterious effects to existing intertidal and subtidal habitats or species. Shading of vegetated rocky habitats is expected to be partial and vary throughout the day under the access trestle and small boat dock. Although some sessile or slow moving benthic invertebrates (e.g., painted anemone, giant plumose anemone, sea stars, and orange sea-pen) may be crushed during installation of piles, the number affected is expected to be negligible given the expected abundance of these species across subtidal benthic habitats in the Inner Harbour of Burrard Inlet. Further, these species are likely to quickly repopulate the affected areas when the piles are removed. No long-term or irreversible residual effects are expected with respect to the sustainability or productivity of local invertebrate and fish populations. Potential effects to marine mammals, birds and/or fish from underwater noise, artificial lighting, or vessel movement are expected to be effectively mitigated during operation of the proposed infrastructure and associated marine traffic. Following removal of the temporary infrastructure, intertidal and subtidal habitats are expected to return to pre-construction conditions within several months or less. For further information regarding the Aquatic Bio-Physical Assessment, refer to Appendix B.

The following key mitigation measures will be implemented to avoid or reduce potential adverse effects to species and habitats resulting from in- and near-water construction activities at the site and operation of the temporary infrastructure.

- Mooring piles and piles to support the temporary trestle and access platform will be installed during the DFO least-risk work window for Burrard Inlet (August 16–February 28).
- A bubble curtain will be installed around piles during impact-hammer pile driving.
- Underwater noise monitoring will be conducted during impact-hammer pile driving to verify that pressure levels do not exceed 30 kPa (fish injury threshold; BC Marine and Pile Driving Contractors Association 2003) outside of the bubble curtain.
- A marine mammal monitor will be onsite to monitor marine mammal exclusion areas during impact-hammer pile driving: 150 m radius around piles for harbour seals; 1,000 m initial radius around piles for cetaceans and marine mammal species at risk, adjusted to meet the 160 dB (marine mammal behavioral disturbance threshold; National Oceanic and Atmospheric Administration [NOAA] n.d.) based on underwater noise monitoring conducted during impact hammer pile driving. Further details of this measure are provided in the Environmental Monitoring section below.
- Impact-hammer pile driving will be restricted to daylight hours to facilitate effective visual monitoring of the 150-m harbor-seal zone and 1,000 m cetacean and marine mammal species at risk zone.

- Construction crews will maintain a 100-m separation distance between the marine environment and fuel or hazardous material storage sites, and oil change and refueling areas, unless otherwise approved by an environmental inspector.
- During periods of bird migration and/or during extreme weather events, bird strike warnings will be issued to marine construction vessels with a request to reduce deck lighting.
- Project-related vessels) will travel at slow speeds (less than 10 knots) and avoid rapid acceleration to limit the intensity of acoustic emissions (both above and below the water surface) and to decrease the likelihood of striking marine mammals, infrastructure or other vessels.
- Appropriate erosion and sediment control measures (e.g., coir logs, erosion control matting, sediment fence and crushed gravel) will be implemented in accordance with a site-specific erosion and sediment control plan during near-water construction activities to limit sediment runoff into the marine environment.

2.4.1.2 Terrestrial

A site visit was conducted on July 10, 2017 to assess existing vegetation and site characteristics. The site substrate is entirely anthropogenic in nature. The previous tenant has removed all buildings and structures, left some paved portions of the site and regraded the remainder of the site with ¾ inch crushed gravel. The area that is proposed to be utilized for equipment parking and materials storage/handling has been denuded of all vegetation by the previous tenant. A 2m wide strip of vegetation (primarily Himalayan blackberry [Rubus armeniacus] and young cottonwood [Populus balsamifera] along the western edge of the property on the bank upslope from Burrard Inlet will be left intact. For further details, please refer to the Terrestrial Bio-Physical Assessment in Appendix C.

2.4.2 Desktop Review of Archaeological Potential

A desktop review of archaeological potential was conducted for the site in June 2017. The tidal and sub-tidal (offshore) area that is to be developed for the Project has been subject to numerous dredging and infilling activities in the past that have significantly altered native sediment and soils. As the site is entirely on a man-made landform, it is assessed as having low potential for unrecorded archaeological sites. No further archaeological work is recommended.

3 CONTACTS AND RESPONSIBILITIES

The successful implementation of the Project environmental program is a coordinated team effort that includes input and review by Project Management, Project environmental team, VFPA representatives, field staff and construction craft workers. Project personnel involved with the planning and implementation of Project construction and the Project environmental program are provided in Table

1. Further details on the roles and responsibilities of key personnel are provided below in Section 3.1.

Table 1: Key Project Construction Personnel

Name	Role	Organization	Phone #
Lorne Caley	Project Director	KLTP	604-315-1152

Jeff Stoos	Marine Construction Manager	KLTP	925-324-6503
Andrew Allan	Contractor Environmental Manager	KLTP	604-317-6886
TBD	Environmental Coordinator	KLTP	
TBD	Environment, Health and Safety Burnaby	Trans Mountain	1-604-268-3008
TBD	Environmental Inspector	Trans Mountain	
TBD	Senior Compliance Advisor	Trans Mountain	
TBD	Environmental Lead	VFPA	

3.1 Environmental Roles and Responsibilities

3.1.1 Contractor Environmental Manager

The Contractor Environmental Manager will plan, administer and authorize the use of resources to run an effective environmental program. The Contractor Environmental Manager will be a qualified environmental professional (R.P.Bio) and will utilize the services of the Environmental Coordinator at their discretion. Responsibilities of the Contractor Environmental Manager include, but are not limited to the following:

- Overall environmental management of the Project;
- Implementation of environmental policies and procedures;
- Coordinate environmental input to construction planning;
- Supervise Environmental Coordinators as necessary to ensure that the environmental goals and objectives of the Project are met in a timely and effective manner;
- Communicate and train on the requirements of this CEMP to project staff and construction craft workers;
- Preparation of environmental documentation in support of environmental permitting/agency acceptance;
- Authority to stop Project work in the event of an environmental non-compliance or potential non-compliance;
- Conduct regular meetings with the construction team and Environmental Coordinator to ensure environmental compliance;
- Final review of the Construction Environmental Management Plan (CEMP) and any the development of any revisions throughout the construction period;
- Overall responsibility for effective implementation of the CEMP;
- Review and quality control of material generated by the Environmental Coordinator and environmental specialists;

- Ongoing review of all environmental documentation to evaluate relevance and effectiveness;
- Development and implementation of environmental training activities;
- Liaise with the VFPA and other regulatory agencies on environmental matters, as required;
- Producing weekly environmental reports;
- Maintaining complete inventory of all environmental records (e.g., reports, photographs, analytical results, incident reports, etc.) relating to the environmental program;
- Participate as required in community consultations on environmental matters; and,
- Identification of resource requirements and project environmental budgeting.

3.1.2 Environmental Coordinator

Environmental Coordinators will verify compliance with the CEMP through surveillance (field) monitoring, under supervision of the Environmental Manager. The Environmental Coordinator will be qualified internal or external, 3rd party resource. The Environmental Coordinators' duties will include, but not be limited to, the following:

- Ensuring that construction staff are aware of the environmental policies and requirements;
- Verifying that all required permits, licenses, and approvals are obtained prior to the start of the applicable construction activity;
- Train field staff and construction craft workers of the implementation of mitigations measures used to protect the environment, as require by the Environmental Manager;
- Be onsite as per the schedule established by the Environmental Manager and Construction Management prior to project start;
- Advise project members if project activities have caused or are likely to cause an environmental incident and make recommendations for corrective action;
- Liaise directly with project members and provide technical advice for the purpose of resolving situations that may impact the environment as they arise;
- Reviewing the work schedule and procedures with regard to present and future construction activities;
- Regularly monitoring fuel delivery and refueling procedures;
- Regularly checking all equipment and vehicles on site for hydrocarbon leaks;
- Ensuring that emergency spill and fire equipment caches are adequately supplied and dated;
- Checking the condition and operational efficiency of all water and sediment retention measures;
- Providing technical assistance on environmental matters to the VFPA, construction staff and regulatory agencies;
- Inspecting all activities during construction, especially in-water works, to ensure compliance with terms and conditions of this CEMP, permits and approvals and the protection of sensitive habitats;
- Documenting construction activities by field notes and photographs;

- Supporting the Contractor Environmental Manager in the production of weekly environmental compliance reports;
- Has the modifying or Halting work authority to ensure that appropriate mitigation measures are in place to protect the environment; and
- Monitoring water and effluent within the project area in accordance with the Water Quality Program, and increasing observations and/or sampling as necessary when activities occur around sensitive areas.

3.1.3 Environmental Discipline Specialists

Specialized environmental consultants will provide environmental services as needed to support environmental management of construction activities. It is anticipated that the following discipline consultants may be needed to support construction of the Project:

- Contaminated sites consultant (e.g., to develop a protocol for managing possible encounters with previously unknown contamination, provide or review contaminated site assessments, coordinate remediation, and other tasks);
- Fisheries and aquatic consultant (e.g., to assess permanent and temporary impacts on aquatic species and habitat under the *Fisheries Act*);
- Wildlife/vegetation consultant (e.g., to provide vegetation/wildlife surveys, define special mitigation and monitoring programs);
- Archaeological/heritage consultant (e.g., to provide assessment as necessary and define procedures in the event that previously undisclosed cultural materials are encountered during construction);
- Noise consultant (e.g., to provide specialized monitoring, noise modeling or technical information in support of the community relations program); and
- Air quality consultant (e.g., to provide air quality monitoring or prepare technical documentation needed to resolve air quality complaints).

3.1.4 Construction Staff Responsibilities

A key component for the implementation of a successful environmental program is an understanding by field crews and supervision of how construction activities impact the environment and mitigations measures to reduce or eliminate those impacts. This CEMP provides guidance to field supervision on those mitigation efforts. Environmental responsibilities of the construction management and field supervision include:

- Becoming familiar with the CEMP, aspects of their work that could have a negative impact on the environment and implementing appropriate mitigation measures to reduce or eliminate those impacts;
- Ensure the field staff and subcontractors are familiar with the CEMP and mitigation measures that are to be used for the construction activities they are responsible for;
- Understand the role of, and be able to take direction from the Project environmental team with respect to environmental protection measures;
- Compliance with all Project permits and approvals; and,

- Report all environmental incidents, in a timely manner, to the Project environmental team and be involved in the corrective actions to prevent re-occurrence of those incidents.

4 RELEVANT ENVIRONMENTAL LEGISLATION

Table 2 provides a list of the relevant environmental legislation and legal requirements applicable to the Project. This table will be revisited and updated as necessary throughout the life of the Project to capture any changes in environmental legislation or changes in construction activities that may trigger any additional regulatory requirements.

Table 2: Environmental Legislation and Legal Requirements

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/Forthcoming; or Requirements Met
Federal			
<i>Fisheries Act</i> (FA - administered by Department of Fisheries & Oceans (DFO) and Environment Canada)	The <i>FA</i> is the main federal legislation providing protection for fish, fish habitat and water quality in Canada. Also, the <i>FA</i> also prohibits the deposit of deleterious substances to water frequented by fish.	The work requires pile installation below the high water mark (HWM). Also, stormwater will be generated during construction.	QEP has consulted with DFO and has been advised to complete a self-assessment to determine if the Project will cause serious harm to fish that support a commercial, recreational or aboriginal fishery. The QEP has also decided to submit a Request for Review to the DFO for this project. The QEP self-assessment has been initiated and can be provided to VFPA, upon request, once completed. An Erosion and Sediment Control Plan that outlines the mitigation measures that will be implemented to prevent the release of sediment laden water to Burrard Inlet is provided in Section 5.6 of this CEMP. Protection measures for marine fish and mammals is covered in Section 5.12 Sensitive Habitat Features and Species of this CEMP.
<i>Canada Shipping Act, National Spill Response Protocol</i>	The <i>Canada Shipping Act</i> is Transport Canada's regulatory framework surrounding marine pollution and its enforcement. In the case of a report of pollution in the water, including oil or fuel spills, Canada operates under the National Spill Response Protocol, which	The Project has the potential for hydrocarbon spills to Burrard Inlet.	An Environmental Emergency and Spill Response Plan has been developed for the construction phase of the Project and is provided in Section 6.2 of this CEMP.

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/Forthcoming; or Requirements Met
	specifies that the Canadian Coast Guard is responsible for all spill response and recovery in the marine environment.		
<i>Navigation Protection Act (NPA - administered by Transport Canada)</i>	The <i>NPA</i> is the main federal legislation that protects the public right to free and unobstructed passage over navigable waters.	The Project includes the construction of a new trestle dock facility and mooring dolphins.	The project will be required to submit a 'Notice of Works' to the Navigation Protection Program (NPP). Depending on the NPP review, an 'Application for Approval' may be also required. An 'Application for Approval' will have conditions that need to be followed to ensure compliance with the approval.
<i>Migratory Birds Convention Act (MBCA)</i>	The <i>MBCA</i> is the main federal legislation that protects migratory birds, eggs and nests.	The work does not require vegetation clearing	Clearing activities will be conducted outside on the bird breeding season (April 1 to July 31). Buildings to be demolished will be surveyed for swallow nests prior to demolition. An ongoing swallow nesting monitoring program will be in place throughout project construction.
<i>Species At Risk Act (SARA)</i>	<i>SARA</i> is in place to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated, endangered, or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened.	Various construction activities may impact some <i>SARA</i> listed species or their habitats.	A list of <i>SARA</i> listed species is provided in the Project Biophysical Report. The risk to those species will be evaluated and appropriate mitigation efforts are provided in the Project Biophysical Reports.
VFPA Non-Road Diesel	The NRDE fee recovers costs associated with	The NRDE Fee is applicable to all	Responsible parties must not introduce non-road diesel engines

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/Forthcoming; or Requirements Met
Emissions (NRDE) Regulation	managing air quality and reducing diesel particulate matter emissions	parties granted the right by VFPA to occupy lands owned, managed, or administered by VFPA.	that are “non-certified” (Tier 0) or certified as “Tier 1” without prior written approval from VFPA.
Provincial			
Spill Reporting Regulations of the <i>Environmental Management Act</i> (EMA - administered by the Ministry of Environment)	The regulation establishes a protocol for reporting the unauthorized release of substances into the environment as well as a schedule detailing reportable amounts for certain substances for sites having Provincial jurisdiction. The same protocol will be used for the 2115 Commissioner Street site (Federal jurisdiction) with the reports going to VFPA	Substances (e.g., hydrocarbons) that may be harmful to the environment will be used during the construction period of the Project.	A comprehensive emergency and spill response plan has been developed for this CEMP (see Section 6). All spills over the limits specified in the regulation will be reported to the VFPA
Contaminated Sites and Hazardous Waste Regulations of the <i>EMA</i>	These regulations govern the handling, storage, transportation, treatment and disposal of contaminated material and hazardous waste.	Unexpected previously contaminated material may be found within Project boundaries. Hazardous waste (e.g., used oil) will be generated during construction.	A hazardous waste and contaminated material management plans are contained within this CEMP (Sections 8 and 5.88, respectively). A BC Waste Generator number will be obtained for the life of construction.
<i>Wildlife Act</i>	The <i>Wildlife Act</i> protects a bird or its eggs, the nest of eagle, peregrine falcon, gyrfalcon, osprey, heron or	The work does not require vegetation clearing	Clearing activities will be conducted outside on the bird breeding season (April 1 to July 31). A pre-construction nest survey will be conducted to determine the

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/Forthcoming; or Requirements Met
	burrowing owl and the nest of a bird when the nest is occupied by a bird or its egg.		presence of any eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl nest.
<i>BC Heritage Conservation Act</i>	The Heritage Conservation Act provides for the protection of British Columbia's archaeological resources	The site is considered to have low archaeological potential and conflicts with archaeological sites in considered unlikely. A Heritage Resources Discovery Contingency Plan is in place in the unlikely event that potential archaeological materials are encountered during construction	If additional archaeological work is necessary, that work will conform to the terms of the relevant Heritage Conservation Act permit and will be documented in the final report to be reviewed and approved by the BC Archaeology Branch (MFLNRO). .
Regional			
Metro Vancouver Municipal Solid Waste and Recyclable Material Regulatory Bylaw #181, 1996	Metro Vancouver administers and enforces the disposal of solid waste and recyclables that are received at their transfer stations and landfills.	The Project will be generating solid waste and recyclables during construction.	To minimize the production of solid waste from construction, all waste will be segregated on site and recyclables (e.g., wood, metal, and organic waste) will be transported to an appropriate facility. A Waste Management Plan is provided in Section 8 of this CEMP.
Municipal			
City of Vancouver (CV) Noise Control Bylaw 1987 #6555	The CV Noise Bylaw restricts the continuous sound levels of construction equipment and the hours of construction activities.	Heavy construction equipment will be used during construction of the Project	Construction activities will comply with CV Noise bylaw that limits construction activities between the hours of 7:30 am to 8:00 pm Monday through Friday and 10:00 am to 8:00 pm Saturday unless an

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/Forthcoming; or Requirements Met
			exemption has been provided by the CV.

5 PROJECT MITIGATION MEASURES AND ENVIRONMENTAL SPECIFICATIONS

5.1 Temporary Construction Lands and Infrastructure EPP

The purpose of the Temporary Construction Lands and Infrastructure EPP is to communicate Trans Mountain's environmental procedures and mitigation measures to Project construction and Inspection personnel in a clear, concise format. These potential environmental procedures and mitigation measures are to be implemented during construction of temporary construction lands and infrastructure to avoid or reduce potential adverse environmental effects. Specifically, the Temporary Construction Lands and Infrastructure EPP:

- identifies mitigation measures to be implemented during development of the temporary construction lands and infrastructure;
- provides instructions for carrying out construction activities in a manner that will avoid or reduce adverse environmental effects; and
- serves as reference information to support decision-making and provides direction to more detailed information (e.g., resource-specific mitigation measures, management and contingency plans).

This Temporary Construction Lands and Infrastructure EPP is intended to be a comprehensive compilation of all environmental protection procedures, mitigation measures and monitoring commitments, as set out in Trans Mountain's Application, its subsequent filings, or as otherwise committed to during the NEB proceedings. Trans Mountain confirms its intention to implement all of its commitments pursuant to NEB Conditions 2 and 6.

5.2 General Practices

For this Project, environmental process, practice and risk management will be based on the concepts of "avoidance of impacts", "continual improvement" and "check and act" throughout the duration of the Project.

The first step in environmental risk management is the "avoidance of impacts" during design. Should avoidance in design not be feasible, then a feedback loop starts and input by the environmental team is applied in order to minimize impacts. The revisiting of these impacts at the various design stages creates an adaptive management feedback loop aimed at "continual improvement".

The concept of "continual improvement" requires sequencing of tasks whereby Project team members are assigned the responsibility of "checking and acting" upon construction features that may impact the environment. Key stages in the "check and act" portion of the process during construction are environmental monitoring and reporting. Monitoring and reporting provides further opportunity for continual improvement during construction where environmental mitigation measures can be revisited and refined to provide the required environmental protection goals. Environmental monitoring and reporting identify the mitigation/avoidance strategies to ensure that goals and objectives set out in the CEMP, VFPA permit and applicable regulatory legislation are addressed.

Task sequencing for each stage in the process will aid in preventing lengthy delays in environmental review, regulatory permitting, day-to-day construction activities, and subsequent cost increases (i.e., risk management). This process facilitates environmental issue resolution while providing the mechanism for continual improvement.

To ensure the successful application of this procedure will depend on the execution of four general environmental processes: planning, training, monitoring and reporting.

5.2.1 Work Plans

It is critical that environmental protection and mitigation strategies developed by the Environmental Team are appropriately conveyed to the field staff, in a timely manner. The development of activity and or site specific environmental protection measures in the work plans for implementation in the field is an important step in communicating these measures to field crews. The Construction Team will develop specific construction work plans that identify and incorporate environmental constraints, regulatory commitments and mitigation strategies. The environmental input section is a component of the construction work plan and is a summary of the environmental mitigation measures related to the construction work being performed.

Once the work plan is complete, it will be reviewed by the Environmental Team and site superintendent to ensure that environmental compliance is achieved. The final version of the work plan will be presented at the pre-activity meeting with the Environmental Team and construction staff in attendance.

5.2.2 Environmental Training

Environmental training, education and awareness of all Project personnel form the cornerstone of a strong environmental program. The Construction Team provides training for its workers, including subcontractors as applicable, designed to:

- Increase employee awareness and appreciation of the environment and the natural resources likely to be affected during construction activities; and
- Familiarize workers with the negative impacts their actions can have on the environment and how these can best be avoided or minimized.

The training program is intended to facilitate worker understanding of the environmental context of the Project and clarify the role of the trainees in achieving at least minimum environmental requirements of the Project. Training is intended to increase environmental accountability of individual workers respecting protection of the environment; therefore environmental training is mandatory for all personnel.

The environmental training and awareness program consists of three levels, each targeting a different audience:

- Advanced Training on the CEMP conditions, VFPA Permit requirements and applicable guidelines for construction managers as well as site supervisors;
- Basic Training for all other site workers (e.g., as part of more general Site Orientation); and
- Tailgate training sessions for individual crews to address specific construction methods or environmental issues.

Records will be kept for Advanced and Basic Training that summarize the objective or purpose of the training, the type of material covered, attendance, as well as minutes/notes where appropriate.

5.2.3 Environmental Monitoring

Environmental monitoring is a key step in environmental process and risk management for the Project. Not only is environmental monitoring used to review, observe and report on environmental impacts resulting from construction activities, it is also a critical tool in assessing potential risk during pre-construction

planning. To reduce environmental risk, environmental monitoring needs to anticipate potential impacts and identify mitigation/avoidance strategies to ensure that goals and objectives set out in the CEMP and regulatory agency approvals are addressed during all project phases.

Monitoring of construction activities in sensitive areas or in-water works will be on a full-time basis. For the other activities, the intensity of environmental monitoring depends upon their sensitivity and potential impacts and will be set by the Environmental Manager in consultation with the VFPA and Construction Management Team. For example, environmental monitoring will be on a full time basis during vegetation clearing.

Further details on the environmental monitoring roles and responsibilities of the Contractor Environmental Team are provided in Section 3.1 of this CEMP.

5.2.4 Environmental Reporting

A large component of the environmental management for the Project is the production of effective environmental reports. These reports facilitate the transfer of information between the Construction Team, VFPA, and regulatory agencies. Clear, concise reporting during all Project phases and activities will form the basis for environmental issue identification, resolution, and compliance auditing. The Construction Team will implement an environmental reporting structure that addresses activities during Project construction as follows:

- Environmental incident and corrective action reports for each environmental incident;
- Weekly environmental monitoring reports; and,
- Environmental specialist reports (e.g., noising monitoring) specific to an activity or environmental feature.

All these reports will be submitted to the VFPA and the applicable regulatory agency(s), if required.

5.3 Site Access, Mobilization and Laydown Areas

Our mobilization plan will capitalize on existing site conditions. Minimizing impacts to permanent features and setting up temporary facilities in strategic locations will result in a safe, efficient construction site. Three important aspects to a successful mobilization and effective construction site are office locations, laydown areas, and site access.

5.3.1 Site Laydown

Site laydowns will be located in areas that remain undisturbed for the majority of the project duration.

The laydown will be located at the SW portion of the site. It consists of connex storage containers, officer trailer, lunch trailer, wash cars, and vinyl shelter. This area has suitable access for off-loading materials and the perimeter of the property will be contained with chain link fencing for added security.

5.3.2 Site Access

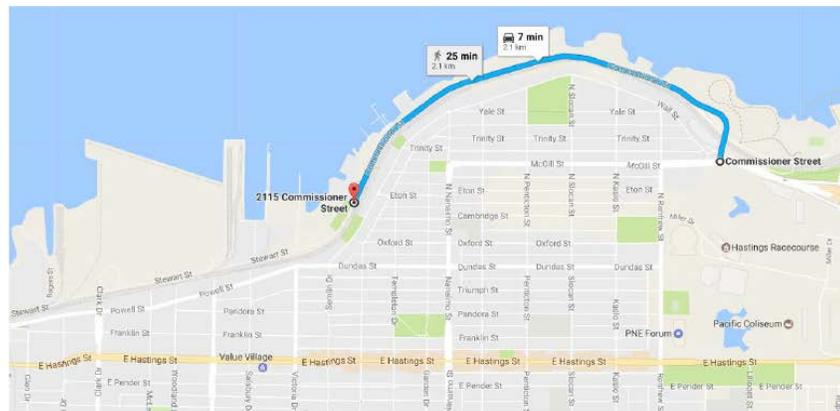
Commissioner street will primary be used to gain access to both the NE and SW portion of the 2115 Commissioner Street site.

In the NE section, the lot is primarily occupied by parking stalls and temporary trestles to transport marine workers. This site can be accessed by the man gate and double vehicle gate on Commissioner Street. The layout and configuration of the lot is unlikely to change throughout the duration of the project.

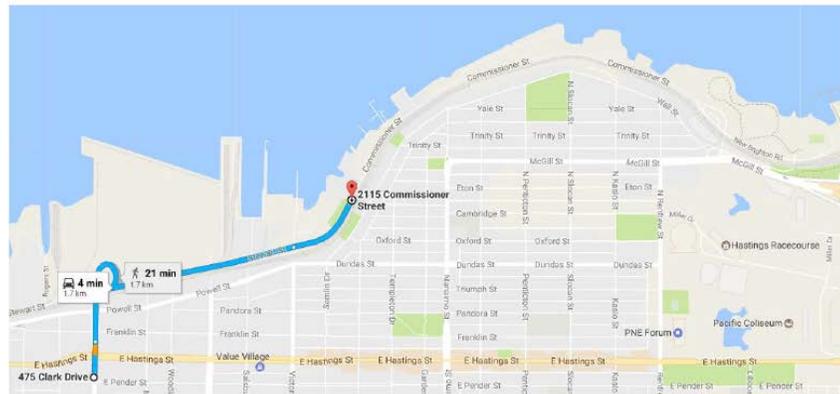
In the SW section, the lot is primarily used for equipment and material laydown combined with office site trailers. The configuration of this area is likely to change depending on the phase of the project. A crane will be stationed at the temporary trestle to help load and off-load material from barges. To ensure the safety and stability of the crane, an engineered crane pad will be constructed using granular fill in area where the crane may operate. Similar to the NE site, the lot can be accessed through the double vehicle gate and man gate on Commissioner Street.

Access to the old wharf section located between the NE and SW sites will be restricted due to the existing conditions. The perimeter of the site will be secured with chain link fence and concrete barriers to minimize the possibility of unauthorized access.

**SITE ACCESS
OPTION A –
MCGILL STREET**



**SITE ACCESS
OPTION B –
CLARK DRIVE**



Figures 3a and 3b: 2115 Commissioner Street – Site Access Options

Figure 3: Site Access

5.4 Air Quality

Construction related impacts are generally of short-term duration but may still cause adverse air quality impacts. Air pollutants generated during construction generally fall into one of two categories – airborne dust and vehicular exhaust emissions.

Airborne and fugitive dust can be generated during dry periods and arise from disturbances of soil and construction aggregates, vehicular traffic on temporary unpaved roads, and wind erosion of stockpiles.

Fugitive dust and airborne particulates will be controlled and minimized by implementing best management practices including:

- Notify landowners and/or occupants of the potential to be affected by emissions from construction activities prior to commencement of these activities in proximity to lands owned by the respective landowners and/or occupants.
- Restrict the duration that vehicles and equipment are allowed to sit and idle to less than 1 hour, unless air temperature is less than 0°C.
- Establish speed limits, approved by Trans Mountain, on the pipeline construction footprint and access roads. Post signs stating the applicable speed limits for construction traffic to avoid wildlife injury and mortality, maintain soil structure and reduce dust.
- Apply only water or non-toxic and non-persistent chemical products approved by an Environmental Inspector or designate to access roads for dust control at park locations or resource-specific features including agricultural crop production areas, especially berry crops.
- Do not apply dust control chemicals to roads during windy conditions or within 300 m of a watercourse, wetland or lake or sensitive agricultural crops (e.g., berries, nurseries and organic farms). Dust control chemicals are to be approved by an Environmental Inspector, or designate, in advance of application.
- Site Preparation
 - • Grade the construction site in phases.
 - • Stabilize surfaces of completed earthworks with vegetation, if appropriate.
 - • Compact distributed soil.
- Storage Piles and Material Handling
 - Minimizing the handling of soils and aggregates (e.g., by avoiding double handling of spoil, covering truckloads of fine-grained materials during hauling);
 - Minimize generation of road dust (e.g., minimize the time that unpaved surfaces are exposed and use watering or sweeping);
 - During dry conditions and when necessary, control dust sources (e.g., minimize the time that unpaved surfaces are exposed, water or cover potential dust sources, sweep paved surfaces);
 - As necessary, use environmentally acceptable dust suppressants, approved by the Environmental Inspector, or water to control dust on access roads, laydown areas, work areas, and disposal areas;
 - Prefer the use of water, with consideration for water conservation, drainage and sediment control where appropriate;
 - No burning of oils, rubber, tires and any other material will not take place at the site;
 - Stationary emission sources (e.g. portable diesel generators, compressors, etc.) should be used only as necessary and turned off when not in use;
 - Track out best management practices of vehicles leaving the site will be used to reduce the dispersion materials and debris from the site;

- Compact disturbed soils;
- Reduce activities that create fugitive dust during windy conditions;
- Manage storage piles (e.g., by shaping them, installing enclosures or coverings around piles, conducting storage pile activities downwind of sensitive receptors);
- Control mud and dirt track-out from construction sites; and,
- Minimize drop height at material transfer locations (e.g., when loading soil onto haul trucks).

Construction equipment and processes that generally result in sizable non-fugitive emissions include drills, excavators, crawler tractors, loaders, graders and marine vessels. BMPs that will be used to mitigate adverse air quality effects from construction include:

- Implement a vehicle/equipment anti-idling policy for construction equipment and vehicles;
- Make use of legislated best available technologies and practices to reduce emissions;
- Control point-source emissions e.g., by implementing applicable measures recommended by Metro Vancouver and Fraser Health Authority;
- Minimize cold starts and operate equipment at and within load tolerances and rating;
- Maintain all equipment in good working order and used at optimal loads to minimize emissions; and,
- Perform routine checks of the exhaust system of all equipment to identify actual or potential deficiencies (daily visual inspection by operator, 500hr preventative maintenance performed by maintenance department).

A qualitative air quality monitoring program (i.e., visual observation of air quality) will be implemented on an ongoing basis to guide the implementation of BMPs and check on their success or failure. Qualitative monitoring will focus on activities that have the greatest potential impact to air quality. All non-road diesel equipment will be in compliance with the VFPA Non-Road Diesel Engine Regulatory Program.

5.5 Noise and Vibration

The goal of the Noise Management Program is to guide measures that minimize community impacts and also achieve community acceptance of unavoidable demolition, construction and operational noise. An Operational Noise Study including mitigation measures is provided in a separate report submitted to the VFPA. Noise complaints will be handled as per the community response plan.

Project construction will primarily entail the following noise generating activities:

- Sub-excavation of soils (e.g., using excavators);
- Trucking of materials along haul routes to and from site;
- Ground improvement pile driving (e.g., using drill rig, vibratory hammer, impact hammer),
- Grading and sub-base construction (e.g., using dozers, excavators, rollers and compactors);
- Some construction materials could come in by barge; and,
- Local contractor adjacent to site may be used for pile driving activities and material delivery.

Mitigation measures will include the preparation and implementation of noise management procedures, best efforts to target noise emission levels of equipment, and selection and implementation of activity and

location specific BMPs to control demolition and construction noise emissions. Examples of key noise mitigation measures are as follows:

- Project-related vessels will be maintained in good working condition to reduce acoustic emissions (both above and below the water surface).
- Use vibratory methods of pile installation, to the extent feasible (*e.g.*, where geophysical conditions allow). Limit in-water impact pile driving to daytime only.
- Construction activities will be primarily conducted from Monday to Saturday between 7:00 am and 8:00 pm. However, some construction activities may need to be conducted outside of these hours in which case a variance request will be made to the VFPA prior to the start of these activities;
- Affected community and CV will be notified of any particular noisier activities that may be forthcoming. These activities may need to require monitoring to ensure compliance with the local noise bylaw;
- Maintain construction equipment in good working condition;
- Operate equipment at or within load tolerances and ratings;
- Focus maintenance on lubrication, replacement of worn parts, exhaust deficiencies;
- When practical, shut down heavy equipment not in active use;
- Avoid unnecessary engine revving and use of engine brakes;
- Minimize use of back-up beepers providing in compliance with WorkSafe regulations;
- Select travel routes to avoid noise-sensitive receptors;
- Relocate or reorient stationary equipment so as to engage natural noise screening/dampening features;
- Use special measures such as temporary noise barriers for noisier demolition and construction activities;
- Communicate with the public regarding work procedures and scheduling of noisy activities and,
- Train all personnel on noise mitigation strategies within the noise mitigation plan.

5.6 Machinery and Equipment

A variety of equipment and machinery will be used on site during construction of the Project. Examples may include crawler cranes, rubber tired loaders, bull dozers, articulated dump trucks, track and rubber tired excavators, etc. A number of small pieces of equipment such as fork lifts, generators, pick-up trucks and light plants will also be used during construction. A list of all equipment and machinery to be used during construction will be provided to the VFPA prior to construction. In addition, all non-road diesel equipment will be subject to the VFPA Non-Road Diesel Emissions (NRDE) Program which prohibits the addition of Tier 1 and older diesel engines without prior Port Authority approval. As such, the Construction Team will complete and submit the NRDE Annual Reporting Tool for applicable equipment once construction commences.

All major equipment maintenance repairs will be done off site.

The implementation of some basic mitigation measures will avoid or minimize impacts resulting from operation and storage of equipment during construction. These include:

- Inspection of all equipment prior to mobilization to site to ensure they are in good operating order and maintained free from leaks, excess oil and grease invasive species and noxious weeds;
- All equipment will undergo a preventative maintenance (PM) program Preventative maintenance is typically scheduled for every piece of equipment on the project after a defined number of hours (typically every 250 or 500 hours). During these “PMs” the entire equipment is thoroughly checked and worn parts (though not defective) will be replaced. Preventative maintenance is carried out by qualified maintenance personnel.
- All construction equipment (including pick-up trucks) will have a spill containment kit onboard at all times;
- Refueling will only occur as outlined in the Fuel Management Plan in this CEMP (Section 7);
- All equipment will undergo a documented daily inspection performed by the operator. These inspections can identify potential spill sources (e.g. defective hoses or fittings) at the start of each shift. These inspection forms are reviewed by the maintenance department and the observations by the operator will be addressed; and,
- When practical, light spill from light plants or temporary light poles will be minimized by directing lights downward and placing task lights as close to the operation as possible.

5.7 Erosion and Sediment Control

This Erosion and Sediment Control Plan describes the general approach that will be implemented so that water that flows, or is discharged, from construction sites complies with applicable water quality standards. For the purpose of this plan, construction water is defined as run-off that is produced as a result of various construction activities (e.g. from dewatering work sites, excess water from drilling and ground densification) and surface run-off from rain events.

The details will be included in the specific Work Plans for each area and the functionality of the control plan is confirmed by the Environmental Team during the Pre-Activity Meetings and it is the duty of Field Supervisors to ensure the work is completed as per the plan.

Construction water emanating from the site will be monitored to confirm compliance prior to discharge to the natural environment. Measures will be implemented onsite to remedy deficient water quality induced by construction. The Plan also provides general and site specific measures for controlling sediment laden flows emanating from disturbed areas or from dewatering. It focuses on prevention and correction of potential erosion and sediment issues relating to preload and surcharge placement, vegetation removal and stripping, grade construction, cut faces, fills, ditching, and other areas requiring temporary disturbance of potentially erodible materials.

Construction affected surface water will meet specifications prior to discharging to the receiving waters. Adaptive management will be used to correct measures that fail to redress water quality deficiencies. The Construction Team’s strategy is:

- Prepare site specific Sediment and Drainage Management Plans (SDMPs) in tandem with development of Work Plans and Work Methods with input from the Environmental Team;
- Identify requirements for additional water quality monitoring prior to and during construction to ensure preventative and mitigation measures can be taken as appropriate, to avoid impacts to water quality;

- Identify potential water quality contaminants of concern generated by construction activities and associated preventative and mitigation measures;
- Identify areas prone to sedimentation in more detailed, site specific plans or work methods, as applicable;
- Check that implemented BMPs are functioning as designed and that corrective actions are being taken when required. BMP implementation and maintenance checks are to be conducted at least weekly and after major rainfall events. These checks will be documented in the Weekly Monitoring Reports;
- Apply federal water quality guidelines and objectives in evaluation of the water quality samples collected before, during and after construction;
- Monitor levels of suspended sediments, using turbidity as a field measure, in accordance with applicable water quality objectives using federal methodologies for turbidity monitoring; and,
- Comply with environmental requirements and BMPs in order to avoid impacts to water quality.

5.7.1 Best Management Practices

The selection and implementation of environmental best practices will consider such factors as: the size of work sites; activity associated with particular construction sites; proximity to environmentally sensitive features such as fish-bearing watercourses; work site gradient; nature of disturbed soil material, predicted discharge volumes and flow rates; and other factors. Measures will be adjusted in response to changing conditions or to correct environmental protection deficiencies.

BMPs will be implemented mainly in the following contexts:

- To manage drainage and storm flows in and around work sites;
- To prevent discharge to the environment of water that may be produced as a result of various construction activities (e.g., from dewatering work sites, excess water from drilling, etc.);
- To prevent erosion at discharge points e.g., by maintaining or reducing existing flow velocities and/or by providing dissipation measures; and
- To maintain water quality and flow volume at discharge points.

5.7.1.1 Water Management

Water discharged from a construction site into watercourses, ditches or stormwater drainage systems will be monitored to confirm that suspended solids, pH and other water quality parameters meet required environmental performance indicators. Water quality monitoring frequency and parameters requirements will follow the applicable permits and environmental legislation.

5.7.1.2 Erosion Prevention and Control

Best management practices for erosion prevention and control include, but are not limited to, the following:

- Minimize the area disturbed by construction, e.g. by minimizing clear and grub areas;
- Minimize soil disturbance and soil compaction;
- Minimize the volume of overland flow entering, or flowing through, construction areas;

- Regardless of the proximity to watercourses, applicable BMPs for surface water quality and sediment and erosion control will be implemented;
- Divert surface water around disturbed construction areas, stockpiles or lay down areas. Diversion should avoid significant alteration of pre-existing down slope drainage;
- Roughen the surfaces of compacted, disturbed and exposed soils to increase infiltration to ground and break up or slow down sheet flows (e.g., implement “cat tracking”);
- Minimize soil stockpile areas and volumes, where possible, particularly during inclement weather and/or when working in environmentally sensitive areas;
- Avoid placing soil stockpiles on sloped terrain;
- Stockpile soils as far away as possible from watercourses or other flowing conveyances that have direct hydraulically connection to sensitive receiving waters;
- Minimize slopes of disturbed areas and stockpiled material; maintain the natural angle of repose;
- Ensure that sufficient filter cloth, rock, seed, drain rock, culverts, staking, and other materials used for erosion prevention or control are readily available on site;
- When installing or relocating utilities, minimize the length of trench exposed at any given time;
- Check erosion control measures regularly (at least once a week), with frequency based on weather conditions, risk, and sensitivity of the area, and correct deficiencies without delay;
- Minimize vehicle access routes into working areas;
- Discharge points have dissipation measures implemented; and,
- Maintain or reduce existing flow velocities to stop erosion at discharge points, by roughening the surface, (e.g. by placing boulders and rocks at hose outlets to disperse flow, or have hoses discharge under water; for channel flow velocity reduction place check dams).

5.7.1.3 Sediment Control

The construction team will implement appropriate sediment controls to achieve water quality requirements for discharge to local watercourses, drainage ditches or storm sewers. As required, guidance on sediment control implementation will be provided by the Environmental Manager, Environmental Coordinator or other suitably qualified personnel. Measures include, but are not limited to, the following measures:

- Silt fencing around stockpiled spoils or disturbed areas as necessary;
- Check-dams or gravel berms in drainage channels;
- Covering erodible materials with tarp or other appropriate impervious material;
- Storm drain inlet protection (e.g., using catch basin screens or filter socks);
- Temporary sediment control ponds or traps, or storm water interceptors;
- Undertake wheel washing primarily in centralized median locations to remove sediment from transportation vehicles and prevent offsite tracking of sediment
- Infiltration galleries around dewatering pumps to remove sediment; and
- Street sweeping to remove loose sediment from impervious or paved surfaces.

5.8 Contaminated Soil and Groundwater Management

In all situations, contaminated soil and groundwater will be handled, transported, disposed of and documented in accordance with the provincial *Environmental Management Act* including the Contaminated Sites Regulation and Hazardous Waste Regulation. A qualified environmental professional in contaminated sites management will oversee all contaminated soil and water activities.

5.8.1 Recognition and Response

5.8.1.1 Identification of Contamination

Soil, surface water and groundwater contamination can generally be recognized by one or more of the following:

- unusual, hydrocarbon or chemical odor;
- visual sheen;
- visual free product (oil or other product);
- visual staining. and/or
- high soil vapour concentrations.

Stop work in the immediate area where contamination is identified during the construction phase of the Project to allow an assessment to be undertaken of the contaminated area.

5.8.1.2 Notification Framework

Upon the identification of contamination, work in the area will cease immediately and the Environmental Inspector will be notified. The Environmental Inspector will immediately notify the Senior Compliance Advisor of the discovery. The Senior Compliance Advisor will ensure the timely notification to the NEB and other Appropriate Government Authorities.

A Contaminated Sites Resource Specialist with experience in contaminated sites will be contacted and required to be present at the identification site to verify the indications of potential soil and groundwater contamination (i.e., sheen and adjacent soil staining) and assist in monitoring and mitigation.

5.8.1.3 Health and Safety

Upon discovery of contamination, the health and safety of personnel and the public is the first priority. Contractors and personnel on-site will suspend all work in the area, shut equipment down and immediately notify the Construction Manager or designate and an Environmental Inspector. Appropriate personal protective equipment, will be worn and all reasonable measures will be taken to ensure that health and safety of anyone in the immediate area is preserved. Personnel and Contractors will employ all measures and requirements outlined in Construction Health and Safety Management Plan as well as any other measures or requirements.

5.8.2 Interim Mitigation

The Environmental Inspector and Contaminated Sites Resource Specialist must be consulted when determining the necessary mitigation measures that are to be implemented when it is safe to do so. In all instances, the migration of the contamination from the disturbed area must be minimized. Mitigation measures may include:

- segregating contaminated soil for later sampling and/or analysis and disposal;
- placing contaminated soil onto an impermeable surface;
- covering contaminated soil with an impermeable cover in cases where precipitation may cause runoff;
- constructing berms to control runoff, in cases where runoff is imminent;
- stopping contaminated water discharge;
- storing contaminated water in tanks for later sampling and/or analysis and disposal; and
- if sampling is required, laboratory analytical parameters for soil and groundwater should be based on site history and land use. Potential contaminants of concern are outlined in the Contamination Identification and Assessment Plan (Volume 6 of the Environmental Plans).

5.8.3 Contamination Management Requirements

Excavations in which contaminated soil and/or groundwater has been discovered must not be backfilled until authorization has been given by the Construction Manager and Environmental Inspector. Soil brought on-site to fill excavations must be approved by the Environmental Inspector prior to use.

Contaminated soil and water must not be transported off-site or disposed of until analytical results have been received as per applicable federal and provincial regulations and as outlined in the Contamination Identification Assessment Plan (Section 3.0 of Volume 6 of the Environmental Plans). The Construction Manager and the environmental Inspector will provide notification as to when excavations can be backfilled.

5.9 Vegetation and Wildlife Management

Given the historic industrial use of the Site impacts to terrestrial habitats and wildlife are deemed to be very low. The site is predominantly paved or graveled with sparse row of vegetation. The terrestrial habitat biophysical assessments for the project provides further detail on the species composition and maturity of this strip of vegetation. The following key mitigation measures will be implemented to avoid or reduce potential adverse effects to species and habitats. These measures include:

5.9.1 Vegetation

- Keep vegetation clearing at a minimum with particular attention near watercourses and Environmentally Sensitive Areas (ESAs);
- No vegetation will be felled into a watercourse;
- Stage clearing to provide maximum erosion protection while still allowing construction to proceed.
- Conduct pre-clearing surveys for any rare or sensitive species;
- Prepare a clearing and grubbing plan in consultation with the Environmental Manager;
- Mark the clear and grub, “No Disturbance”, and “Vegetation to Remain” boundaries on the environment construction drawings;
- Flag or sign “No Disturbance” and “Vegetation to Remain” areas (e.g. 30 m buffer around designated watercourses and ESAs) in the field prior to clearing and inspect weekly;
- Maintain the appropriate ESA-specific buffer zones for clear and grub around designated watercourses (30 meters) and ESAs (e.g. 30 meters for songbirds) during clear and grub activities until ready to proceed with earthwork and stabilization (i.e., staged approach);
- Do not fell timber into a watercourse unless safety considerations dictate otherwise or unless approved by Environmental Coordinator;
- The Construction Team will notify the Environmental Manager upon the discovery of rare or sensitive species – the Environmental Manager will in turn notify the VFPA;
- If wood waste is stored on site, store it in a well-drained location, free of standing water, and
- All invasive plant species will be disposed of in accordance with the local municipal Green Waste Program and at a facility equipped to handle invasive plant waste.

5.9.2 Wildlife

- All vegetation clearing will be conducted outside of the bird breeding season (April 1 to July 31);
- Maintain all construction sites free of wildlife attractants such as food, garbage, petroleum products or other materials with a strong odor;

- It is noted that birds may nest in construction equipment (e.g., on cranes, formwork, machinery, temporarily stored materials and other construction infrastructure). Inspection of work areas will occur regularly throughout the bird breeding season to identify birds attempting to nest as early as possible. Should breeding behavior be identified, a specific management plan will be developed by a qualified specialist and in consultation with the VFPA and appropriate regulatory agencies to ensure compliance with the Migratory Birds Convention Act;
- Where garbage containers are required, ensure containers are inaccessible to wildlife; and,
- Do not discharge concrete truck wash water directly to ground. Capture and remove wash water for treatment and disposal at an approved offsite facility (albeit small quantities of wash water can be treated onsite).

5.10 Marine Works

A temporary trestle dock is required to support the marine off-loading facility and laydown yard for the project. The construction of the dock will include in-water piles to support and the temporary trestle and engineered access ramp.

The following mitigation measures will be utilized for marine construction activities:

- Conduct pile installation activities in accordance with applicable permits and/or approvals.
- Use a vibratory method of pile installation preferentially over an impact hammer, where feasible, and in accordance with engineering design criteria, to reduce the intensity of underwater noise and pressure emitted to the marine environment.
- Where an impact hammer is required for pile installation, deploy a bubble curtain around the full wetted length of the pile to reduce underwater noise and pressure levels.
- Upon commencement of impact pile installation or recommencement of such activities after a delay of 30 minutes or more, conduct a pile installation ramp-up procedure starting with less frequent impact strikes of lower force.
- Monitor underwater noise and pressure levels outside of the bubble curtain throughout impact pile driving. If monitoring indicates an exceedance of 30 kPa (≈ 209.5 dB re 1 μ Pa [peak]) during the DFO least risk window for Burrard Inlet (August 16 to February 28) or 22.5 kPa (≈ 207 dB re 1 μ Pa [peak]) outside of the DFO least risk window for Burrard Inlet (March 1 to August 15), or a fish kill is observed, stop impact pile driving immediately and review and modify methods, as appropriate, in consultation with DFO.
 - If possible, Impact pile driving operations will commence inside the least-risk window, to allowing the testing and adaptation of mitigation measures, necessary to meet these thresholds.
 - If, during impact pile driving operations outside of the least-risk window, the underwater noise threshold is exceeded or expected to be exceeded, the following list of contingency measures may be implemented.
 - Verify bubble curtain installation and adjust flow rate.
 - Adjust energy levels on impact hammer – Note that this must be done in consideration of geotechnical design criteria.
 - Install additional bubble curtain ring(s)
 - Transfer the bubble curtain from the WMT operation to the Commissioner Street Site Yard.

- Prior to the commencement of impact pile driving, conduct visual monitoring (by trained, qualified personnel) for cetaceans and marine mammal species at risk within an initial marine mammal exclusion zone, set to a radius of 1 km from active locations of impact pile driving. Conduct simultaneous visual monitoring within a harbour seal-specific exclusion zone, set to a radius of 150 m. Impact pile driving may only commence if no marine mammals are observed within their respective exclusion zones for 30 minutes prior to the start of the activity. The exclusion zone for cetaceans and marine mammal species at risk will encompass the area within which underwater noise levels exceed 160 dB re: 1 µPa. Underwater noise level field verification will be conducted during the first several days of impact pile driving to define the radius of this zone.
- Conduct field verification of underwater noise levels when there are changes to impact pile driving equipment (e.g., hammer size and pile size) or substantial changes to pile locations to allow for adjustments to the radius of the cetacean and marine mammal species at risk exclusion zone.
- Conduct constant visual monitoring of the marine mammal exclusion zones during impact pile driving. If a cetacean or marine mammal species at risk, or a harbour seal, is observed within its respective exclusion zone, temporarily suspend impact pile driving (or reschedule if deemed necessary) until the marine mammal(s) has left the exclusion zone or does not reappear within 30 minutes.
- Pile-driving in open water will typically occur during the window of least risk for impacts to fish and fish habitat (August 16 to February 28).
- If in-water pile-driving occurs outside of the least-risk window it will be conducted in accordance with the DFO Letter of Advice (17-HPAC—1324), dated January 17, 2018, or as otherwise previously approved by DFO (VFPA will be notified prior to construction for any determination in this regard);
- The area of pile removal will be surrounded by a containment boom during pile removal, and an oil boom will be placed within the containment boom;
- Barges or other vessels will not ground on the foreshore or river/seabed or otherwise disturb the foreshore or river/seabed (including disturbance as a result of vessel propeller wash);
- No equipment will operate on the intertidal foreshore; and
- A marine based large spill clean-up kit including sufficient booms to contain a major spill will be on site during all marine operations.
- Discuss marine mammal issues that are identified during construction, with the Environmental Inspector, the Marine Resource Specialist and the appropriate regulatory authorities.
- Implement marine mammal-specific mitigation measures outlined under relevant activities (e.g., impact pile installation above).
- Implement the Onshore or Marine Wildlife Species of Concern and Discovery Contingency Plan (see Appendix B of the EPP, which now also applies to marine wildlife species), in the event of encountering a marine mammal species of concern.

Monitoring reports for in-water activities will be provided by the monitor to Environmental Manager and forwarded onto the VFPA on a monthly basis unless noted otherwise in the Marine Mammal Monitoring Plan.

5.11 Heritage Resources

The 2115 Commissioner Street sites have been subject to an archaeological overview assessment (AOA). Results of the AOA concluded that there is no need for further archaeological surveys at these sites. Provincial Heritage Register indicates there are no known archaeological sites within the proposed boundaries of the temporary construction lands and infrastructure sites.

A desktop review of archaeological potential has been conducted to evaluate the archaeological potential of the proposed site and to provide recommendations regarding the appropriate scope of further archaeological work.

The desktop review concluded that as the site is entirely on a man-made landform, it has low potential for unrecorded archaeological sites and no further work is recommended.

The general strategy for managing potential discovery of Heritage Resources includes:

- Pre-construction desktop review of archaeological potential;
- Targeted delivery of training in archaeological material recognition; and
- Implementation of a Heritage Resources Discovery Contingency Plan to manage possible chance finds.

5.11.1 Archaeological Training

Archaeological education and awareness includes training in how to recognize cultural materials (e.g., artifacts, burial sites) and how to implement the Heritage Resources Discovery Contingency Plan that has been developed to manage possible encounters with archaeological materials during construction. The protocol includes procedures for stopping work and notifying supervisory personnel in the event suspicious materials are encountered.

. Basic training on Project obligations respecting archaeological management will be delivered to all construction personnel as part of the basic site orientation. The basic training will be designed to deliver awareness that Heritage Resources are protected under provincial legislation (*Heritage Conservation Act*) and these may be encountered during construction.

Specialized training is not applicable for the 2115 Commissioner St. Stockpile Site (Versacold Site) as the development footprint has been assessed as having low potential. However, personnel will be reminded of the following:

- Archaeological chance finds can occur anywhere there is ground disturbance
- All archaeological sites, regardless of their state, are automatically protected by the *Heritage Conservation Act* (HCA) and it is unlawful to alter or remove objects from a site without an appropriate HCA permit.
- In the event of a chance find work is to stop and the Heritage Resources Discovery Contingency Plan is to be implemented

5.11.2 Heritage Resources Discovery Contingency Plan

The following procedure will be implemented to manage possible encounters with previously unknown or undisclosed Heritage Resources (also commonly referred to as a change find procedure).

In the event that suspected heritage resource sites are discovered during construction, implement the measures listed below.

- Prohibit the collection of any historical, archaeological or paleontological resources by Project personnel except for qualified Heritage Resource Specialists acting as authorized by the appropriate regulator/permit.
- Suspend work immediately in the vicinity (i.e., within 30 m) of any newly identified archaeological, paleontological or historical resource sites (e.g., modified bone, pottery fragments and fossils). Work at that location may not resume until the measures below are implemented. Clearly mark the site using fencing and flagging to secure avoidance where appropriate.
- Notify the Environmental Coordinator, who will notify the Construction Manager, the Contractor Environmental Manager, the Heritage Resource Specialist and, if warranted, the local police and appropriate government authority.
- As and where required, a qualified Heritage Resource Specialist (either an archaeologist or a paleontologist) will develop, if warranted, an appropriate mitigation plan in consultation with the Contractor, Environmental Inspector, the Construction Manager, the appropriate government authority, as well as the applicable Aboriginal communities. The mitigation measure options available include those measures for site avoidance, systematic data recovery and monitoring/surveillance as described above.

5.11.2.1 Human Remains Discovered During Construction

In the event that suspected human remains are discovered during construction, implement the mitigation measures listed below.

- Suspend work immediately in the vicinity of the newly identified human remains. Work at that location may not resume until the measures below have been implemented.
- Notify the Environmental Coordinator, who will notify the Construction Manager, the Contractor Environmental Manager, the Heritage Resource Specialist and, if warranted, the local police and appropriate government authority.
- If human remains are determined to be archaeological, the Heritage Resource Specialist will contact and collaborate with local First Nations regarding the treatment and management of the remains
- If there is potential for disturbance to the site due to trafficability or high public visibility, assign employees to stand watch until the local police and Heritage Resource Specialist arrives.
- Stake or flag off the location to secure avoidance.

- Cover any exposed remains with clean plastic sheeting, tarpaulin, blanket or other covering until the local police and Heritage Resource Specialist is present.
- Do not backfill. If excavated fill has been loaded into a truck, empty the excavated fill at a nearby secure location for the local police and Heritage Resource Specialist to inspect.
- Work will only resume in that area once the archaeological and forensic studies are complete, clearance has been granted by the local police and appropriate government authority, and direction has been advised that work can continue.

5.12 Sensitive Habitat Features and Species

5.12.1 Species at Risk

The aquatic biophysical survey report indicated that site conditions within the assessment area are not considered conducive to the presence of federally or provincially listed species at risk. The only listed resident species with the potential to occur at the Project location is northern abalone.

Northern abalone (provincially Red-listed; designated Threatened by COSEWIC, 2000; designated Threatened under the *Species at Risk Act* [SARA] Schedule 1, 2003) occurs in rocky habitats from the low intertidal to 100 m below sea level but is usually found in water less than 10 m deep. In BC, northern abalone distribution is patchy and typically located along open coastline. This species was not detected during either survey. The probability of this species occurring at the Project location is considered low due to the protected nature of the area under the wharf.

SARA listed marine mammals that are occasionally sighted in Burrard Inlet include Stellar sea lion (*Eumetopias jubatus monteriensis*), harbor porpoise (*Phocoena phocoena*) and southern resident and transient killer whale (*Orcinus orca*).

5.12.2 Mitigation Measures

Burrard Inlet is considered sensitive habitat features that has the potential to be impacted during construction. Mitigation measures related to the protection of riparian habitat, terrestrial habitat and the prevention of off-site migration of sediment laden run-off to these features with provided the Vegetation and Wildlife Management and Erosion and Sediment Control the sections in this CEMP (Sections 5.8 and 5.6, respectively). The following mitigation measures will also be employed:

- Verify that mitigation measures associated with onshore and marine wildlife species at risk are communicated to Project personnel.
- Report sightings of sensitive species or species at risk immediately to the Environmental Inspector. Implement the Wildlife Species of Concern and Discovery Contingency Plan, as appropriate. The Environmental Inspector will record the location in the daily reports.
- Discuss marine fish and fish habitat issues that are identified during construction with the Environmental Inspector, the Marine Resource Specialist and the appropriate regulatory authorities.
- Barges will be anchored or spudded in appropriate areas where potential for effects to intertidal and subtidal marine habitats is limited. Grounding is prohibited, unless authorized by VFPA. Avoid sensitive marine habitats, where feasible.

Have the Environmental Inspector report immediately to DFO if the extent or nature of permanent alteration or destruction of fish habitat during any marine construction phase is outside of the scope defined in permits and approvals or if there is an occurrence of unpermitted serious harm to fish, or an increase in the risk of serious harm to fish.

6 EMERGENCY RESPONSE

The Marine Spill Contingency Plan has been prepared for construction activities being completed at the 2115 Commissioner Street Sites. This plan demonstrates that KLTP has appropriate response capabilities and measures in place to effectively address potential releases during construction at the 2115 Commissioner Street Sites.

6.1 Purpose and Scope

Spill reporting procedures are applicable to all Trans Mountain construction activities. These procedures are specific to the 2115 Commissioner Street Sites and will be followed in the event of a spill or release, within this facility or contamination of coastal waters during construction activities associated with the Project.

The purpose of this plan is to provide direction on how to quickly, safely and effectively respond to a construction phase marine spill at the 2115 Commissioner Street Sites to allow for the protection of the public, employees and Contractors, the environment and company property. In addition, this plan will facilitate the reporting of releases of hazardous materials to the appropriate authority, as required. As a federally regulated company, Trans Mountain is responsible for reporting any volume of spill at the 2115 Commissioner Street Sites to the NEB. This Marine Spill Contingency Plan identifies the lines of authority and responsibility, establishes proper reporting and communication procedures and outlines an action plan, to be implemented in the event of a marine spill. This Marine Spill Contingency Plan applies to fuel, hydrocarbons, chemicals and other potentially harmful substance released at the 2115 Commissioner Street sites.

Construction-specific activities may result in spills, such as:

- spills from on-land construction vehicles/equipment that drain into the ocean;
- spills from vessels engaged in construction activities (e.g., tugs and workboats); and
- spills from construction equipment on barges (e.g., pile drivers).

6.2 Response Organization

Spills into or threatening a body of water are considered reportable through the Emergency Response Line process, as a reportable incident, to the Senior Compliance Advisor. The Senior Compliance Advisor must report any incident of a spill or release at the 2115 Commissioner Street Sites directly to the NEB, as soon as practical, and take appropriate measures to remediate the contamination. The NEB also requires notification of the contamination, in writing, to the Secretary of the Board (NEB 2011).

Emergency spill response equipment will be located, as a responsibility of the contractor, in the TMEP 2115 Commissioner Street Sites Oil Spill Containment and Recovery location. The location and contents of the emergency spill response equipment will be discussed intermittently during daily safety meetings. Further information regarding this equipment can be obtained from the Contractor.

Prompt notification of a spill to the 2115 Commissioner Street Sites Supervisor is crucial. Contact local emergency response providers in the event of a spill involving danger to human life. For marine pollutant or spills in Vancouver harbour, call Vancouver Traffic VHF 12/11/74/16 immediately.

For a spill to the marine environment, immediate notification to Canadian Coast Guard Marine Communications and Traffic Services (MCTS) is required (see <http://www.ccg-gcc.gc.ca/e0003876>). All accidental over side discharges should be reported immediately to the Operations Centre (1-604-6659086).

If the discharges contain oil or other deleterious substances, the vessel must immediately notify the MCTS and activate its pollution response plan. The Port Information Guide (VFPA 2016) provides more information and clarification regarding reporting requirements (see <http://www.portvancouver.com/wp-content/uploads/2015/03/Port-Information-Guide-12-Port-of-Vancouver-August-2016-amended.pdf>).

6.3 Contractor Responsibilities

KLTP will be responsible for prevention, preparedness, response and reporting on their work sites during the construction phase of the Project. KLTP will maintain an up-to-date inventory and location knowledge of response materials at the worksite. KLTP will provide training, prior to work, and implement regular emergency response exercises to enable workers and subcontractors to perform their designated emergency responsibilities. It will be KLTP's responsibility to immediately inform the Site Supervisor, Contractor Environmental Manager, VFPA Environmental Lead, Environmental Inspector, TMEP management and the Senior Compliance Advisor in the event of a spill or release.

6.4 Equipment

Emergency response equipment and materials will be stored on-site, as close to the area of work as feasible. These materials will include, but are not be limited to: booms; skimmers and other collection devices; sea-water pumps; hoses; sorbents; fire nozzles; containment vessels; spill kits; and personal protective equipment. Any concerns regarding additional response equipment should be directed to the 2115 Commissioner Street Sites Supervisor, who will be able to source supplementary equipment through local service providers in the area.

6.5 Initial Assessment

In the event of any incident, the location and circumstances will be assessed to determine the safety hazards, human and environmental resources at risk of adverse effect and potential of the incident escalating into a greater incident. This assessment will be conducted by the Environmental Inspector or the Site Supervisor, depending on the circumstances. The priorities of the Environmental Inspector in the event of a release incident are to:

- protect people and environment;

- stop the source, if safe to do so; and
- contain the release.

6.6 Recovery

After the initial assessment is complete, recovery of free product or materials with high concentrations of spilled product should be performed as soon as feasible to reduce the extent of effects to the shoreline, sediment and water.

6.7 Detailed Assessment

After the initial assessment and recovery activities are complete, a detailed assessment of effects resulting from the spill is required. This assessment will: investigate the effects to the shoreline, sediment, water and wildlife in detail; provide comparisons of concentrations of parameters of concern with applicable guideline concentrations; and provide recommendations for remedial activities, if warranted.

6.8 Remediation

Remedial activities recommended in the detailed assessment should be implemented as soon as feasible following the spill to bring sediment and water conditions into compliance with regulations. Long-term monitoring may be required as a result of certain spills. A remediation report is required to be submitted to the appropriate bodies.

6.9 Closure

Once the site has been brought back into compliance with applicable regulations and monitoring activities are complete, a closure report is required to be submitted to the appropriate bodies.

6.10 Emergency Communication

Emergency communication is outlined in the Project Communication Plan. It is important to note that quick and clear communication is essential to minimize potential impacts to workers, the public, property and the environment in emergency situations. The VFPA will be contacted for any release of a dangerous goods (as defined in the BC Spill Reporting Regulation) to water or any amount to land that is over the volume for the listed in the Schedule of the BC Spill Reporting Regulations. In addition, the Canadian Coast Guard will be contacted for any spill of hazardous material to Burrard Inlet. The phone numbers of key emergency responders are provided in Table 3.

Table 3: Key Emergency Contact Phone Numbers

Authority/Company Name	Phone Number
Emergency Services	911
VFPA Operations Centre	604-665-9086
Local Non-emergency police	604-985-1311

Local Non-emergency fire	604-980-5021
Vancouver General Hospital	604-875-4111
Emergency Management BC (formerly PEP)	1-800-663-3456
DFO Radio Room	604-666-3500
Canadian Coast Guard	604-775-8881
Tri-Arrow Industrial Recovery Inc. (3 rd party spill response)	604-682-2751
HazCo Emergency Response (3 rd party spill response)	1-800-667-0444
Safety-Kleen Emergency Response (3 rd party spill response)	1-888-375-5336

7 FUEL MANAGEMENT PLAN

7.1 Refueling Procedures

The following best management practices will be following for all refueling operations. All construction personnel involved with refueling will undergo specific training on these practices.

7.1.1 Onshore Works

General measures include:

- Deliver fuel to construction site by approved mobile refueling tanks (either to on-site refueling tanks or directly into the equipment);
- All dispensing or transferring of fuel will be attended for the duration of the operation;
- The attendant will be trained in fueling procedure;
- Refuel excavators and other large tank capacity machines away from a water body and other ESAs (minimum 100 m unless otherwise reviewed and accepted by the Environmental Inspector);
- When transferring fuel from mobile tank to large machines, place sorbent material around the fuel inlet prior to dispensing, and use pumping equipment, an approved hose and top-fill nozzle;
- Verify that there is a proper connection between the fuel fill hose and the fill pipe of the tank, mobile refueling tank or the equipment being filled, and verify that the fill valve is open;
- Do not overflow the receiving tank;
- While refueling, suspend operation of moving equipment in the immediate vicinity of the refueling; and,
- Maintain regular inspections of fuel systems and their components (check for leakage, deterioration or damage).

7.1.2 Refueling Marine Equipment

- Refueling procedures specific to marine based equipment used for construction of the piles and wharf structure will be developed and provided by the marine subcontractor(s) as part of marine Work Methods.

7.1.3 Jerricans

- Smaller equipment can be refueled using CSA approved jerrican(s); and,
- When not in use, jerricans should be placed in portable secondary containment rather than placed directly on the ground;

8 WASTE MANAGEMENT PLAN

The Plan has been prepared to provide guidelines for dealing with the generation of Project waste, and to provide guidelines for dealing with the procurement, storing and handling of hazardous materials and chemicals required for the Project.

This Plan outlines specific measures to be followed by all employees and contractors involved with the construction of the Project. The Plan is designed to ensure that chemicals and wastes are procured, handled, stored and disposed of in an environmentally responsible manner, thereby maintaining ecological and cultural integrity. This Plan will reduce the likelihood of an accidental release of potentially hazardous waste products into the environment during construction.

This Plan applies to all employees, contractors and consultants who conduct work on during construction of the Project. All employees, contractors and consultants will abide by all federal, provincial and local requirements for the storage, handling, transport, disposal and release reporting requirements of all products and waste materials that are potentially hazardous to human health and the environment.

The Contractor Environmental Manager Environmental Inspector are responsible for ensuring compliance with Trans Mountain's Environmental Guidelines and all applicable codes, regulations and industry standards for waste management and handling chemicals. Where a discrepancy occurs, the most stringent requirements apply. In the event of a release (i.e., spill), the Spill Contingency Plan (see Appendix B of the Pipeline EPP) will be implemented. The Spill Contingency Plan sets forth the lines of communication and procedures to follow in order to facilitate containment and clean-up should a release occur.

8.1 Guiding Principles

KLTP and Trans Mountain are committed to performing its activities in an environmentally responsible manner. The following general guiding principles have been incorporated into this plan:

- reasonable preventative measures will be taken to avoid the release of wastes and hazardous materials into the environment;
- all waste and hazardous material releases must be reported to the Environmental Inspector, and to the appropriate authorities, if warranted;
- all waste and hazardous material releases will be cleaned up promptly and thoroughly; and
- waste and hazardous materials will, to the extent feasible, be recycled, disposed of or moved to an approved area as required.

8.2 WASTE CHARACTERIZATION

The starting point for effective waste management begins with accurate waste classification. Potential project related wastes have been divided into two categories, namely hazardous waste and non-hazardous waste, for discussion of storage, handling and disposal procedures. Waste characterization should follow the proper guidelines (e.g. BC Hazardous Waste Legislation Guide) and ensure compliance with proper transportation and disposal procedures.

Nonhazardous Wastes – include garbage and debris generated through the activities of personnel during construction and construction footprint reclamation that are nontoxic in nature and can be disposed in approved industrial landfills or solid waste landfills (non-secure landfills in BC). These include, but are not necessarily limited to:

- food wastes on footprint, office areas and camps;
- camp black and grey water;
- recyclable materials (e.g., paper, tin);
- pipe tape and coating;
- spent welding rods;
- pipe end shavings;
- grinder pads;
- styrofoam and plastics;
- wood (e.g., skids, survey stakes);
- wire;
- cut and collected invasive plants;
- flagging tape;
- used geotextile;
- construction and demolition debris;
- contaminated soil (below the acceptable limit); and
- metal strapping.

Hazardous Wastes – wastes with any of the properties described in Schedule 1 but does not include those wastes defined in the BC *Hazardous Waste Regulation*. Generally speaking, hazardous waste include wastes and products generated or used during construction that may contain toxic substances in the form of residues. These wastes have to be disposed in approved secure landfills in BC. These include, but are not necessarily limited to:

- used lube filters;
- spent grease cartridges;
- Naturally Occurring Radioactive Materials (NORMs) (e.g., radon);
- spent cleaning products and associated materials (e.g., rags);
- used batteries (i.e., automotive or equipment);
- de-icers;
- fuels (gasoline, diesel, propane);
- used oils and lubricants (e.g., engine oil, transmission/drive train oil, hydraulic oil, gear oil, lubricating grease);
- used antifreeze/coolants (i.e., containers/cans of ethylene glycol, propylene glycol);
- paints and solvents, brushes with residues of these materials; and,
- glues (including epoxy and urethane coating products) and cements

8.3 PREVENTION AND MITIGATIVE MEASURES

All employees, contractors and consultants of Trans Mountain will be required to comply with applicable regulations for the containment, handling, storage, use and disposal of wastes and chemicals.

For the Versacold site, hazardous waste storage

8.3.1 General Requirements

Following are some of the guidelines for hazardous waste storage (Hazardous Waste Storage Guidelines, AEP 1988; Hazardous Waste Legislation Guide, BCMOE 2016)

1. Siting requirements for construction yards and staging areas that are designated as hazardous waste storage areas:
 - The facility shall be readily accessible for fire-fighting and other emergency procedures.
 - The location is not subject to flooding caused by a 24 hour, 10 year storm.
 - The location shall be chosen to minimize the potential for environmental damage, including any threats to the quality of surface water and groundwater, and to the health of humans, animals and plants from the normal operation of the facility and from any other causes.
2. Safety requirements for hazardous wastes storage areas
 - A storage facility for hazard waste shall be designed, constructed and operated such that it complies with the requirements stipulated in the provincial occupational health and safety (OHS) legislation and the *Canada Labour Code*.
 - A storage facility for hazardous waste shall comply with the requirement for safety equipment stipulated by the regulations (e.g. Alberta Fire Code under the *Fire Prevention Act*).
 - Access to a hazardous waste storage facility shall be limited to employees who have been trained in respect of normal and emergency procedure.
 - A storage facility shall have signage indicating that hazardous wastes are stored therein.
 - Incompatible waste must be stored in such a manner that contact in the event of an accidental release is not possible.
3. Operational requirements for hazardous wastes storage areas:
 - Secondary containment must meet regulatory requirements
 - Ventilation rate must meet regulatory requirements
4. The KLTP will register with the appropriate provincial government department with respect to hazardous materials (to obtain a hazardous waste generator number or equivalent) and shall, at that time, provide detailed manifest information regarding the location of the staging areas, the types of waste that will be produced, and the transport vehicles that will be collecting the waste for disposal.

8.3.2 Training

1. All Project staff with waste management and hazardous materials responsibilities will be educated in accordance with regulatory requirements specific to the Project. All personnel shall understand their responsibilities for proper handling, identification, documentation and storage of wastes and hazardous materials.
2. All Project staff will possess valid WHMIS training [Section 7.0 General Pipeline Construction Mitigation Measures].
3. All fuel truck drivers, and drivers transporting waste or chemicals will have current Transportation of Dangerous Goods (TDG) certification.

8.3.3 Non-Hazardous Wastes

1. An appropriate number and gender of portable toilets shall be made available to ensure each crew has ready access to washroom facilities. The number of toilet facilities will meet regulatory requirements. Generally speaking, the number of toilets is depending on the number of employee for that sex. The facilities will be serviced and cleaned regularly and will be adequately secured. All site personnel are to use portable toilets as provided. Sewage and greywater will be hauled to approved facilities for disposal [Section 7.0 General Pipeline Construction Mitigation Measures].
2. An appropriate number of waste and recycling receptacles will be made available during construction. Each construction site will be equipped with adequate garbage receptacles for solid non-hazardous wastes and debris. All garbage and food waste will be regularly transported to the nearest bear-proof transfer station or landfill for proper disposal.
3. Secured non-hazardous materials (e.g., skids, geotextiles, survey stakes) that pose no threat to the surrounding ecosystem will be neatly stockpiled in locations along the right-of-way for disposal. The disposal frequency is dependent upon the type of material stockpiled and the plan for storage will be approved by the Waste Management Coordinator.
4. All garbage will be stored in wildlife-proof containers when potential wildlife/human conflicts may occur [Section 7.0 General Pipeline Construction Mitigation Measures].

8.3.4 Hazardous Waste and Chemical Handling

1. During waste and chemical handling activities, employees and/or contractors will use appropriate personal protective equipment to prevent any contact with material.
2. Procedures for safe loading and unloading of products will be followed:
 - service vehicles will be equipped with automatic shut-off valves;
 - brakes will be set;
 - the vehicle will be grounded if the product is flammable;
 - the operator will observe loading and unloading activities at all times; and
 - when complete, the operator will examine all outlets for leakage and take corrective action if warranted.
3. Material Safety Data Sheets (MSDS) will be kept onsite for all chemicals handled.

8.3.5 Hazardous Waste and Chemical Storage

1. Designated hazardous waste storage areas at a facility shall be designed to meet all applicable federal and provincial regulations.
2. Hazardous materials will be stored in designated storage area(s). Short-term hazardous material storage on the pipeline construction footprint may be designated with approval of the Environmental Inspector, if required for specific tasks.
3. Hazardous materials wastes will be stored greater than 100 m from a waterbody, wherefeasible.
4. Designated storage areas will be clearly identified and secured. Waste stored in any containers must be clearly labelled to comply with the TDG Act and WHMIS regulations.
5. Hazardous wastes will be separated by type.
6. Secondary containment may be required depending on the location, type, volume and duration of the waste or chemical being stored. Secondary containment will be in accordance with applicable federal, provincial and municipal requirements.

7. Containment devices will be constructed from suitable metallic or non-metallic materials capable of containing the stored product. Liners used for secondary containment shall be placed and maintained to ensure their effectiveness and intended use.
8. Secondary containment areas not protected from the elements will be monitored regularly to ensure that ice, snow, or rainwater have not decreased the volumetric capacity for storage of a release to be less than 110% of the aggregate storage volume of the containment area. Water accumulated within a secondary containment structure may be removed if authorized by the Environmental Inspector. If there is visible hydrocarbon sheen, the water will be collected for proper storage and disposal.
9. Containers and tanks will be closed when not in use. Drain valves will be locked to prevent accidental or unauthorized releases.
10. Visually inspect fuel tanks on a regular basis as well as when the tank is refilled. Maintain inspection records for each tank, where warranted. Take remedial action as soon as a crack, dent or leak is detected [Section 7.0 General Pipeline Construction Mitigation Measures]
11. The Contractor will remove all secondary containment structures at the end of the construction phase, and return the impoundment area to its original contours and appearance, including establishing appropriate drainage patterns and vegetation cover.

8.3.6 Waste Disposal

1. All waste materials will be disposed of in accordance with federal and provincial legislation and municipal/regional regulations as required.
2. The Contractor will plan for disposal and will obtain approval and liaise with the Waste Management Coordinator for use of pre-approved waste facilities and to determine options for Project-related waste disposal.
3. Waste disposal facilities are audited on a regular basis to ensure environmental, regulatory, and financial compliance. Only approved facilities are permitted to accept waste. Solid non-hazardous wastes and debris will be collected as required and disposed of at approved locations.
4. Used oil and oil filters will be placed in sealed containers and delivered for disposal by a qualified service contractor.
5. Receptacles for recycling various products (e.g., paper and tin) will be available at Project construction yards and camps and will be hauled to appropriate recycling depots.
6. NORMs will be transferred to approved locations by a qualified contractor for final disposal.
7. Facilities for disposal or treatment of PCB must be pre-approved by Trans Mountain. This includes third party waste brokers, consultants and contractors. PCB concentration must be thoroughly characterized prior to special treatment or disposal.

8.3.7 Documentation and Record Keeping

1. MSDSs will be available for each product stored at a particular construction yard or staging area. Copies will be provided to the Lead Environmental Inspector and Waste Management Coordinator.
2. The Contractor will maintain a record of the routine inspections performed on the industrial waste storage area(s). The Contractor will provide these records for the construction office with any and all inspection reports monthly and will forward these to the Waste Management Coordinator.

3. Provincial manifest will be reviewed by an authorized Trans Mountain representative with current TDG certification when waste is transferred from a temporary storage facility for transport to a final disposal location. In Alberta, the generator must complete Part A, the carrier complete Part B, and the receiver complete Part C of the manifest.
4. The Waste Management Coordinator will be provided with copies of waste manifests. Provincial manifest records must be reconciled within six weeks of initial shipment date. Until notification that the waste has been received at its final disposal location, the waste is the responsibility of Trans Mountain.
5. Copies of manifest records must be kept in a central location for a minimum of two years after the waste has arrived at its final disposal location.

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H-1 APPENDIX A
EMERGENCY CONTACTS

H-1 APPENDIX B
CONTINGENCY PLANS

H-1 APPENDIX C
MARINE CONTINGENCY PLANS