



**ENVIRONMENTAL PROTECTION PLANS
VOLUME 4
WESTRIDGE MARINE TERMINAL
ENVIRONMENTAL PROTECTION PLAN
FOR THE
TRANS MOUNTAIN PIPELINE ULC
TRANS MOUNTAIN EXPANSION PROJECT
NEB CONDITION 81**

**July 2018
REV 6
687945**

01-13283-TW-WT00-EV-PLN-0001

Prepared for:



TRANSMOUNTAIN

Trans Mountain Pipeline ULC

Kinder Morgan Canada Inc.
Suite 2700, 300 – 5th Avenue S.W.
Calgary, Alberta T2P 5J2
Ph: 403-514-6400

TABLE OF CONCORDANCE

National Energy Board (NEB) Condition 81 is applicable to the OC-064 (CPCN) legal instrument. Table 1 describes how this Westridge Marine Terminal EPP addresses the Condition requirements applicable to Project activities.

TABLE 1

LEGAL INSTRUMENT CONCORDANCE WITH NEB CONDITION 81

NEB Condition 81	OC-064 (CPCN)
<p>The updated EPP must be a comprehensive compilation of all environmental protection procedures, mitigation measures, and monitoring commitments, as set out in Trans Mountain's Project application, its subsequent filings, or as otherwise committed to during the OH-001-2014 proceeding. The updated plan must describe the criteria for implementing all procedures and measures using clear and unambiguous language that confirms Trans Mountain's intention to implement all of its commitments. The updated EPP must include the following:</p> <p>a) environmental procedures (including site-specific plans), criteria for implementing these procedures, mitigation measures and monitoring applicable to all Project phases and activities;</p>	<p>Environmental procedures, criteria for implementing these procedures, mitigation measures, and monitoring applicable to all Project phases and activities are described throughout this EPP.</p> <p>Site-specific plans are provided in Appendix D of this EPP.</p>
<p>b) policies and procedures for environmental training and the reporting structure for environmental management during construction, including the qualifications, roles, responsibilities, and decision-making authority for each job title identified in the updated EPP;</p>	<p>Section 4.0 of this EPP and the Compliance Management Plan (Volume 10 of the Environmental Plans).</p>
<p>c) any additional measures arising from supplemental pre-construction studies and surveys;</p>	<p>Resource-Specific Mitigation Table (Appendix D of this EPP).</p>
<p>d) updated contingency plans and management plans;</p>	<p>Updated contingency plans are provided in Appendix B of this EPP.</p> <p>Updated management plans are provided in the accompanying Volume 6 of the Environmental Plans.</p>
<p>e) updated facility drawings, including relevant site-specific resources and mitigations;</p>	<p>Appendix E of this EPP.</p>
<p>f) a description of how Trans Mountain has taken available and applicable Aboriginal TLU and TEK into consideration in developing the plan, including demonstration that those Aboriginal persons and groups who provided Aboriginal TLU information and TEK, as reported during the OH-001-2014 proceeding and/or pursuant to Condition 97, had the opportunity to review and comment on the information; and</p>	<p>Section 1.2 and Appendix F of this EPP.</p>
<p>g) a summary of its consultations with Appropriate Government authorities and any potentially affected Aboriginal groups. In its summary, Trans Mountain must provide a description and justification for how Trans Mountain has incorporated the results of its consultation, including any recommendations from those consulted, into the plan.</p>	<p>Appendix F of this EPP.</p>

ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Full Name
the Application	Facilities Application
ATK	Aboriginal Traditional Knowledge
BC	British Columbia
BC MFLNRO	British Columbia Ministry of Forests, Lands and Natural Resource Operations
BC MOE	British Columbia Ministry of Environment
BC OGC	British Columbia Oil and Gas Commission
CMP	Compliance Management Plan
CRA	commercial, recreational and Aboriginal
CSA	Canadian Standards Association
dB	Decibel
DFO	Fisheries and Oceans Canada
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESA	Environmental and Socio-Economic Assessment
ESC	Erosion and Sediment Control Plan
GIS	Geographical Information System
GPS	global positioning system
ISLMS	Integrated Safety and Loss Management System
km	Kilometre
KEEP	Knowledge and Experience Enhancement Program
KMC	Kinder Morgan Canada Inc.
MOC	Management of Change
m	Metre
NEB	National Energy Board
<i>NEB OPR</i>	<i>National Energy Board Onshore Pipeline Regulations</i>
RCT	Regulatory and Compliance Team
<i>SARA</i>	<i>Species at Risk Act</i>
TEK	Traditional Ecological Knowledge
the Project	Trans Mountain Expansion Project
the Program	Environmental and Compliance Education Program
TLU	Traditional Land Use
TMEP	Trans Mountain Expansion Project
Trans Mountain	Trans Mountain Pipeline ULC
TSS	total suspended solids
VFPA	Vancouver Fraser Port Authority
WHMIS	Workplace Hazardous Materials Information System
WMT	Westridge Marine Terminal
WQM	water quality monitoring

GLOSSARY

Term	Definition
air quality	A measure of the chemical pollutant loading in the atmosphere. As a measure or metric, it is generally related to human health endpoints, odour thresholds or environmental effects that are developed and regulated by municipal, provincial or federal government authorities. Ambient air quality objectives or standards have been developed to reflect the more stringent effect and measured or predicted levels are commonly compared to these values as a gauge of compliance as well as the degree of quality of the air.
Appropriate Government Authorities	The regulators and relevant government authorities that are to be consulted prior to and during construction regarding approvals, notifications, constraints and the direction of activities.
berthing dolphins	A group of steel piles that form a vessel berth structure.
borrow material	Imported, non-native soil, aggregate or consolidated materials that are used during construction.
construction footprint	This area comprises the permanent facility footprint and temporary workspace that is disturbed during construction.
circular sheet pile wall	Circular structures made of sheet piles placed in a vertical configuration down to the substrate and linked together to form circular cells. The ground inside the cells will have ground improvement measures implemented to meet seismic design requirements.
Contractor	The main company contracted for the construction coordination, supervision and completion of the Westridge Marine Terminal component of the Trans Mountain Expansion Project.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
development zone	The area located within the facility footprint, where facility infrastructure is located.
<i>Environment, Health and Safety Policy</i>	Kinder Morgan Canada Inc.'s <i>Environment, Health and Safety Policy</i> , which has been adopted by Trans Mountain. This is the formalization of Trans Mountain's commitment to conduct business in a safe and environmentally responsible manner.
Environmental and Compliance Education Program	An Environmental and Compliance Education Program (the Program) has been designed to ensure that all Project personnel have adequate knowledge of environmental protection and mitigation measures, as well as the Compliance Management Plan. The Program ensures that work is conducted in accordance with all applicable legal requirements, regulations, permits, approval Conditions, and all commitments made by Trans Mountain.
environmental feature	An environmental feature includes rare plants and rare ecological communities, wildlife species at risk, species of concern, wildlife habitat, archaeological features, TLU sites and any other sensitive environmental or cultural features.
feasible	Capable of being reasonably accomplished or brought about given environmental and economic considerations.
Health, Safety and Environment Policy	The formalization of Trans Mountain Pipeline ULC's commitment to conduct business in a safe and environmentally responsible manner supported through a series of commitments.
high tide	The state of the tide at its highest level.
hydrostatic testing	The use of water for hydrostatic testing facility piping in order to expose potential defects or leaks and to ensure integrity.
Kinder Morgan Canada Inc.	Kinder Morgan Canada Inc. is a corporation owned by Kinder Morgan Inc. Kinder Morgan Canada Inc. operates Trans Mountain Pipeline L.P., a general partner of Trans Mountain Pipeline ULC.
low tide	The state of the tide at its lowest level.
Lower Mainland Region	The geographic area located approximately west of Hope, British Columbia to Vancouver, British Columbia.
merchantable timber	Timber that will be salvaged and meets the minimum salvage specifications.
mitigation measures	Mean measures for the elimination, reduction or control of a project's adverse environmental effects, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.
mooring dolphins	A group of steel piles used as a point to moor vessels.
National Energy Board	An independent federal agency established in 1959 by the Parliament of Canada to regulate international and interprovincial pipelines and associated facilities.
Noxious weeds	A plant designated in accordance with the regulations as a Noxious weed, which includes the plant's seeds; a person shall control a Noxious weed that is on land in which the person owns or occupies (<i>Weed Control Act</i>).
onshore	The area of land extending back from the high tide mark.
Vancouver Fraser Port Authority	A non-shareholder, financially self-sufficient Crown corporation established by the Government of Canada in January 2008, pursuant to the <i>Canada Marine Act</i> , and accountable to the federal Minister of Transport. It is the principal authority for shipping and port-related land and sea use in the Metro Vancouver region.
practical	Capable of or suitable to being put into effect, given environmental and economic considerations.
root zone material	The upper layer of soil in non-agricultural areas.
species of concern	Refers to wildlife species that have increased potential to be affected by Project activities due to spatial or temporal overlap with the Project during sensitive life stages and therefore have identified setbacks and timing windows.
shoreline	The line along which a large body of water (e.g., ocean inlet) meets the land.
species at risk	Refers to wildlife species listed as Special Concern, Threatened or Endangered on Schedule 1 of the <i>SARA</i> and/or by the Committee on the Status of Endangered Wildlife in Canada, and Red or Blue-listed in BC or listed under the <i>BC Wildlife Act</i> . Species at risk also include vegetation as defined in the Rare Ecological Community and Rare Plant Population Management Plan (Volume 6 of the Environmental Plans) for the purpose of this EPP.
topsoil	The upper layer of soil, usually the top 10-40 cm in agricultural areas. It has the highest concentration of organic matter and micro-organisms and is distinct from subsoil usually by colour.
warranted	Justify or necessitate a course of action.

Term	Definition
Westridge Marine Terminal	Trans Mountain-owned marine loading facility located within Burrard Inlet and the Vancouver Fraser Port Authority that can accommodate ships up to 120,000 deadweight tonnes and barges. The Westridge Marine Terminal has been in operation since 1957.
Westridge Marine Terminal Environmental Facility Drawing	A map noting the locations of select environmental features that are encountered by the construction of the Westridge Marine Terminal, associated potential issues and recommended mitigation measures.

TABLE OF CONTENTS

	<u>Page</u>
ABBREVIATIONS AND ACRONYMS.....	II
GLOSSARY	III
1.0 INTRODUCTION.....	1
1.1 Purpose	4
1.2 Traditional Ecological Knowledge and Traditional Land Use	4
2.0 ENVIRONMENTAL PROTECTION PLAN ORGANIZATION	5
2.1 Organization.....	5
3.0 CONSULTATION AND ENGAGEMENT.....	7
4.0 ENVIRONMENTAL COMPLIANCE	8
4.1 Potential Permits, Approvals and Authorizations	8
5.0 NOTIFICATION OF INTERESTED PARTIES	10
6.0 GENERAL MEASURES.....	12
7.0 TERRESTRIAL CONSTRUCTION	21
7.1 General Terrestrial Measures	21
7.2 Surveying, Clearing and Access	24
7.3 Soils Handling and Grading	26
7.4 Facility Construction.....	28
8.0 MARINE CONSTRUCTION	30
9.0 CLEAN-UP AND RECLAMATION	36
10.0 WESTRIDGE MARINE TERMINAL FACILITY TESTING	38
11.0 REFERENCES.....	40
11.1 Literature Cited.....	40
11.2 GIS Data and Mapping References.....	40

LIST OF APPENDICES

Appendix A	Contacts	A-1
Appendix B	Contingency Plans	B-1
Appendix C	Drawings/Details	C-1
Appendix D	Resource-Specific Mitigation Table	D-1
Appendix E	Westridge Marine Terminal Environmental Facility Drawing	E-1
Appendix F	Consultation and Engagement.....	F-1
Appendix F-1	Record of Stakeholder Notifications of Plan	F-10
Appendix G	Aboriginal Groups Engaged on the Westridge Marine Terminal Environmental Protection Plan.....	G-1
Appendix H	Marine Water Quality Management Plan During Rip Rap Removal.....	H-1

LIST OF FIGURES

Figure 1.1-1	Project Overview Alberta and British Columbia.....	2
--------------	--	---

LIST OF TABLES

Table 1	Legal Instrument Concordance with NEB Condition 81	i
Table 1.1-1	Proposed WMT Construction Schedule	3
Table 4.1-1	Potential Federal Environmental Permits and Approvals that may be Required for Terminal Construction	9
Table 4.1-2	Potential Provincial Environmental Permits, Approvals and Authorizations	9
Table A-1	Emergency Contacts	A-2
Table D-1	Resource-Specific Mitigation Measures for Environmental Features Encountered Within the WMT	D-2
Table F-1	New Interests, Issues, Concerns and Common Trans Mountain Responses	F-3
Table F-2	Summary of Aboriginal Concerns Regarding the WMT EPP	F-8
Table F1-1	Record of Notification	F-10

LIST OF DRAWINGS

Drawing 1	Sediment Fence	C-2
Drawing 2	Turbidity Curtain Installation (Tidal Conditions)	C-3
Drawing 3	Air/Bubble Curtain Installation (Pile Installation)	C-5

1.0 INTRODUCTION

Trans Mountain Pipeline ULC (Trans Mountain) submitted a Facilities Application (the Application) to the National Energy Board (NEB) in December 2013 for the Trans Mountain Expansion Project (the Project or TMEP). The Application included a draft Environmental Protection Plan (EPP) to address Project activities at the Westridge Marine Terminal (WMT), which includes terrestrial and marine infrastructure and staging areas. This updated WMT EPP (Volume 4 of the Environmental Plans) was prepared to address the requirements of NEB Condition 81. A draft of the updated WMT EPP was submitted to Appropriate Government Authorities and potentially affected Aboriginal groups on November 17, 2016 for review. Feedback was requested by February 24, 2017. Trans Mountain incorporated any feedback into the final WMT EPP or has provided rationale for why input has not been included, as summarized in Appendix F.

The WMT EPP (Volume 4 of the Environmental Plans) is applicable to the new dock complex, as well as a utility dock at WMT, as described above, as well as land-based work at WMT. Tunneling between Burnaby Terminal and the WMT will take place and is covered under the Burnaby Mountain Tunnel EPP (Volume 9 of the Environmental Plans). The WMT EPP is based on:

- Kinder Morgan Canada Inc.'s (KMC's) Integrated Safety and Loss Management System (ISLMS) as required by the *National Energy Board Onshore Pipeline Regulations (NEB OPR)*;
- Volumes 5A and 5B of the Environmental and Socio-Economic Assessment (ESA) filed for the Project;
- results of the biophysical and engineering field programs completed to date;
- feedback obtained through engagement;
- Traditional Ecological Knowledge (TEK)/Traditional Land Use (TLU) information;
- Trans Mountain's commitments made in the ESA, to Appropriate Government Authorities and to the public;
- industry standard and best management documents; and
- professional experience based upon over 30 years of pipeline and facility planning in Western Canada.

Construction at the WMT will occur over at least 2 years during both summer and winter seasons. A summary of the WMT construction schedule is provided in EB Condition . Figure 1.1-1 illustrates the regional location of the WMT.

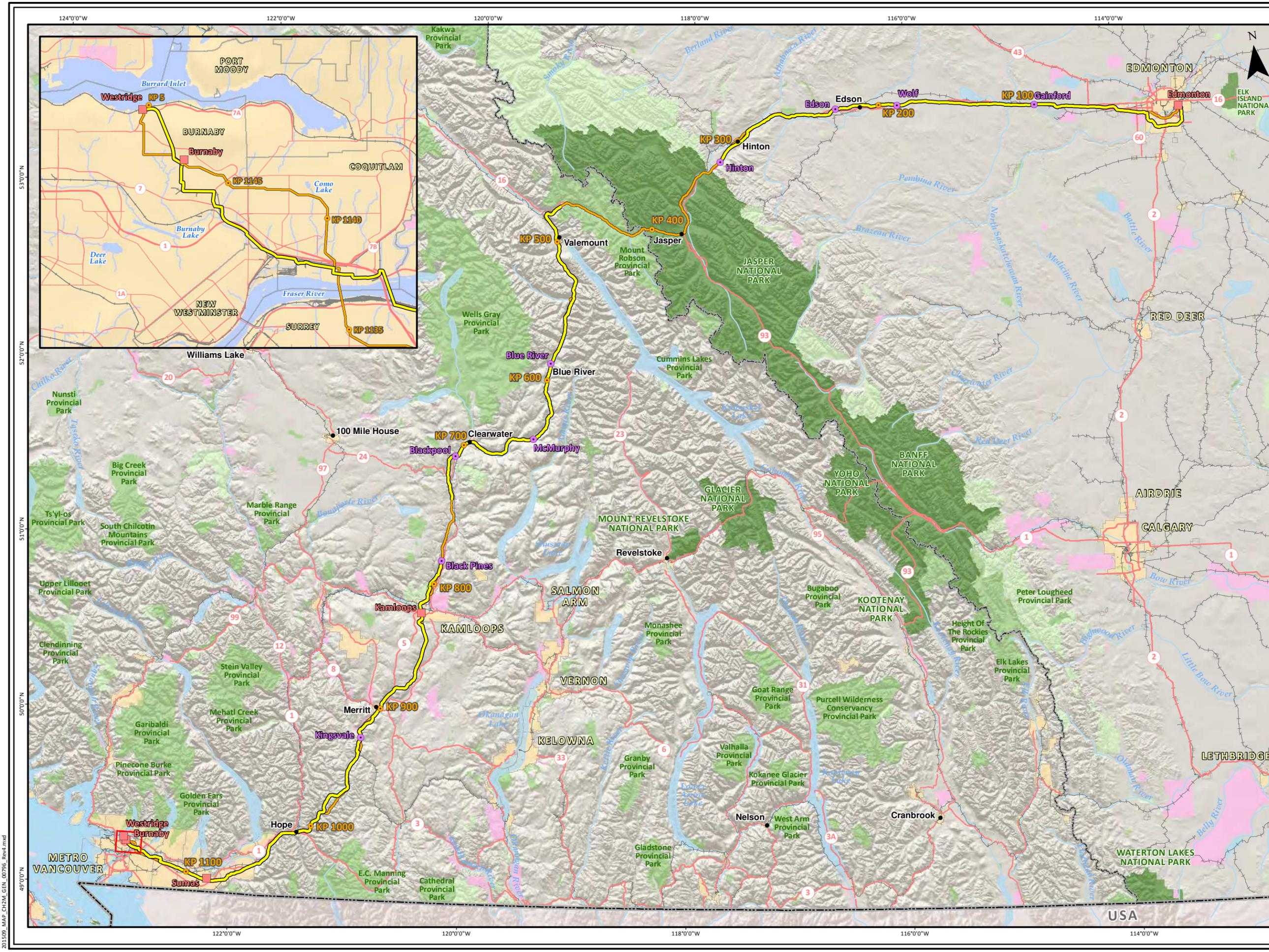


FIGURE 1.1-1
PROJECT OVERVIEW
ALBERTA AND BRITISH COLUMBIA
TRANS MOUNTAIN
EXPANSION PROJECT

- TMPL Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline (TMEP)
- Existing Pump Station
- Terminal
- Highway
- Railway
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Provincial Boundary
- International Boundary

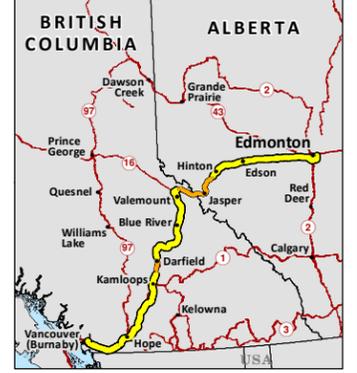
Projection: Modified UTM
 Proposed Centreline SSE10005, provided by UPI Jan 10, 2017; Baseline TMPL Route Revision 0, provided by KMC, May 2012; Facilities provided by KMC December 2016; Transportation: NRCAN 2015, BC MFLNRO 2012 & NRCAN 2012; Geopolitical Boundaries: NRCAN 2003, AltaLIS 2016, BC MFLNRO 2007 & ESRI, 2005; First Nation Lands: Government of Canada 2016, AltaLIS 2010; Hydrology: NRCAN 2010, IHS Inc. 2004 & BC MFLNRO 2008; Parks and Protected Areas: NRCAN 2016, AltaLIS 2012, ATRP 2012 & BC MFLNRO 2008; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade Copyright © 2014 Esri.

This document is provided by Kinder Morgan Canada Inc. (KMC) for use by the intended recipient only. This information is confidential and proprietary to KMC and is not to be provided to any other recipient without the written consent of KMC. It is not to be used for legal, engineering or surveying purposes, nor for doing any work on or around KMC's pipelines and facilities, all of which require KMC's prior written approval.



540 12th Avenue SW, Calgary, AB, T2R 0H4

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.



MAP NUMBER 201509_MAP_CH2M_GEN_00796_REV4	PAGE SHEET 1 OF 1
DATE April 2017	CH2M REF. 687945
SCALE 1:2,250,000	REVISION 4
DRAWN CMR	PAGE SIZE 11x17
CHECKED DIN	DISCIPLINE GEN
DESIGN TGG	



ALL LOCATIONS APPROXIMATE

This page has been intentionally left blank

1.1 Purpose

The purpose of this EPP is to communicate Trans Mountain's environmental procedures and mitigation measures to construction and inspection personnel in a clear, concise format. These potential mitigation measures are to be implemented, where warranted, during construction of the WMT to mitigate, avoid or reduce potential adverse environmental effects during construction of the Project.

Specifically, the WMT EPP:

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

The current revision of the WMT EPP is an update required by NEB Condition 81. This updated WMT 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.

1.2 Traditional Ecological Knowledge and Traditional Land Use

Aboriginal Traditional Knowledge (ATK) is typically documented as a means to preserve historical and familial connections, territorial occupation, land and resource use and temporal execution strategies. ATK includes, but is not limited to, the collection of TEK during biophysical field survey participation for the Project and TLU study information from potentially affected Aboriginal groups. Preliminary background ATK data was compiled for the Application and was consulted during the development of the NEB Condition Plans, which helped determine the mitigation measures included in the WMT EPP. The following sources were used:

- publicly available ATK, TEK and TLU reports;
- open houses and community gatherings;
- meetings and conversations with Aboriginal community representatives;
- a public record of comparable past projects or previous environmental assessments;
- published reports from regulatory authorities involved in administering or regulating a specified area or resource (*e.g.*, integrated resource plans, land and resource management plans, etc.); and
- Geographical Information System (GIS) tools to determine spatial relationships of source data to the Project.

TEK was collected during biophysical field surveys conducted for the Project. Trans Mountain has reviewed information provided in TLU reports from participating Aboriginal groups and traditional knowledge. Trans Mountain will continue to take available and applicable Aboriginal TLU and TEK into consideration in developing the WMT EPP and other NEB Condition Plans. TEK and TLU information collected is provided in the relevant NEB Condition Plans. Trans Mountain has incorporated available Aboriginal TLU and TEK into this updated WMT EPP, where appropriate.

2.0 ENVIRONMENTAL PROTECTION PLAN ORGANIZATION

This section provides an overview of the organization and scope of the WMT EPP.

2.1 Organization

The WMT EPP identifies the mitigation measures that may be implemented during pre-construction, construction and post-construction activities at the WMT, as well as contingency plans to address potential effects, events or conditions that may arise during construction. Management Plans (see Volume 6 of the Environmental Plans) will describe the specific environmental management procedures that may apply to ongoing, planned events associated with construction. The WMT EPP applies to the WMT, which includes terrestrial and marine infrastructure, as well as staging areas required to support construction of the WMT.

Environmental mitigation measures are identified under the heading "Measures" by "Activity/Concern" in accordance with the progression of construction activities and are intended to be read in conjunction with the WMT Environmental Facility Drawing (see Appendix E of this EPP). The WMT Environmental Facility Drawing and the Resource-Specific Mitigation Table (see Appendix D of this EPP), identify specific locations where mitigation measures are to be implemented at the WMT.

The WMT EPP provides:

- an understanding of the general environmental and socio-economic background of the facility site;
- the extent and limitations of the WMT EPP;
- information to identify specific or unique mitigation measures to be implemented to address environmental and socio-economic issues associated with the WMT; and
- general mitigation measures or industry-accepted standards and procedures that are typically applied during marine terminal construction; these measures are generally provided in accordance with the sequence of construction of a marine terminal.

This version of the WMT EPP comprises the following sections and Appendices:

- **Section 1.0 Introduction** provides an introduction to the WMT EPP and outlines the purpose.
- **Section 2.0 EPP Organization** provides details on the layout and general scope of the WMT EPP.
- **Section 3.0 Consultation and Engagement** provides details on the program conducted for the Project in relation to the WMT EPP, pursuant to NEB Condition 81.
- **Section 4.0 Environmental Compliance** provides information regarding the tools, decision-making processes and documentation to facilitate compliance with all legislation, regulatory approvals, permits, commitments and the specific requirements set forth in the WMT EPP.
- **Section 5.0 Notification of Interested Parties** provides details regarding specific activities to be followed to ensure that all Appropriate Government Authorities, potentially affected Aboriginal groups, landowners and applicable interested parties are properly notified prior to commencing construction activities at the WMT or, as warranted, during the construction period.
- **Section 6.0 General Measures** provides an overview of the mitigation measures that may be implemented to avoid or reduce potential adverse environmental effects associated with any or all phases of general terrestrial and marine construction activities at the WMT.
- **Section 7.0 Terrestrial Construction** outlines the mitigation measures that may be implemented during construction in terrestrial environments associated with the WMT, including surveying, clearing, access, topsoil handling and grading.

- **Section 8.0 Marine Construction** outlines the mitigation measures that may be implemented to avoid or reduce potential adverse environmental effects associated with the marine component of the WMT construction activities.
- **Section 9.0 Clean-Up and Reclamation** outlines mitigation measures that may be implemented for construction clean-up and reclamation at the WMT.
- **Section 10.0 WMT Testing** outlines the mitigation measures that may be implemented during air and hydrostatic testing at the WMT.
- **Section 11.0 References** lists the sources and reference material used to create the mitigation measures and strategies provided in the WMT EPP.
- **Appendices** to the WMT EPP are as follows.
 - Appendix A of this EPP (Contacts) provides general contact information of Project representatives and Appropriate Government Authorities that are to be consulted and or contacted during construction activities at the WMT. The Prime Contractor will provide emergency contact information in the site-specific Emergency Response Plan (ERP) for WMT.
 - Appendix B of this EPP (Contingency Plans) provides contingency measures that may be implemented to mitigate potential environmental effects that may occur (but are not anticipated to occur) during construction activities.
 - Appendix C of this EPP (Drawings/Details) illustrate and describe general mitigation outlined in the WMT EPP.
 - Appendix D of this EPP (Resource-Specific Mitigation Table) details known environmental features and recommended mitigation measures at the WMT.
 - Appendix E of this EPP (WMT Environmental Facility Drawing) illustrates environmental considerations at the WMT construction site.
 - Appendix F of this EPP (Consultation and Engagement) contains a summary of the consultation efforts completed by Trans Mountain for the Project.
 - Appendix G of this EPP (Aboriginal Groups Engaged on the WMT EPP) contains a summary of the Aboriginal groups engaged on this EPP.
 - Appendix H of this EPP (Marine Water Quality Management Plan during Rip Rap Removal) provides a summary of the water quality measures to be implemented during rip rap removal at the WMT.

3.0 CONSULTATION AND ENGAGEMENT

Consultation and engagement activities related to the mitigation measures in the WMT EPP were conducted between May 2012 and February 2017 with Appropriate Government Authorities and potentially affected Aboriginal groups. Opportunities to discuss the WMT construction and issues or concerns were provided to public stakeholders through online information, workshops, meetings and ongoing engagement activities during the reporting period. Appendix F includes a comprehensive record of these engagement activities, stakeholder feedback and Trans Mountain responses.

The draft of the updated WMT EPP was released on November 17, 2016 for review. Feedback was requested by February 24, 2017. Trans Mountain incorporated any feedback into the final WMT EPP or has provided rationale for why input has not been included, as summarized in Appendix F.

4.0 ENVIRONMENTAL COMPLIANCE

Environmental compliance is facilitated through sharing of information, providing orientation/training, retaining qualified personnel and providing on-site inspection of activities through a proactive and adaptive inspection program.

Trans Mountain has developed a Compliance Management Plan (CMP) (Volume 10 of the Environmental Plans) (to support the construction execution plan and to ensure full compliance with all applicable legal requirements, regulations, permits, approval conditions and commitments made by Trans Mountain. In addition, an Environmental and Compliance Education Program (the Program) has been designed to ensure that all Project personnel are trained and aware of roles and responsibilities, as well as imparting critical information regarding environmental protection, mitigation and compliance requirements. A description of the Program was previously found in Section 4.3 of this WMT EPP, and has now been relocated to Section 4.2 of the CMP (Volume 10 of the Environmental Plans). Roles and responsibilities can be found in Section 1.0 and Appendix A of the CMP (Volume 10 of the Environmental Plans) (previously found in Section 4.4 of this WMT EPP) and the Project Organizational Structure prepared to meet NEB Condition 88 (Section 1.0 of Volume 6 of the Environmental Plans).

As part of the CMP, Trans Mountain established the ISLMS pursuant to Section 6 of the 2013 *NEB OPR*. The NEB expects that companies have effective management systems and protection programs that provide for continual improvement. The management system must apply to all of the company's activities, including the design and construction of a pipeline. The ISLMS outlines KMC's commitment to establishing, implementing and monitoring processes and controls to ensure that it is conducting business in a safe, environmentally responsible and sustainable manner. ISLMS describes how the company operates in a way that minimizes risk to its employees, Contractors, the public and the environment throughout the life cycle of the Project. Information of the ISLMS was previously found in Section 4.2 of the WMT EPP, but has been relocated to Section 1.0 of the CMP (Volume 10 of the Environmental Plans).

During the course of construction, it may be necessary to modify or create new procedures to address site conditions not previously identified in the WMT EPP. Field-based decision-making and Project approved contingency plans will be implemented to address unexpected conditions, as described in Field Level Environmental Change Management in Section 4.4 of the CMP. Section 2.7 of the CMP includes the Management of Change (MOC) processes, which outline the process for the development or modification of procedures, if changes cannot be managed at the field level. Information for the MOC processes was previously found in Section 4.7 of the WMT EPP, but has been relocated to Section 2.7 of the CMP (Volume 10 of the Environmental Plans).

4.1 Potential Permits, Approvals and Authorizations

While these tables are comprehensive, they are not exhaustive and additional permits may be required. Hard copy permits, approvals and authorization binders will be assembled with the applicable documents on file and will remain at the construction offices throughout the construction and commissioning phases of the Project.

TMPL is regulated by the NEB, a fully independent agency of the Government of Canada. As an NEB federally-regulated entity, TMPL requires approval from the NEB prior to the construction of TMEP. TMPL also complies with all ancillary legislation, unless it conflicts with or frustrates federal legislation, in which case, TMPL will comply with federal legislation, as ultimately determined by the NEB.

TABLE 4.1-1

POTENTIAL FEDERAL ENVIRONMENTAL PERMITS AND APPROVALS THAT MAY BE REQUIRED FOR TERMINAL CONSTRUCTION

Regulatory Authority	Legislation	Permit, Approval, Authorization and/or Notification	Activity/Trigger
NEB	Section 52 of the <i>NEB Act</i>	<ul style="list-style-type: none"> • Certificate of Public Convenience and Necessity 	<ul style="list-style-type: none"> • Facility construction
Canadian Transportation Agency	<i>Railway Relocation and Crossing Act</i>	<ul style="list-style-type: none"> • Crossing Permit 	<ul style="list-style-type: none"> • Approval to cross railways with access roads and power lines
Environment and Climate Change Canada	<i>Species at Risk Act (SARA)</i>	<ul style="list-style-type: none"> • Permit pursuant to Section 73 of the <i>SARA</i> 	<ul style="list-style-type: none"> • Activities that affect (<i>i.e.</i>, kill, harm, harass and/or capture) a species listed on Schedule 1 of <i>SARA</i> as endangered or threatened (including wildlife and fish species) and its critical habitat or residence
	<i>Migratory Birds Convention Act, 1994</i>	<ul style="list-style-type: none"> • Migratory Bird Damage or Danger Permit 	<ul style="list-style-type: none"> • Installation and use of permanent deterrent devices to prevent birds from nesting in areas that could cause damage or danger to infrastructure, or injury to the birds themselves.
Fisheries and Oceans Canada (DFO)	<i>Fisheries Act</i> , Section 35(2)	<ul style="list-style-type: none"> • Case-specific request for review; may trigger a Request for Authorization 	<ul style="list-style-type: none"> • Authorization required if construction will result in serious harm to fish that are part of, or support, a commercial, recreational, or Aboriginal fishery
	<i>Canadian Shipping Act and Safety of Life at Sea Convention</i>	<ul style="list-style-type: none"> • Notification as per <i>Canadian Shipping Act and Safety of Life at Sea Convention</i> 	<ul style="list-style-type: none"> • Marine Communications and Traffic Services oversight of marine traffic within Canadian jurisdiction (DFO)
Industry Canada	<i>Radiocommunication Act</i>	<ul style="list-style-type: none"> • Radio Licence 	<ul style="list-style-type: none"> • Radio communication
Vancouver Fraser Port Authority (VFPA)	<i>Canada Marine Act</i>	<ul style="list-style-type: none"> • Project Permit • Building Permit • Water Lease Expansion 	<ul style="list-style-type: none"> • Approval for new structures on water or land including modifications to existing structures
Transport Canada	<i>Canada Shipping Act</i>	<ul style="list-style-type: none"> • An act respecting shipping and navigation 	<ul style="list-style-type: none"> • Ensure compliance of vessels with relevant marine regulations

TABLE 4.1-2

POTENTIAL PROVINCIAL ENVIRONMENTAL PERMITS, APPROVALS AND AUTHORIZATIONS

Regulatory Authority	Permit, Approval, Authorization and/or Notification
British Columbia (BC) Ministry of Forests, Lands and Natural Resource Operations (BC MFLNRO)	<ul style="list-style-type: none"> • <i>Heritage Conservation Act</i> permits (<i>e.g.</i>, Heritage Alteration Permit [Section 12] and Heritage Inspection Permit – Clearance and Fossil Resource Permit). • Scientific Fish Collection Permit.
BC Ministry of Transportation and Infrastructure	<ul style="list-style-type: none"> • Various permits under the <i>Transportation Act</i>, including: <ul style="list-style-type: none"> - Sign Permit; - Structure Permit; - Work Notification or Land Closure Request Permit; - Clearing and Grubbing Permit; and - Revegetation Permit. • Various permits under the <i>Industrial Roads Act</i>, including: <ul style="list-style-type: none"> - Highway Access Permit; - Controlled Highway Access Permit; and - Access/Road Construction within Right-of-Way. • Commercial Vehicle Permit under the <i>Commercial Transport Act</i>.
BC Ministry of Environment (BC MOE)	<ul style="list-style-type: none"> • Section 14 Permit under the BC <i>Environmental Management Act</i> for the introduction of waste into the environment. • Section 7 Waste Discharge Permit under the <i>Waste Discharge Regulation</i> for testing and disposing of test water with additives.

5.0 NOTIFICATION OF INTERESTED PARTIES

Notification of the construction schedule and timing of specific construction activities will facilitate awareness of upcoming activities and allow Appropriate Government Authorities and potentially affected Aboriginal groups to plan, as appropriate, for construction activities in the area of interest. The following measures will be implemented by Trans Mountain, the Contractor and/or the subcontractor to ensure notification of interested parties in advance of, and during, construction of facilities and access roads. Notifications will be coordinated with the Trans Mountain Stakeholder Engagement and Communications Team and will reflect the commitments outlined in the VFPA Permit. Regulatory notifications and permit applications will be coordinated with the Trans Mountain Regulatory and Compliance Team (RCT).

Objective

The objective of notification of interested parties is to ensure:

- work adheres to applicable approval conditions;
- interruptions to other marine activities (*i.e.*, recreational operators and commercial activity) are limited during construction of the WMT;
- applicable interested parties are aware of construction activities at WMT; and
- Appropriate Government Authority representatives are kept informed throughout construction at the WMT.

Contacts	Notification Measures
<i>Federal Authorities</i>	<ol style="list-style-type: none">1. Notify the NEB, as per NEB Condition 62, of the anticipated construction schedule identifying the major construction activities expected and, on a monthly basis, on the first working day of each calendar month from the commencement of construction until after commencing operations, provide updated detailed construction schedules.2. Submit monthly construction progress reports to the NEB as per NEB Condition 106, from commencement of construction until after commencing operations. Monthly reports are to include any environmental issues and non-compliance that occurred, and measures undertaken to resolve these environmental issues and non-compliance.3. Notify VFPA of the anticipated construction schedule (see Appendix A of this EPP). Adhere to VFPA Permit advance notice requirements. Contact will be maintained until Project completion.4. Notify DFO prior to the commencement of marine works. Refer to the <i>Fisheries Act</i> Authorization to determine the advance notice required by DFO.5. Conduct hydrostatic testing activities in accordance with the <i>NEB OPR</i>, provincial legislation, Transport Canada's <i>Minor Works for Water Intakes</i> (Transport Canada 2009) as well as the latest version of Canadian Standards Association (CSA) Standard Z662 (CSA 2015) and the <i>Waste Discharge Regulation</i>, BC Reg. 320/2004.6. Ensure that the necessary notifications are provided for applicable permits that must be obtained prior to beginning activities. A list of the potential federal permits, approvals and authorizations is provided in Table 4.1-1. Additional permits beyond those listed in Table 4.1-1 may be required.

Contacts	Notification Measures
<i>Provincial Authorities</i>	7. Notify the BC Environmental Assessment Office prior to entry on Crown lands in BC, as required. 8. A notice of Construction Start must be submitted to the BC Oil and Gas Commission (BC OGC), 48 hours prior to equipment arriving on location. 9. Follow the applicable requirements outlined in the <i>Waste Discharge Regulation</i> (BC MOE 2004) before, during and after the discharge of hydrostatic test fluid to land. 10. Ensure that the necessary notifications are provided for applicable permits that must be obtained prior to beginning activities. A list of the potential provincial permits, approvals and authorizations is provided in Table 4.1-2. Additional permits beyond those listed in Table 4.1-2 may be required.
<i>Government Authority Liaison</i>	11. Inform all appropriate federal (<i>e.g.</i> , Health Canada, Industry Canada, Environment Canada, the NEB and DFO), provincial (<i>e.g.</i> , BC Parks, BC OGC and BC MFLNRO) and municipal resource agencies of the Project developments, as warranted. Regular liaison with government representatives (<i>e.g.</i> , the NEB, DFO, BC OGC and BC Parks) during construction will be the responsibility of the Trans Mountain Environmental Manager, the Senior Compliance Advisor, or designate.
<i>Aboriginal Groups</i>	12. Provide Aboriginal groups with the anticipated construction schedule and facility location maps, and install signage notifying of construction activities in the area, a minimum of 4 weeks prior to the commencement of construction in the vicinity of their respective communities.
<i>Project Notice</i>	13. Provide notification to residents of construction within urban areas through methods determined in collaboration with municipal and regional authorities. 14. Provide Project contact information to residents, land users and Aboriginal groups for management of construction-related concerns. 15. Install signs at secondary road access points and within the vicinity of construction activities near secondary roads and highways to notify land users of construction activities.
<i>Construction Schedule Change</i>	16. Review the individuals and groups that were initially notified of the construction schedule and notify of any changes in the construction schedule.
<i>Water Users</i>	17. Notify appropriate authorities and licensees, if required by Section 10 of the <i>Water Sustainability Act</i> (in BC) requirements, prior to withdrawing water for hydrostatic testing from sources other than city or municipal water supply.
<i>Marine Operators</i>	18. Notify marine commercial and recreational operators of the hazards associated with construction in accordance with NEB guidelines or approval conditions. Place warning signs (<i>e.g.</i> , Warning - Construction in the Vicinity) in terrestrial and marine environments, near construction activities. Follow conditions of permit approvals granted by the NEB. 19. Notify appropriate regulatory authorities and licensees and/or distribute a notification to the shipping industry in order to advise commercial and recreational marine operators of the Project schedule and construction activities at the WMT.

Note: - See Appendix A of this EPP for Emergency and Project contact lists.

6.0 GENERAL MEASURES

Introduction

The mitigation measures provided in this section may be applicable either through various phases, or for the duration of, construction at the WMT. These general measures will be implemented, as warranted, by Trans Mountain, its Contractors and subcontractors prior to the commencement construction activities, and will be followed by detailed specifications for each phase of the WMT construction.

Objective

The objective of the following mitigation measures is to avoid or reduce potential adverse environmental effects associated with general terrestrial and marine construction activities at the WMT. Construction will be completed in a manner that avoids or reduces adverse effects on residents in the area, marine users, as well as socio-economic and environmental resources. Refer to the Socio-Economic Management Plan (within NEB Condition 72) for broad mitigation measures related to socio-economic effects and reference to Plans that contain more specific mitigation on socio-economic matters. Refer to the Socio-Economic Effects Monitoring Plan prepared for NEB Condition 13 for the monitoring approach and Project-specific indicators related to select socio-economic effects. Contractor requirements pertaining to worker accommodation during construction and further details on the worker code of conduct can be found in the Worker Accommodation Strategy prepared for NEB Condition 59. These plans are contained in Section 2.0 of Volume 6 of the Environmental Plans.

Activity/Concern	Mitigation Measures
<i>Review Mitigation Measures for Environmental Features</i>	<ol style="list-style-type: none"><li data-bbox="537 926 1443 1178">1. The Environmental Inspector will review mitigation measures to be implemented during construction to avoid or reduce effects on environmental features or cultural features on or in proximity to the facility site. This review will be conducted in advance of construction at known locations where any of the above features are known to be present to ensure that suitable and appropriate procedures have been selected and can be implemented prior to construction where applicable.<li data-bbox="537 1178 1443 1493">2. An Environmental Inspector is responsible for monitoring compliance with environmental and socio-economic commitments, undertakings and conditions of permits and approvals, as well as applicable environmental legislation and Trans Mountain's policies, procedures, and industry-accepted standards. An Environmental Inspector may designate responsibility for environmental and socio-economic compliance monitoring in certain cases based on the nature of the activity and the availability of appropriate alternative personnel (e.g., Activity Inspector) (see the Compliance Management Plan in Volume 10 of the Environmental Plans).

Activity/Concern	Mitigation Measures
<i>Review Mitigation Measures for Environmental Features (cont'd)</i>	<ol style="list-style-type: none">3. An Environmental Inspector will organize on-site meetings in consultation with the Construction Manager or designate to address any resource-specific issues, and to review construction methodologies (see the Compliance Management Plan in Volume 10 of the Environmental Plans).4. An Environmental Inspector will review, collect, organize and disseminate all environmentally-related information and documentation that arises during construction, and will be responsible for the preparation of daily Environmental Inspection reports (see the Compliance Management Plan in Volume 10 of the Environmental Plans).5. Environmental information (<i>e.g.</i>, erosion concerns or natural drainage patterns) will be collected by a qualified professional throughout construction for documentation and the assessment of effectiveness of procedures/measures used to aid or inform the decision-making process post-construction (see the Compliance Management Plan in Volume 10 of the Environmental Plans).6. The Environmental Inspector will document construction methods, decisions related to implementation and location of mitigation measures, final reclamation measures and issues encountered. as the Environmental Inspector will also maintain communication records for discussion with BC MFLNRO or other regulatory agencies.7. Refer to the environmental Resource-Specific Mitigation Table (see Appendix D of this EPP) and the Environmental Facility Drawing (see Appendix E of this EPP).
<i>Species at Risk or Species of Concern</i>	<ol style="list-style-type: none">8. Where species at risk or species of concern are discovered during future vegetation, aquatics and wildlife habitat studies, or during construction the facilities, implement the applicable Management Plan in Volume 6 of the Environmental Plans and Contingency Plans (see Appendix B of this EPP).9. Ensure that sighting records for species at risk are provided to an Environmental Inspector. Records will be maintained and made available for reporting to applicable regulatory agencies (<i>e.g.</i>, BC Conservation Data Centre).10. Refer to the environmental Resource-Specific Mitigation Table for aquatics, vegetation and wildlife species at risk or their habitats provided in Appendix D of this EPP. Ensure that all mitigation measures concerning species at risk are communicated to the Contractor and enforced by an Environmental Inspector.11. Suspend activity if previously unidentified species at risk or species of concern are encountered on the work site during construction. Implement the following plans as appropriate:<ul style="list-style-type: none">• Rare Ecological Communities or Rare Plant Species of Concern Discovery Contingency Plan (see Appendix B of this EPP);• Wildlife Conflict Management Plan (see Section 6.5 of Volume 6 of the Environmental Plans); and• Wildlife Species of Concern Encounter and Discovery Contingency Plan (see Appendix B of this EPP).

Activity/Concern	Mitigation Measures
<i>Species at Risk or Species of Concern (cont'd)</i>	<ol style="list-style-type: none">12. Report observations of species of concern immediately to an Environmental Inspector.13. Implement the appropriate vegetation management measures in consideration of species at risk and their habitat (e.g., restrict vegetation management to the minimum width required for the safe operation and inspection of the WMT, and allow vegetation outside of this area to regenerate).14. Minimize the use of herbicides. Consider non-chemical options as the primary method to manage non-woody problem vegetation (e.g., mowing or hand pulling). When non-chemical vegetation management options are not practical (e.g., invasive plant removal) utilize spot treatment applications of herbicides as necessary.
<i>Wildlife (Terrestrial or Marine)</i>	<ol style="list-style-type: none">15. Follow the measures outlined in the Bald Eagle Nest Management Plan: WMT and outlined in Section 7.2 for mitigation measures to be implemented prior to construction.16. Complete migratory bird nest sweeps as necessary prior to construction if construction is initiated during the migratory bird nesting period of March 26 to August 16 (Environment and Climate Change Canada [ECCC, 2017]).17. Clear areas of vegetation outside of the migratory bird nesting period to reduce the risk of migratory birds nesting on the construction site where work is scheduled to occur during the migratory bird nesting period.18. In the event that clearing or construction activities are scheduled to commence within the migratory bird nesting period, consult with a Wildlife Resource Specialist to determine the need to conduct a non-intrusive area search for evidence of nesting (e.g., presence of territorial males, alarm calls, distraction displays and adults carrying nesting material/food). Searches for evidence of nesting should occur within 7 days prior to the construction activity. In the event that there are extended periods of inactivity between construction activities during the migratory bird nesting period (i.e., a period greater than 7 days), consult with an Environmental Inspector regarding the potential need for follow-up searches for evidence of nesting.19. In the event that an active nest is found, it will be subject to site-specific mitigation measures (e.g., clearly marked species-specific buffer around the nest or non-intrusive monitoring). The appropriate mitigation measures will be selected by an Environmental Inspector, in consultation with a Wildlife Resource Specialist (see also the Wildlife Species of Concern Encounter and Discovery Contingency Plan provided in Appendix B of this EPP).20. Discuss wildlife issues that are identified during construction, as necessary, with an Environmental Inspector, a Wildlife Resource Specialist and the appropriate regulatory authority representatives, as directed in the Wildlife Species of Concern Encounter and Discovery Contingency Plan (see Appendix B of this EPP). Refer to the environmental facility drawings provided in Appendix E of this EPP.21. Adhere to the measures in the Noise Management Plan for Construction at Terminals and Pump Stations (Section 10.0 of Volume 6 of the Environmental Plans) to limit the duration of sensory disturbance to wildlife.

Activity/Concern	Mitigation Measures
<i>Wildlife (Terrestrial or Marine) (cont'd)</i>	<ol style="list-style-type: none">22. Implement the Wildlife Species of Concern Encounter and Discovery Contingency Plan (see Appendix B of this EPP) in the event of an encounter with wildlife during construction, either at the construction site or on the commute to or from the construction site. Report any incidents or collisions with wildlife to an Environmental Inspector who will consult with the Appropriate Government Authorities and the local conservation officer, if applicable. Follow the incident reporting processes outlined in the Project ERP (NEB Condition 89) for safety-related incidents.23. Do not harass or feed wildlife. Do not store food in beds of pick-up trucks or areas readily accessible to wildlife.24. Report any incidents or collisions with wildlife with construction equipment or construction infrastructure (e.g., bird entanglement with the safety boom) to an Environmental Inspector or designate. The Environmental Inspector will complete follow up reporting or consultation with the Appropriate Government Authority and the local police detachment, if applicable.25. The Environmental Inspector will collect information on mortality and collision events during construction and will include this information, as applicable, in post-construction monitoring reports for the WMT.26. Notify an Environmental Inspector and contact a wildlife Resource Specialist, as warranted, to determine suitable methods for removal of wildlife trapped inside the construction area.27. Store food in vehicles or equipment, or in the construction office. Do not store food in beds of pick-up trucks or areas readily accessible to wildlife.28. Prohibit all Project personnel from having firearms on the construction site or in Project vehicles.29. Prohibit all Project personnel from having pets on facility sites.30. Install guards and/or wildlife protectors, where warranted, at substations to reduce the risk of avian electrocution.
<i>Archaeological/ Palaeontological Heritage Resources</i>	<ol style="list-style-type: none">31. Follow applicable recommendations identified in the Archaeological Impact Assessment.32. Refer to environmental resource-specific mitigation measures for historical resources provided in Appendix D of this EPP.33. Suspend work in proximity (i.e., within 30 m or other distance as specified in the applicable regulatory permit) to archaeological, palaeontological or historical sites (e.g., arrowheads, modified bone, pottery fragments and fossils) if discovered during construction and notify an Environmental Inspector and Construction Manager, who will contact the Environmental Manager. Implement the contingency measure identified in the Heritage Resources Discovery Contingency Plan (see Appendix D of this EPP). No work at that particular location shall continue until permission is granted by the Environmental Manager in consultation with a Resource Specialist, or, if warranted, the Appropriate Government Authority. For more information, refer to Heritage Resources prepared for NEB Condition 100 (Section 2.0 of Volume 6 of the Environmental Plans).34. Prohibit the collection of historical, archaeological or palaeontological resources by Project personnel.

Activity/Concern	Mitigation Measures
<i>Archaeological/ Palaeontological Heritage Resources (cont'd)</i>	35. Avoid disturbance of geodetic or legal survey monuments, to the extent feasible. If a geodetic monument is disturbed during construction of the WMT, the Construction Manager or designate will immediately report such disturbance to a Trans Mountain representative who will report such disturbance to the Appropriate Government Authority. The monument will be re-established, where feasible, in accordance with the instructions of the Dominion Geodesist.
<i>Noise Emissions</i>	36. Adhere to applicable federal (<i>i.e.</i> , Environment Canada, <i>Motor Vehicle Safety Act</i> and <i>Oil and Gas Occupational Safety and Health Regulations</i>) and provincial (<i>i.e.</i> , <i>BC Noise Control Best Practices Guidelines</i> [BC OGC 2009], <i>Worker's Compensation Act</i> and <i>Occupational Health and Safety Regulations</i>) guidelines and legislation for noise management, where feasible. Ensure that work is carried out in accordance with the Noise Management Plan for Construction at Terminals and Pump Stations provided in Section 10.0 of Volume 6 of the Environmental Plans. 37. Enforce vehicle speed limits. Use of engine retarder braking in urban areas is prohibited. 38. Ensure that tools and equipment utilized are proportionate to the activity being conducted to limit excessive noise resulting from construction. Locate compressors and generators away from noise receptors, to the extent feasible. 39. Use vibratory methods of pile installation, to the extent feasible. Limit impact pile driving to daytime only, if feasible.
<i>Waste and Hazardous Material Storage</i>	40. Follow measures outlined in the Waste Management Plan (see Section 3.1 in Volume 6 of the Environmental Plans) for storage of waste or hazardous materials on the work site. 41. Personnel will be made aware of their responsibilities for proper handling, identification, documentation and storage of hazardous materials and wastes. 42. Personnel handling hazardous materials and wastes will possess valid Workplace Hazardous Materials Information System (WHMIS) training (Health Canada 2015). 43. An appropriate number of portable toilets or wash facilities will be made available to ensure that facility construction crews have ready access to washroom facilities. Service and clean facilities regularly and ensure that they are adequately secure. 44. Store bulk hazardous waste or hazardous materials in accordance with applicable regulatory requirements. Store wastes in designated areas and dispose in accordance with the Waste Management Plan provided in Section 3.1 of Volume 6 of the Environmental Plans. 45. Store fuel, oil or hazardous materials required to be stored on-site within secondary containment. Fuel, oil or hazardous materials stored on the terrestrial component of the WMT is to be located greater than 100 m from a watercourse or wetland.

Activity/Concern	Mitigation Measures
<i>Waste and Hazardous Material Storage (cont'd)</i>	<p>46. Store bulk tanks containing hazardous materials (e.g., fuel for construction equipment) in a bermed area lined with an impervious polyethylene liner. Secondary storage for fuel storage tanks is required for volumes exceeding 1,000 L. Design and size secondary containment for hydrocarbons in accordance with applicable provincial and federal requirements. Remove any rainwater that accumulates within the containment structure, if directed by an Environmental Inspector. If there is a visible sheen or odour, the water in the containment structure should be characterized for disposal at an approved facility.</p> <p>47. Maintain documentation on all hazardous materials or wastes being stored at the facility sites.</p> <p>48. Visually inspect fuel tanks on a regular basis, as well as when the tank is refilled. Maintain inspection records for each tank. Take remedial action as soon as a leak is detected.</p>
<i>Waste Disposal</i>	<p>49. Collect construction debris and other waste materials on a regular basis and dispose of it at an approved facility and in accordance with the Spill Contingency Plan (see Appendix B of this EPP) and the Waste Management Plan (see Section 3.0 in Volume 6 of the Environmental Plans). Recycle wastes to the extent feasible.</p> <p>50. Store garbage in wildlife-proof containers when potential wildlife/human conflicts may occur.</p> <p>51. Ensure that the construction site is left in a tidy and organized condition at the end of each day.</p>
<i>Scheduling</i>	<p>52. All nearshore in-water Project construction activities (within a 50-m horizontal distance seaward of the higher high water large tide level) at the WMT that have the potential to harm fish are restricted to a modified work timing window from August 16 to March 15 each year.</p> <p>53. Review and abide by all applicable timing restrictions and least risk biological windows as shown in the Resource-Specific Mitigation Table and Environmental Facility Drawings (Appendices D and E of this EPP), where feasible. When construction activities are scheduled outside of preferred construction timing windows, ensure that necessary regulatory approvals are in place. Refer to the Resource-Specific Mitigation Tables (Appendix D of this EPP) for mitigation measures and preferred timing windows.</p> <p>54. In the event that a permit or approval is likely to expire prior to the completion of the applicable construction activities, notify Trans Mountain well in advance of the expiration date (e.g., 1 month) to obtain renewal or extension of the permit and/or approval.</p> <p>55. Schedule construction activities in consideration of applicable approval conditions and municipal bylaws, where feasible.</p>
<i>Roads and Access</i>	<p>56. Confine construction activities to the allotted construction footprint and approved temporary workspace (e.g., grade areas). Restrict construction traffic to existing roads.</p>

Activity/Concern	Mitigation Measures
<i>Construction Traffic</i>	<p>57. Establish speed limits, approved by Trans Mountain, and in compliance with provincial regulation, on access roads and on the construction site. Post signs stating the applicable speed limits for construction traffic.</p> <p>58. Adhere to the mitigation measures provided in the Access Control and Management Plan, prepared pursuant to NEB Condition 73.</p> <p>59. Transport construction personnel to and from the WMT site by multi-passenger vehicle, to limit traffic volume and the potential for vehicle/wildlife interactions.</p> <p>60. Implement wheel washing for equipment leaving the WMT and entering public roads, where warranted, if vehicles/equipment is not subject to a wash-down. Shovel and sweep clean, as quickly as practical, any mud, soils debris or foreign material tracked onto roads from vehicles leaving the construction site.</p>
<i>Public Access</i>	<p>61. Maintain existing access control measures (e.g., signs, gated entry and fencing) at the WMT.</p>
<i>Air Quality/ Odour/Greenhouse Gas Emissions</i>	<p>62. 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 or occupied by the respective landowners and/or occupants.</p> <p>63. Restrict the duration that vehicles and equipment are allowed to sit and idle, to the extent practical.</p> <p>64. Conduct work at facilities in accordance with the measures contained in the following management plans as applicable:</p> <ul style="list-style-type: none">• Air Emissions Management Plan for WMT (Section 10.0 of Volume 6 of the Environmental Plans); and• Fugitive Emissions Management Plan for WMT (Section 10.0 of Volume 6 of the Environmental Plans). <p>65. Burning of slash is prohibited in the Lower Fraser Valley and Greater Vancouver areas including the WMT and Westridge Delivery lines from KP 0 to KP 3.4.</p>
<i>Lighting</i>	<p>66. Design lighting requirements at the WMT to meet the <i>Canada Occupational Health and Safety Regulations</i> and the International Ship and Port Facility Security Code (for compliance), for worker safety and terminal security during construction, while minimizing environmental and socio-economic effects. Refer to the Lighting Emissions Management Plan for the WMT (NEB Condition 82).</p> <p>67. Where feasible, prevent sky-lighting, which may lead to bird disorientation and/or collisions by: using low-level and low-intensity lighting; using no lighting in areas where no work is planned; using downturned shaded fixtures in light standards; and using a higher lumen/watt (light out to power in) ratio, such as metal halide lighting.</p> <p>68. During migratory bird periods and/or during extreme weather events, bird strike warnings will be issued to marine construction vessels with a request to reduce deck lighting.</p>

Activity/Concern	Mitigation Measures
<i>Lighting (cont'd)</i>	69. Direct lighting for construction activities downward and, where feasible, position it to avoid or reduce annoyance of nearby residents. 70. Install lighting control systems in the facility site that permit the reduction of the amount of lighting during periods of low activity. 71. Use lighting in the yellow spectrum, where feasible, to reduce disruption to nocturnal fish activities and bird strikes.
<i>Recreational Activities</i>	72. Prohibit recreational activities (e.g., fishing, hunting, swimming and diving) by Project personnel from or in the vicinity of the WMT.
<i>Spill Prevention</i>	73. Report spills immediately to an Environmental Inspector, who will notify the Senior Compliance Advisor for reporting to the Appropriate Government Authorities in accordance with the Spill Contingency Plan (see Appendix B of this EPP). 74. Maintain all appropriate spill equipment at all work sites. Assess the risk of spills to determine the appropriate type and the quantity of spill response equipment and materials to be stored on-site and in a suitable location for storage. Ensure that Operators and on-site Construction Foremen are trained to contain spills or leakage from equipment. 75. Post specific instructions at the field construction offices and in construction environmental training handbooks regarding applicable contacts and appropriate response actions to be taken in the event of a spill, including the measures provided in the Spill Contingency Plan (see Appendix B of this EPP) and contacts for spill reporting (see Appendix A of this EPP). 76. Place an impervious tarp or drip tray underneath equipment and vehicles when performing service and routine maintenance (e.g., oil changes and servicing of hydraulic systems). 77. Store all hazardous substances and fuels in proper containment systems, to prevent release to the environment. Handle all hazardous materials in accordance with applicable WHMIS protocols. 78. Ensure that during construction no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides or other chemicals are dumped onto the ground or into the marine environment. In the event of a spill onshore that does not have the potential to migrate into the marine environment, implement the Spill Contingency Plan (see Appendix B of this EPP). In the event of a spill in the marine environment or onshore with the potential to migrate into the marine environment, implement the Marine Spill Contingency Plan (see Appendix B of this EPP). 79. Ensure that bulk fuel trucks, service vehicles and pick-up trucks equipped with box-mounted fuel tanks carry spill prevention, containment and clean-up materials that are suitable for the volume of fuels or oils carried. Carry spill response supplies on bulk fuel and service vehicles that are suitable for use on land and water (i.e., sorbent pads, sorbent boom and rope).

Activity/Concern	Mitigation Measures
<i>Spill Prevention (cont'd)</i>	<p>80. Employ the following measures to limit the risk of fuel spills in water if refueling within 100 m of the marine environment is necessary and is approved by an Environmental Inspector:</p> <ul style="list-style-type: none">• all containers, hoses and nozzles are free of leaks;• all fuel nozzles are equipped with automatic shut-offs;• Operators are stationed at both ends of the hose during fuelling, unless the ends are visible and readily accessible by one Operator; and• fuel remaining in the hose is returned to the storage facility. <p>81. Do not wash equipment or machinery in the marine environment. Control wastewater from construction activities to avoid discharge directly into the marine environment.</p>

7.0 TERRESTRIAL CONSTRUCTION

7.1 General Terrestrial Measures

Introduction

The following mitigation measures will be implemented as needed during the onshore construction of the WMT.

Objective

The objective of these mitigation measures is to avoid or reduce potential adverse environmental effects associated with the terrestrial component of the WMT construction activities.

Activity/Concern	Mitigation Measures
<i>Roads and Access</i>	<ol style="list-style-type: none">1. Confine construction activities to the allotted construction footprint and approved temporary workspace (e.g., grade areas). Restrict construction traffic to approved roads.2. During construction, use flagging, staking, fences or signs to delineate the boundaries of the WMT, access roads, and environmental features of concern that require protection.3. Apply appropriate measures (e.g., signs, boundary markers, gates and fences) to ensure that Project vehicles remain on the designated access.4. Install and maintain signs, gates or other temporary barriers at potential access points to the WMT or temporary construction access to deter unauthorized access during the construction period.5. Deactivate and reclaim temporary construction access that does not have a third-party disposition to native vegetation or pre-construction land use. Implement access controls on deactivated temporary roads.
<i>Drainage</i>	<ol style="list-style-type: none">6. Reduce the potential for soil erosion by water during construction activities by avoiding ponding of water or the unintentional channelization of surface water flow.7. Maintain existing surface drainage across the WMT, to the extent feasible. Restore drainage patterns following construction where surface drainage was disrupted due to construction activities.
<i>Hydrogeology</i>	<ol style="list-style-type: none">8. Consult the Hydrogeological Resource Specialist to determine if wells located within the vicinity of the construction site will be sampled for water quality and flow rate prior to the commencement of construction.9. Existing Trans Mountain groundwater monitoring wells will be pre-identified and flagged prior to construction. Groundwater monitoring wells will be decommissioned in accordance with applicable provincial guidelines in the event they will be disturbed by construction activities

Activity/Concern	Mitigation Measures
<i>Erosion and Sedimentation</i>	<ol style="list-style-type: none">10. Prepare a site-specific Erosion and Sediment Control Plan (ESC) in compliance with regulatory requirements and submit to the Environmental Inspector for review.11. Ensure that excavation and construction procedures are undertaken in such a manner as to prevent sediment-laden runoff from the site of the work from directly entering natural drainage systems or marine environment.12. Ensure that disturbed areas are kept dewatered with concentrated surface runoff either directed around work areas with interceptor ditches or temporarily contained within closed conduits.13. Direct concentrated surface runoff to water conveyance and storage features (e.g., settling pond). Ensure that water contained in on-site settling ponds, or an approved equivalent, is treated and, where warranted, sampled prior to discharge (refer to Monitoring mitigation measures provided below in this section).14. Manage the potential for off-site migration of sediments through the installation of erosion and sediment control measures (e.g., coir logs, erosion control matting, sediment fence and crushed gravel) where indicated in the ESC. Ensure that surface runoff not collected into water conveyance and storage features passes through installed erosion and sediment control features prior to migration off-site.
<i>Monitoring</i>	<ol style="list-style-type: none">15. Regularly monitor erosion and sediment control measures in accordance with regulatory requirements and the ESC (i.e., a minimum of weekly during normal operations and daily during storm events). Initiate corrective measures or implement supplemental erosion and sediment control measures in areas where deficiencies are noted, in consultation with the Environmental Inspector.16. Monitor turbidity and/or total suspended solids (TSS) concentrations during construction to ensure that water discharged from the site does not have TSS in excess of 25 mg/L (dry conditions) or 75 mg/L (rainy conditions) above background levels of the receiving water prior to discharge.
<i>Dust Control</i>	<ol style="list-style-type: none">17. Consult with land agents to provide opportunities for nearby residents with the potential to be affected by dust emissions from construction to report on issues related to dust emissions so that corrective actions can be implemented, if warranted.18. Water down the construction footprint, when warranted, to reduce or avoid the potential for dust emissions due to soil pulverization. Increase the frequency of watering roads and sites during periods of high risk (e.g., high winds or periods of drought). Additional dust abatement measures will be implemented, when warranted and approved by an Environmental Inspector.19. Ensure that watering of the construction footprint does not generate excessive formation of surface water accumulation (i.e., puddles or excessive mud generation) or result in overland water flow or sedimentation of nearby watercourses or the marine environment.20. Implement wheel washing for equipment leaving the WMT and entering public roads, where warranted, if vehicles/equipment is not subject to a wash-down.

Activity/Concern	Mitigation Measures
<i>Weeds</i>	<p>21. Ensure that equipment arrives at construction sites clean and free of soil or vegetative debris. Inspect, verify, and document clean equipment.</p> <p>22. Clean equipment (<i>i.e.</i>, shovel and sweep, pressurized water or compressed air) involved in topsoil/root zone material handling at weed-infested sites prior to leaving the location. Clean equipment involved in topsoil handling at weed-infested sites prior to leaving the location.</p> <p>23. Develop weed control plans in consideration of the requirements of local municipalities and the Line List. Refer to the Weed and Vegetation Management Plan provided in Section 5.0 of Volume 6 of the Environmental Plans.</p>
<i>Use of Herbicides</i>	<p>24. Restrict the application of herbicides to licensed applicators.</p> <p>25. Restrict the application of herbicide within 30 m of known rare plant populations or rare plant communities. Spot spraying, wicking, mowing or hand-picking are acceptable weed control measures in proximity to rare plants and rare plant communities.</p> <p>26. Follow all regulatory requirements for herbicide use adjacent to waterbodies and wells. Consult with potentially affected Aboriginal groups and the VFPA prior to the use of herbicides. The VFPA prefers that non-chemical means of weed control are used wherever feasible.</p>
<i>Work Around the Marine Environment</i>	<p>27. Ensure that approvals are in place prior to work on the upland area adjacent to the marine environment.</p> <p>28. Install sediment fences at the base of cut/fill areas to reduce sediment discharge into the marine environment, where warranted (see Drawing 1 [Sediment Fence] provided in Appendix C of this EPP).</p> <p>29. Maintain sediment fences in place at the base of cut/fill areas, where warranted, until revegetation is stable.</p>
<i>Contaminated Soils</i>	<p>30. Implement the Contamination Discovery Contingency Plan (see Appendix B of this EPP) in the event that contaminated soils are discovered during construction. Adhere to applicable measures provided in the Waste Management Standard and Contamination Identification and Assessment Plan (provided in Section 3.0 of Volume 6 of the Environmental Plans) for handling of contaminated material.</p>
<i>Traditional Land and Resource Use</i>	<p>31. Implement the contingency measures identified in the TLU Sites Discovery Contingency Plan (see Appendix B of this EPP) in the event that TLU sites not previously identified are found during facility construction. Notify an Environmental Inspector who will collaborate with an Aboriginal Monitor for protection of these features.</p>

7.2 Surveying, Clearing and Access

Introduction

The following mitigation measures will be implemented by Trans Mountain, its Contractors and subcontractors during surveying, clearing of vegetation and accessing of the WMT construction site.

Objectives

The objectives of these mitigation measures are to:

- reduce or avoid adverse effects to the terrestrial construction footprint; and
- limit disturbance of vegetation, to the extent practical.

Activity/Concern	Mitigation Measures
<i>Schedule</i>	<ol style="list-style-type: none"> 1. Refer to scheduling and wildlife information provided in Section 6.0 of this EPP.
<i>Bald Eagle Nesting Site</i>	<ol style="list-style-type: none"> 2. Determine if any active stick nests (<i>e.g.</i>, bald eagle and great blue heron) are located in the area to be cleared or adjacent to the WMT immediately prior to clearing. Follow the measures outlined in the Bald Eagle Nest Management Plan: WMT for mitigation measures to be implemented prior to construction. These measures include: <ul style="list-style-type: none"> • The eagles are expected to disperse from the Project area by mid to late August, with adults returning in October to evaluate/initiate nesting. Install nest deterrent within the known bald eagle nest at the WMT upon confirmation that the nest is inactive and the bald eagles have dispersed from the area. Adhere to the conditions of the <i>Wildlife Act</i> Permit (Permit SU17-264155) issued for the installation of the nest deterrent. • Install artificial nests within two alternate nest trees to reduce the risk of lost nesting opportunities. • The nest deterrent and artificial nests will be installed by a qualified arborist upon confirmation that the nest is inactive and the eagles have dispersed from the area. The installation will be completed prior to October 2017 (when nest evaluation and territory establishment is expected to occur).
<i>Staking/Flagging/Fencing</i>	<ol style="list-style-type: none"> 3. Stake all boundaries of the facility construction footprint, including access roads and borrow sites. 4. Stake or flag environmental features and buffers (<i>e.g.</i>, archaeological site, rare plant species and wildlife habitat features) prior to commencing construction to avoid the resource site. Clearly mark all resource-specific environmental features identified on the WMT Environmental Facility Drawing prior to construction, as warranted. 5. Confirm locations of environmental features and ensure staking, flagging or fencing is maintained during construction. 6. Prior to commencement of clearing or construction activities, ensure that boundary and environmental feature flagging/staking has been surveyed and remains intact. Stake and label topsoil/root zone material and spoil stockpiles.

Activity/Concern	Mitigation Measures
<i>Signage</i>	7. Post signs in the vicinity of environmental features to alert construction personnel of their presence. Recommended setback distances are resource-specific, and should be determined in consultation with an Environmental Inspector and/or Resource Specialist, if required.
<i>Clearing</i>	8. Confine all clearing/mowing within the staked/flagged construction footprint boundaries. Do not clear, mow or grade beyond the stakes. Clear vegetation from only those areas essential for construction. Adhere to clearing restrictions associated with special environmental features and buffer areas in addition to those areas outlined in the Resource-Specific Mitigation Table (see Appendix D of this EPP).
<i>Grubbing</i>	9. Postpone root grubbing until immediately prior to grading within the facility boundary, if practical, and where there is a potential for soil erosion to occur, due to sloping terrain and erodible soils.
<i>Shrubby Vegetation Disposal</i>	10. Clear and chip shrubby vegetation or mulch (mulch not to exceed a depth of 5 cm) where grading will not be required and a smooth work surface is required. Dispose of excess chips at an approved location outside of the WMT site. 11. Ensure there is no burning of vegetation or construction waste.
<i>Gates</i>	12. Install construction fencing around newly cleared areas outside of the existing WMT site following clearing. Keep gates locked and assign security personnel to block access, if warranted.
<i>Bar Ditch and Foreign Line Ramps</i>	13. To facilitate access across the railway, construct foreign line ramps with borrow material (not topsoil/root zone material), as per agreement with the owner of the rail facility. 14. Install culverts in bar ditch ramps to maintain drainage. Culvert specifications will be determined by the Project Engineer in consultation with the Environmental Inspector.
<i>Construction Traffic</i>	15. Restrict construction traffic on the shoreline to approved access points. 16. Establish speed limits, approved by Trans Mountain, and in compliance with provincial regulation, on access roads and on the construction site. Post signs stating the applicable speed limits for construction traffic. 17. Transport construction personnel to and from the facility site by multi-passenger vehicle, to limit the potential for vehicle/wildlife interactions and to limit traffic volume and congestion on-site. 18. Implement wheel washing for equipment leaving the WMT and entering public roads, where warranted, if vehicles/equipment is not subject to a wash-down. Shovel and sweep clean, as quickly as practical, any mud, soils debris or foreign material tracked onto roads from vehicles leaving the construction site.

7.3 Soils Handling and Grading

Introduction

The following mitigation measures will be implemented by Trans Mountain, its Contractors and subcontractors during terrestrial construction at the WMT site.

Objective

The objective of these mitigation measures is to avoid or reduce effects on topsoil/root zone material productivity and surface drainage patterns, and to conserve surface material in order to facilitate reclamation of disturbed areas.

Activity/Concern	Mitigation Measures
<i>Resource-Specific Environmental Features</i>	<ol style="list-style-type: none"> 1. Refer to mitigation measures provided under the Staking/Flagging/Fencing and Signage headings in Section 7.2 of this EPP. Confirm the placement of stakes, flags and signage along the construction sites following clearing and prior to topsoil/root zone material handling and grading. Replace any stakes, flags and signage damaged during pre-clearing. 2. Review resource-specific locations to be avoided during topsoil/root zone material salvage and grading activities.
<i>Wet Soil Conditions</i>	<ol style="list-style-type: none"> 3. Adhere to the measures outlined in the Wet Soils Contingency Plan (see Appendix B of this EPP) if wet soil conditions are encountered prior to the removal of topsoil/root zone material from the development area.
<i>Topsoil/Root Zone Material Salvage</i>	<ol style="list-style-type: none"> 4. Salvage topsoil/root zone material from the development zone and areas to be graded within the construction footprint that will be disturbed during construction.
<i>Topsoil/Root Zone Material Salvage Depth</i>	<ol style="list-style-type: none"> 5. Salvage all available topsoil/root zone material (minimum 15 cm or 50% organic material), unless the material is unsuitable (e.g., bedrock, gravel, rock and/or disturbed land). Where soils are not readily distinguishable by colour, an Environmental Inspector and Resource Specialist will provide direction based on an evaluation of soil texture and structure. 6. Salvage very shallow surface soils to a minimum depth of 15 cm. If minimum depth of surface soils cannot be salvaged because the underlying material is unsuitable (e.g., gravel and rock), salvage all available topsoil/root zone material.
<i>Storage of Topsoil/Root Zone Material/Spoil</i>	<ol style="list-style-type: none"> 7. Map the locations of topsoil/root zone material piles on as-built drawings to ensure that they can be easily located in the future to support reclamation efforts at the site. 8. Should quantities of salvaged topsoil/root zone material reduce the practicality of on-site storage, haul excess material off-site for disposal at an approved location or as directed by Trans Mountain. 9. If off-site movement of salvaged topsoil/root zone material or spoil is required, adhere to conditions specified in the applicable permits.

Activity/Concern	Mitigation Measures
<i>Topsoil/Root Zone Material/Grade Spoil Separation</i>	10. Keep spoil piles separate from topsoil/root zone material piles. Maintain a minimum separation distance of 1 m between topsoil/root zone material and grade spoil piles or place a barrier (e.g., approximately 15 cm thick straw barrier, tarps or other material approved by an Environmental Inspector) at areas where a 1 m separation cannot be maintained between topsoil/root zone material and spoil stockpiles due to workspace limitations.
<i>Grading</i>	11. Ensure that there is no grading beyond the stakes. Grade only those areas essential for construction. 12. Grade, if required, to level the surface to be developed. Grade the surface to facilitate water drainage into water conveyance features (e.g., ditches and culverts). 13. Ensure that grade spoil does not migrate off-site. 14. Clearly identify grade spoil with signs or staking where the topsoil/spoil colour change is not obvious.
<i>Monitor Topsoil/Root Zone Material Stockpiles</i>	15. Monitor topsoil/root zone material piles during the growing season for erosion and weed growth until the soils are removed from site, replaced or stored in berms. Implement remedial measures to control erosion, when warranted (see the Soil Erosion and Sediment Control Contingency Plan in Appendix B of this EPP), and weed growth (see Weed and Vegetation Management Plan provided in Section 5.0 of Volume 6 of the Environmental Plans).

7.4 Facility Construction

Introduction

The following mitigation measures may be implemented during the construction of the WMT.

Objectives

The objectives of these mitigation measures are to:

- ensure that construction activities are conducted in accordance with all approval conditions and permits; and
- avoid or reduce potential adverse environmental effects associated with general facility construction activities.

Concern/Activity	Mitigation Measures
<i>Site Preparation</i>	<ol style="list-style-type: none"> 1. Do not drive or set equipment on portions of the facility site where unsalvaged and unprotected topsoil/root zone material is present in order to avoid rutting and subsequent topsoil/root zone material and spoil admixing.
<i>Hotline Exposure/Hydrovac</i>	<ol style="list-style-type: none"> 2. Ensure that all hydrovac tanks are clean and free of contaminants prior to use on-site. 3. Empty clean hydrovac material onto subsoil at sites approved by an Environmental Inspector. Ensure that hydrovac material will not migrate to a watercourse or wetland, or onto topsoil/root zone material). 4. Backfill and compact all hydrovac holes during rough clean-up with native, loose, dry material to ensure that settling of material does not pose a hazard for wildlife or livestock. 5. Implement measures in the Contaminated Sites Discovery Contingency Plan (Appendix B of this EPP) if potential contamination of hydrovac materials is encountered or suspected. 6. Refer to the Hydrovac Cutting and Disposal Management Plan (Section 3.0 of Volume 6 of the Environmental Plans) for additional mitigation measures to be implemented during hydrovac activities.
<i>Excavation</i>	<ol style="list-style-type: none"> 7. Where groundwater and/or soil contamination is suspected, implement the Contaminated Sites Discovery Contingency Plan (Appendix B of this EPP). Refer to the Contamination Identification and Assessment Plan provided in Section 3.0 of Volume 6 of the Environmental Plans for areas of known contamination encountered by the Project. 8. Limit the duration of time that the excavations will be left open to reduce the potential for sloughing. 9. Ensure that contaminated soil and water, if present, are not transported off-site or disposed until analytical results have been received, as per federal and provincial regulations and legislation as determined by the Contaminated Sites Resource Specialist. 10. Develop a plan for disposal of rock for approval by the Environmental Inspector and implement the plan during construction.

Concern/Activity	Mitigation Measures
<i>Temporary Soil Stockpile Locations</i>	<ol style="list-style-type: none">11. Locate and clearly mark temporary soil storage piles away from grade and spoil materials, construction activities and day-to-day operations, as approved by an Environmental Inspector. Ensure that temporary soil storage piles are accessible and available for hauling.12. Locate the soil stockpile sites in upslope positions to avoid disruption of drainage and drainage channels. Ensure that drainage through low areas associated with spring breakup will not impact soil piles.
<i>Dewatering</i>	<ol style="list-style-type: none">13. Assess the need for well points or other dewatering methods, prior to commencing excavations, to intercept groundwater at site-specific locations.14. Delay excavations until immediately prior to construction works at locations with a high-water table or where there is a risk of sloughing.15. Dewater the excavation sites, if warranted. Place pumps on a tray or within an excavated sump lined with polyethylene sheeting. Pump water onto stable and well-vegetated areas, tarpaulins or sheeting in a manner that does not cause erosion or sediment-laden water to re-enter a watercourse or wetland. Dewater the excavation sites if existing or anticipated (based on precipitation forecasts) water levels in the excavation could overwhelm existing water control measures.16. Use floating suction hose and elevated intake, or other measures approved by an Environmental Inspector, to prevent soil material from being sucked from the bottom of the excavation.17. Monitor the water discharge site to ensure that erosion, saturation of the discharge site or flooding does not occur. Ensure that water does not flow off the property, unless proper authorizations are in place from the Appropriate Government Authority. Suspend dewatering and either apply erosion control measures, reduce the flow or move the discharge site if it appears that the above effects could occur.
<i>Gravel</i>	<ol style="list-style-type: none">18. In areas where a gravel pad will be established (<i>i.e.</i>, where infrastructure will be installed and in areas that will be subject to travel during the operations phase of the Project), grade the gravel pad in such a manner as to ensure that the pad does not interfere with the local surface drainage pattern.
<i>Bird Deterrents</i>	<ol style="list-style-type: none">19. Install guards and/or wildlife protectors, where warranted (<i>e.g.</i>, electrical substations), at the facility to reduce the risk of avian nesting.20. Nest deterrents will be installed outside the primary nesting period (which is March 26 to August 16) for migratory birds (ECCC, 2017), and may include visual, physical (<i>e.g.</i>, guards or protectors) or energized deterrents depending on the type of infrastructure.

8.0 MARINE CONSTRUCTION

Introduction

The following mitigation measures are applicable to the construction of marine components of the WMT throughout all phases of construction by Trans Mountain, its Contractor and subcontractors.

Objective

The objective of the following mitigation measures is to avoid or reduce potential adverse environmental effects associated with the marine component of the WMT construction activities including: in-water excavation of existing rip rap; installation of circular sheet pile walls associated with the foreshore extension; installation of cylindrical pipe piles for the marine trestle and berths; and overwater construction of dock infrastructure.

General Marine Measures

General marine environmental protection specifications are to be implemented along with the general measures (onshore and marine) outlined in Section 6.0 of this EPP.

Activity/Concern	Mitigation Measures
<i>Permits and Approvals</i>	<ol style="list-style-type: none"> 1. Review notification requirements identified in Section 5.0 of this EPP and ensure that notifications have been completed. 2. Ensure that a <i>Fisheries Act</i> Authorization (Section 35 [2]) is obtained from DFO for all activities that are likely to result in residual serious harm to fish, prior to the commencement of marine construction.
<i>Marine Species at Risk or Species of Concern</i>	<ol style="list-style-type: none"> 3. Ensure that all mitigation measures associated with onshore and marine wildlife species at risk and species of concern are communicated to Project personnel.
<i>Public Marine Access</i>	<ol style="list-style-type: none"> 4. Discourage unauthorized marine vessels in the WMT construction area by demarcating it and by use of signs, markers and/or buoys. Refer to the Navigation and Navigation Safety Plan (Section 8.0 of Volume 6 of the Environmental Plans) for more information. Install a marine safety boom around the WMT construction zone, if approved by the VFPA.
<i>Permit Conditions</i>	<ol style="list-style-type: none"> 5. Ensure all conditions outlined in authorizations and/or permits and approvals are adhered to during marine construction.
<i>Schedule</i>	<ol style="list-style-type: none"> 6. Schedule work for daylight hours, where feasible. Refer to mitigation for lighting and noise emissions provided in Section 6.0 of the EPP in the event that construction activities must be undertaken during the night. Written authorization from the VFPA will be required for any work outside the approved Westridge Marine Terminal construction hours. 7. Conduct in-water excavation of rip rap between August 16 and March 15. 8. Install portions of the circular sheet pile wall in contact with the marine environment between August 16 and March 15. 9. Install circular sheet pile walls associated with the marine trestle, loading platforms, berthing dolphins and mooring dolphins year-round following the mitigation measures outlined in the <i>Fisheries Act</i> Authorization (Section 35[2]). .

Activity/Concern	Mitigation Measures
<i>Access</i>	<ol style="list-style-type: none">10. For access to the marine construction area with the Contractor's registered marine vessels, ensure the vessels are approved for the Project, inspected and certified fit for use by the Contractor or their designate.11. Identify terrestrial access routes to the marine construction footprint from designated staging and/or laydown areas.12. Maintain a list of personnel and vessels eligible to access the marine construction site.13. Use existing roads for access to the WMT construction footprint. If additional temporary access roads are required at or near the shoreline, they will be constructed of granular fill over a geotextile and removed after construction is completed. Discuss access road siting and mitigation requirements (e.g., sediment fencing) with an Environmental Inspector.
<i>Recreational Activities</i>	<ol style="list-style-type: none">14. Prohibit marine recreational activities (e.g., boating, fishing, swimming and diving) by Project personnel on or in the vicinity of the WMT.
<i>Construction Vessel Traffic</i>	<ol style="list-style-type: none">15. Ensure that Project vessels are equipped with a high-frequency radio with appropriate channels to monitor vessel traffic in the Project area.16. Ensure that construction vessel traffic is confined to the general work site, where feasible, and that vessel anchoring or other disturbance only occurs in Trans Mountain approved locations, unless required in an emergency situation.17. Ensure that pile hammers and backhoes working in water utilize vegetable-based hydraulic fluids and lubricants during this work, if practical.18. Operate Project-related vessels at slow speeds (< 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.19. Inform Project-related vessel operators of the potential for birds to collide with vessel structures at night due to deck lighting or inclement weather, and for vessels to collide with marine mammals. Report all bird, mammal and structure strikes/collisions immediately to the Chief Activity Inspector and/or the Environmental Inspector.
<i>Noise</i>	<ol style="list-style-type: none">20. Maintain Project-related vessels to reduce acoustic emissions (both above and below the water surface).
<i>Waste Disposal</i>	<ol style="list-style-type: none">21. Manage all marine-related solid and liquid waste in accordance with the <i>Canadian Shipping Act</i>.22. Ensure that solid materials, including construction materials, will not be discharged into the marine environment at any time.23. Conduct a site clean-up at the end of each day to prevent accumulation of waste materials.24. Keep vessel and dock surfaces free of construction materials (e.g., concrete fines) to prevent their entry into the marine environment.

Activity/Concern	Mitigation Measures
<i>Marine Sedimentation</i>	<p>25. Use only clean (washed, free of mud or other fines) rock for construction of fish habitat offsets (<i>i.e.</i>, rock reefs) and conduct work between August 16 and March 15. Ensure that a turbidity curtain is installed around the area where rip rap will be placed, to contain any suspended sediment.</p> <p>26. Reduce the risk of sedimentation from upland areas into the marine environment by properly installing appropriate terrestrial erosion and sediment control measures (refer to erosion and sedimentation mitigation provided in Section 7.1 of this EPP).</p>
<i>In-water Excavation</i>	<p>27. Conduct in-water excavation of rock rip rap in accordance with applicable permits and/or approvals and between August 16 and March 15.</p> <p>28. Install a turbidity curtain during in-water excavation of rock rip rap to contain suspended sediment to the work area (see Drawing 2 [Turbidity Curtain Installation {Tidal Conditions}] provided in Appendix C of this EPP).</p> <p>29. During in-water excavation or rip rap, conduct water quality monitoring (WQM) as per the Water Quality Management Plan during Rip Rap Removal (Appendix H of this EPP). Conduct WQM to assess the effectiveness of the turbidity curtain and modify turbidity curtain deployment, if required.</p> <p>30. Unless otherwise approved by DFO, retain all excavated material and dispose at a land-based facility in accordance with applicable regulations</p> <p>31. Adhere to measures outlined in Section 6.0 and the Heritage Resources Discovery Contingency Plan (see Appendix B of this EPP) for historical, archaeological resources, if historical artifacts or remains are discovered during in-water excavation activities.</p>
<i>Pile Installation</i>	<p>32. Conduct pile installation activities in accordance with all applicable permits and/or approvals.</p> <p>33. Conduct in-water impact-hammer pile driving during daylight hours only.</p> <p>34. 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.</p> <p>35. Immediately following the installation of each sheet pile cell, and prior to excavation and infilling of that cell, conduct a salvage of commercial, recreational and Aboriginal (CRA) fishery species via crab and fish trapping/netting and seines (where appropriate). Release captured CRA fishery species in a suitable habitat at least 500 m away from marine construction activities.</p> <p>36. Where an impact hammer is required for pile installation, deploy a bubble curtain around the full wetted length of the pile (see Drawing 3 [Air/Bubble Curtain Installation {Pile Installation}] provided in Appendix C of this EPP) to reduce underwater noise and pressure levels.</p> <p>37. 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.</p> <p>38. In-water pile installation within a 50-metre horizontal distance of the high water large tide level will be limited to a timing window between August 16 and March 15.</p>

Activity/Concern	Mitigation Measures
<i>Pile Installation (cont'd)</i>	<p>39. Monitor underwater noise and pressure levels outside of the bubble curtain, within 10 meters of the driven pile, throughout impact pile driving. If monitoring indicates an exceedance of kPa dB re Pa peak during the DFO least risk window for Burrard Inlet (August 16 to February 28) or kPa dB re 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.</p> <p>40. 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.</p> <p>41. 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.</p> <p>42. 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.</p> <p>43. Should visual monitoring during in-water pile installation indicate concern regarding turbidity levels, the Environmental Inspector will arrange for in situ sampling of turbidity (nephelometric turbidity units). Should turbidity levels exceed specified thresholds, pile driving will temporarily be halted.</p>
<i>Marine Drilling</i>	<p>44. Conduct marine drilling activities in accordance with applicable permits and/or approvals.</p> <p>45. If drilling of internal pile anchors is required, contain drill cuttings and drill muds and dispose at a land based facility in accordance with applicable regulations.</p>
<i>Cleaning Out Pipe Piles</i>	<p>46. If steel pipe piles that are driven open ended are to be cleaned out, contain all sediment and dispose at a land-based facility in accordance with applicable regulations.</p>

Activity/Concern	Mitigation Measures
Concrete Management	<ol style="list-style-type: none"><li data-bbox="467 264 1117 291">47. Isolate concrete work from the marine environment.<li data-bbox="467 310 1433 394">48. Wash all tools, pumps, pipes, hoses and trucks used for finishing, placing or transporting fresh concrete in designated areas, away from the marine environment.<li data-bbox="467 415 1433 541">49. Avoid depositing, directly or indirectly, any concrete, mortars or other lime-containing construction materials into or near the marine environment. All forms, if applicable, shall be examined by qualified Inspector(s) prior to pour to ensure they are tight.<li data-bbox="467 562 1433 709">50. Ensure that properly sealed chutes are present to avoid spillage, if concrete is discharged or placed directly into the formwork. If the concrete is being placed in the formwork with a concrete pump, properly seal and lock all hose and pipe connections to ensure that the lines will not leak or uncouple. Do not overfill concrete forms.<li data-bbox="467 730 1433 856">51. Maintain complete isolation of cast-in-place concrete and grouting from the marine environment for a minimum of 48 hours if the ambient air temperature is above 0°C and for a minimum of 72 hours if the ambient air temperature is below 0°C.<li data-bbox="467 877 1433 982">52. Ensure that all concrete work is completed during dry conditions and properly contained within formwork, such that no concrete products enter the surrounding marine environment. Concrete must be set before a change in tidal conditions results in coverage.<li data-bbox="467 1003 1433 1066">53. Use anti-washout admixtures in any concrete or cement grout that must be placed underwater.<li data-bbox="467 1087 1433 1486">54. Collect all stormwater, surface water runoff and wash water generated from construction activities that contains or may contain suspended concrete materials and/or particles. Monitor pH as per the <i>Canadian Water Quality Guidelines for the Protection of Aquatic Life</i>. If the pH of the water is above acceptable levels, it may be adjusted in the water treatment unit. Ensure that pH and turbidity levels in the marine environment are monitored when dust or fines from grinding incompletely cured concrete enter the water column. In the event that levels exceed the acceptable water quality guidelines (<i>i.e.</i>, <i>Canadian Water Quality Guidelines for the Protection of Aquatic Life</i>), introduce preventative measures (<i>i.e.</i>, implementation of turbidity curtains to contain the suspended solids and prevent marine mammals or fish from entering the area) (see Drawing 2 [Turbidity Curtain Installation {Tidal Conditions}] in Appendix C of this EPP).<li data-bbox="467 1507 1433 1717">55. Utilize industry-accepted construction practices for placing concrete over water and take all reasonable precautions to contain and neutralize spills in the event that concrete material is released into the marine environment. Report any spill to the Senior Compliance Advisor who will report to the appropriate regulatory authorities. Conduct ongoing monitoring of pH and turbidity during and following clean-up of the spill and compare to confirm that water quality guidelines for pH and turbidity are reached and maintained.<li data-bbox="467 1738 1433 1801">56. Implement the Marine Spill Contingency Plan (see Appendix B of this EPP), in the event of a concrete fines spill or material release.<li data-bbox="467 1822 1433 1848">57. Remove all concrete and affiliated equipment or materials upon completion of concrete works.

Activity/Concern	Mitigation Measures
<i>Marine Mammals</i>	<p>58. Discuss marine mammal issues that are identified during construction, with the Environmental Inspector, the Marine Resource Specialist and the appropriate regulatory authorities.</p> <p>59. Implement all marine mammal-specific mitigation measures outlined under relevant activities (e.g., impact pile installation above).</p> <p>60. Implement the Onshore or Marine Wildlife Species of Concern Discovery Contingency Plan (see Appendix B of this EPP), in the event of encountering a marine mammal species at risk or species of concern.</p> <p>61. Implement any relevant measures in the Marine Mammal Protection Program, developed pursuant to NEB Condition 132, which will focus on effects from the operations of Project-related marine vessels. Note that the draft Marine Mammal Protection Program will be developed 3 months prior to the start of pile installation, but will be a living document and, therefore, may go through multiple iterations over the life of the Project as the various programs develop over time.</p>
<i>Marine Fish and Fish Habitat</i>	<p>62. 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.</p> <p>63. Ensure that barges are anchored or spudded in appropriate areas with minimal effects to intertidal and subtidal marine habitats. Grounding is prohibited, unless authorized by VFPA. Avoid sensitive marine habitats, where feasible.</p> <p>64. 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.</p>
<i>Marine Species at Risk and Species of Concern</i>	<p>65. Report sightings of species at risk or species of concern immediately to the Environmental Inspector. Implement the Onshore or Marine Wildlife Species of Concern Discovery Contingency Plan (see Appendix B of this EPP), as appropriate. The Environmental Inspector will record the location in the daily reports.</p>
<i>Invasive Marine Species</i>	<p>66. Ensure that all Project-related vessels follow the requirements for ballast water management, as outlined in the <i>Canadian Shipping Act (c.26)</i> and the <i>Canadian Ballast Water Control and Management Regulations (SOR/2011-237)</i>, to reduce the risk of importing invasive marine species into the WMT area.</p>

9.0 CLEAN-UP AND RECLAMATION

Introduction

Clean-up and reclamation are important steps in returning the WMT construction site to a condition suitable for operational requirements.

The objectives of clean-up and reclamation mitigation measures at facilities are to:

- effectively use reclamation techniques that prevent topsoil/root zone material loss from wind and water erosion;
- establish a vegetative cover compatible with surrounding vegetation and land uses, where applicable;
- comply with approval conditions, including permits and commitments; and
- re-establish the construction sites to a stable condition.

The following mitigation measures may be implemented, as necessary, by Trans Mountain, its contractors and/or subcontractors during clean-up and reclamation activities.

Activity/Concern	Mitigation Measures
<i>Scheduling</i>	<ol style="list-style-type: none"> 1. Follow activity restriction guidelines and road bans, and consider spring melt when scheduling clean-up and reclamation activities. 2. Commence clean-up activities as soon as practical following construction. 3. Reclaim disturbed lands within one growing season following construction, if feasible. 4. Determine the appropriate schedule for seeding and for planting of seedlings or trees and shrubs, where applicable.
<i>Recontouring</i>	<ol style="list-style-type: none"> 5. Recontour disturbed lands to stable profiles and to meet operational requirements.
<i>Erosion Control</i>	<ol style="list-style-type: none"> 6. Implement appropriate erosion control measures (e.g., soil compaction, soil covers, seeding, mulch and/or tackifiers) to stabilize soil berms, grade cuts, fills and other disturbed lands in accordance with the ESC, as warranted. 7. Establish long-term topsoil/root zone material storage berms at locations away from regular facility operations and areas with potential for overland water flow.
<i>Drainage</i>	<ol style="list-style-type: none"> 8. Ensure that ditches and culverts are in place and free of obstructions to facilitate site drainage.
<i>Topsoil/Root Zone Material Replacement</i>	<ol style="list-style-type: none"> 9. Replace topsoil/root zone material evenly over disturbed land surfaces where reclamation will occur.
<i>Equipment/Vehicle Travel</i>	<ol style="list-style-type: none"> 10. Limit equipment/vehicle travel over surfaces where topsoil/root zone material has been replaced.
<i>Garbage and Debris</i>	<ol style="list-style-type: none"> 11. Remove all garbage and debris from the facility construction site. 12. Conduct an underwater survey to identify the presence of construction debris. Immediately remove underwater debris, if present.
<i>Seeding</i>	<ol style="list-style-type: none"> 13. Seed disturbed lands as soon as practical following replacement of topsoil/root zone material. See recommended seed mixes for facilities by location in Appendix D of this EPP.

Activity/Concern	Mitigation Measures
<i>Seed Quality</i>	14. Use only Canada Certified No. 1 or best available agronomic seed. Do not use seed that contains Prohibited Noxious or Noxious weeds. Retain the Certificate of Analysis documentation for facility site records.
<i>Visual Barriers</i>	15. Where considered warranted, install tree and/or shrub plantings around identified building structures or fence perimeters to provide a visual screen (see example in Detail 5 provided in Appendix C of this EPP and additional information in the Reclamation Management Plan, Section 9.0 of Volume 6 of the Environmental Plans). Avoid using forage species for visual screens in unsecured areas that will attract ungulates.
<i>Fences</i>	16. Repair existing and/or install new permanent fencing and gates about the facility site to secure the area to operational requirements.
<i>Weed Control</i>	17. Maintain weed control during clean-up and reclamation activities.
<i>Equipment</i>	18. Remove all Project equipment and materials from marine areas that will not be utilized during operations of the WMT.

10.0 WESTRIDGE MARINE TERMINAL FACILITY TESTING

Introduction

Prior to the operation of the WMT expansion, systems will require a hydrostatic test, which is then followed by dry (no oil present) and wet (oil present) commissioning to facilitate final testing and calibration of facility components. The following mitigation measures will be implemented, as necessary, during hydrostatic testing where water will be used for pressure testing of terminal piping. Water will be obtained from the City of Burnaby. Trans Mountain will work with the City of Burnaby to demonstrate filing conformance. The Hydrostatic Testing Plan will be filed with the NEB pursuant to NEB Conditions 112 and 113, respectively.

Objectives

The objectives of these mitigation measures are to:

- ensure hydrostatic pressure testing activities are conducted in accordance with all approval conditions and permits; and
- reduce or avoid effects on the marine environment waterbodies used during hydrostatic testing of WMT piping and facility components.

Activity/Concern	Mitigation Measures
<i>Approvals, Authorizations, Licences and Permits</i>	<ol style="list-style-type: none"> 1. Conduct hydrostatic testing activities in accordance with the Hydrostatic Testing Plan filed with the NEB pursuant to NEB Conditions 112 and 113, respectively. Ensure that hydrostatic testing is conducted in accordance with applicable permit requirements and that all necessary approvals are obtained prior to commencing hydrostatic testing activities. Refer to permitting and notification requirements provided in Section 5.0 of this EPP. 2. Retain records (including dates) of all key hydrostatic testing activities (e.g., water withdrawal location, rates and volumes, sampling results, discharge locations, rates and volumes).
<i>Water Additives</i>	<ol style="list-style-type: none"> 3. Review potential issues associated with the testing program, including water quality and, if appropriate, identify any chemical additives (including Material Safety Data Sheets) to be used during the testing program. Obtain approval from the Environmental Inspector, if required, for the use of the additives.
<i>Discharge</i>	<ol style="list-style-type: none"> 4. Ensure that the appropriate testing and treatment measures are implemented in accordance with the BC <i>Waste Discharge Regulation</i>, BC Reg. 320/2004.
<i>Sampling</i>	<ol style="list-style-type: none"> 5. Conduct sampling of soils at discharge sites (e.g., soils and water), receiving test water, if warranted, to abide by requirements related to test water discharge and any other application/approval requirements.
<i>Hydrostatic Test Plan</i>	<ol style="list-style-type: none"> 6. Notify the Construction Manager or designate and an Environmental Inspector a minimum of 72 hours prior to commencing water withdrawal and test water discharge activities. 7. Adhere to the applicable measures outlined in the Hydrostatic Testing Plan that is filed at least 90 days prior to pressure testing any Project component as per NEB Conditions 112 and 113.
<i>Equipment and Workers</i>	<ol style="list-style-type: none"> 8. Ensure that sufficient workers and equipment are available on-site to repair any rupture, leak or erosion problem that might arise during testing.
<i>Water Trucks</i>	<ol style="list-style-type: none"> 9. Ensure that water hauling trucks for test water are clean and inspected prior to use.

Activity/Concern	Mitigation Measures
<i>Withdrawal</i>	10. Work with the City of Burnaby to demonstrate filing conformance prior to withdrawing water for hydrostatic testing.
<i>Dewatering</i>	11. Follow all dewatering measures outlined in the Hydrostatic Test Plan and the Water Withdrawal and Discharge Procedures Management Plan (see Section 8.0 of Volume 6 of the Environmental Plans). 12. Monitor discharge locations to ensure that no erosion or flooding occurs. If conditions become saturated to the extent that adequate natural filtration is no longer occurring, suspend dewatering and move the discharge to another approved location (confirm that appropriate approvals and, if warranted, soil testing have been completed) or construct a holding pond for the water and release the water when natural filtration is feasible. 13. Ensure the areas that are to receive discharged water are approved by an Environmental Inspector in accordance with the Appropriate Government Authority guidance. 14. Conduct testing of the test water and soils at the discharge site in accordance with applicable federal and provincial requirements. 15. Dewater onto areas approved by the Environmental Inspector where water will be filtered through vegetation and soils before returning to a watercourse, wetland or lake. Provide scour protection (<i>e.g.</i> , use of rock aprons, plastic sheeting, plywood and straw bales) or an energy diffuser (<i>e.g.</i> , dissipater and protective rock, marine water quality management during rip rap removal, sheeting, tarpaulins or other equivalent materials) at the discharge site, as approved by the Environmental Inspector. The rate of discharge will be reduced if these measures are ineffective.
<i>Sample Collection</i>	16. Collect samples of source water, hydrostatic test water and soil of the receiving environment prior to discharge and analyze according to the parameters listed in the Water Withdrawal and Discharge Procedures Management Plan (see Section 8.0 in Volume 6).
<i>Pigging Debris</i>	17. Collect pigging debris and dispose of it at an acceptable location (<i>e.g.</i> , an approved landfill). Dispose of remaining construction waste in accordance with the Appropriate Government Authority.
<i>Daylighting</i>	18. Follow applicable EPP protection measures if exposure (daylighting) of below-grade sections of facility piping is necessary for inspection or repairs.

11.0 REFERENCES

11.1 Literature Cited

- British Columbia Ministry of Environment. 2004. *Waste Discharge Regulation* B.C. Reg. 320/2004. Website: http://www.bclaws.ca/Recon/document/ID/freeside/50_320_2004. Accessed: November 2016.
- British Columbia Oil and Gas Commission. 2009. British Columbia Noise Control Best Practices Guideline. Website: <http://www.bcogc.ca/node/8152/download>. Accessed: November 2016.
- Canadian Standards Association. 2015. CSA Z662-15 Oil and Gas Pipeline Systems. Mississauga, ON.
- Health Canada. 2015. Workplace Hazardous Materials Information System. Website: <http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index-eng.php>. Accessed: November 2016.
- Environment and Climate Change Canada. 2017. General Nesting Periods of Migratory Birds in Canada. Website: <https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1>. Accessed: May 2017.
- Fisheries and Oceans Canada (DFO). 2016. Golden Star Tunicate: *Botryllus schlosseri*. Available at: <http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/species/golden-star-tunicate-eng.html>. Accessed: May 2017.
- Kinder Morgan Canada Inc. 2017. *Environment, Health and Safety Policy*. Calgary, AB. 1 pp.
- National Energy Board. 2011. National Energy Board Remediation Process Guide. Website: <https://www.neb-one.gc.ca/sftnvrnmnt/nvrnmnt/rmdtnprcssgd/rmdtnprcssgd-eng.pdf>. Accessed: November 2016.
- Transport Canada. 2009. Water Intakes Brochure. Website: <http://www.tc.gc.ca/publications/bil/tp14591/pdf/hr/tp14591b.pdf>. Accessed: November 2016.

11.2 GIS Data and Mapping References

This subsection includes references cited on the figures accompanying this report.

- Alberta Tourism, Parks and Recreation. 2012. Protected Areas (pashape_ocsites_10tm) (digital file). Edmonton, AB. Available: <http://albertaparks.ca/albertaparksca/library/downloadable-data-sets.aspx>. Acquired: February 2013. Last Update Check: August 11, 2015.
- AltaLIS. 2010. Alberta Settlements (digital file). Calgary, AB. Available: http://www.altalis.com/products/base/20k_base_features.html. Acquired: February 2011. Last Update Check: September 17, 2014.
- AltaLIS. 2012. Alberta Provincial Parks (digital file). Calgary, AB. Available: http://www.altalis.com/products/base/20k_base_features.html. Acquired: August 2012. Last Update Check: September 17, 2014.
- AltaLIS. 2016. Alberta Municipal Boundaries (digital file). Calgary, AB. Available: <http://www.altalis.com>. Acquired: January 2016. Last Update Check: January 4, 2016.
- BC Forests, Lands and Natural Resource Operations. 2008. Freshwater Atlas Lakes (digital file). Victoria, BC. Available: <https://apps.gov.bc.ca/pub/dwds/home.so>. Acquired: August 2011. Last Update Check: July 15, 2014.
- BC Ministry of Forests, Lands and Natural Resource Operations. 2007. Tantalus Municipalities (digital file). Victoria, BC. Available: <https://apps.gov.bc.ca/pub/dwds/home.so>. Acquired: May 2013. Last Update Check: November 20, 2014.

- BC Ministry of Forests, Lands and Natural Resource Operations. 2008. Tantalus Conservancy Areas (digital file). Victoria, BC. Available: <https://apps.gov.bc.ca/pub/dwds/home.so>. Acquired: September 2014. Last Update Check: November 20, 2014.
- BC Ministry of Forests, Lands and Natural Resource Operations. 2012. Digital Road Atlas (DRA) - Master Partially Attributed Road Data (digital file). Victoria, BC. Available: <https://apps.gov.bc.ca/pub/dwds/home.so>. Acquired: December 2015. Last Update Check: December 15, 2015.
- CH2M HILL Energy Canada, Ltd. 2015. Raptor Nests for EFDs (digital file). Calgary, AB. Mapped May 21, 2015.
- ESRI. 2005. U.S. State Boundaries (digital data). Redlands, CA. Received: via DVD with ArcGIS software, visit <http://www.esri.com/data/data-maps> for more info. Acquired: September 2006. Last update check: N/A.
- Government of Canada. 2016. Aboriginal Lands, Canada (digital file). Edmonton, AB. Available: <http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/815dd99d-4fbd-47cc-be02-7ad4b03a23ec.html>. Acquired: January 2016. Last Update Check: January 11, 2016.
- IHS Inc. 2004. IHS Hydro Line Data (digital file). Calgary, AB. Received: via DVD, visit <http://www.ihs.com> for more info. Acquired: June 2011. Last Update Check: November 16, 2015.
- IHS Inc. 2004. IHS Hydro Region Data (digital file). Calgary, AB. Received: via DVD, visit <http://www.ihs.com> for more info. Acquired: June 2011. Last Update Check: November 16, 2015.
- IHS Inc. 2016. IHS Road Segments (digital file). Calgary, AB. Received: via DVD, visit <http://www.ihs.com> for more info. Acquired: April 13, 2016. Update Interval: Monthly.
- Kinder Morgan Canada. 2012. Existing Trans Mountain Pipeline (TMPL) and TMPL Kilometre Post (digital files). Calgary, AB. Received via FTP. Acquired: May 9, 2012. Last Update Check: N/A.
- Kinder Morgan Canada. 2016. Facility Points (digital file). Calgary, AB. Received via FTP. Acquired: December 2, 2016. Last Update Check: N/A.
- Kinder Morgan Canada. 2016. Orthorectified Imagery (digital file). Calgary, AB. Received via FTP. Acquired: August 16, 2016. Last Update Check: N/A.
- Kinder Morgan Canada. 2016. Facility Fencelines (digital file). Calgary, AB. Received via FTP. Acquired: August 23, 2016. Last Update Check: N/A.
- Kinder Morgan Canada. 2016. Facility Footprints (digital file). Calgary, AB. Received via FTP. Acquired: December 2, 2016. Last Update Check: N/A.
- Kinder Morgan Canada. 2016. Project Sanctioned Access Roads (digital file). Calgary, AB. Received via FTP. Acquired: June 6, 2016. Last Update Check: N/A.
- Natural Resources Canada. 2003. Canadian Geographical Names (digital file). Ottawa, ON. Available: <http://geobase.ca/geobase/en/data/cgn/index.html>. Acquired: December 2011. Last Update Check: December 2011.
- Natural Resources Canada. 2010. North American Atlas – Hydrography (digital file). Ottawa, ON. Available: <http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/4a778c9f-00b1-5fce-aa2f-42a90d19eb24.html>. Acquired: June 2012. Last Update Check: January 6, 2015.
- Natural Resources Canada. 2012. CanVec -Transportation - 1020009 Railway (digital file). Sherbrooke, QC. Available: <http://geogratis.cgdi.gc.ca/geogratis/en/download/topographic.html>. Acquired: June 2012. Last Update Check: November 2012.

Natural Resources Canada. 2016. Canada Lands Administrative Boundaries Level 1 (digital file). Ottawa, ON. Available: <http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/eb3757cc-d08b-5e62-9a44-3a8534ff3249.html>. Acquired: January 2016. Last Update Check: January 8, 2016.

TERA Environmental Consultants. 2008. Hillshade. Derived from Natural Resources Canada, Earth Sciences Sector, Centre for Topographic Information. 2000-2008. Canadian Digital Elevation Data 250k (digital files). Sherbrooke, QC. Available: <http://www.geobase.ca/geobase/en/data/cded/index.html>. Acquired: 2008. Last Update Check: December 2010.

TERA Environmental Consultants. 2010. PNG Grid (digital files). Calgary, AB.

UPI. 2017. Proposed KPs, Centerline SSEID005 (digital files). Calgary, AB. Received via FTP. Acquired: January 10, 2017. Data Current to: January 10, 2017.

APPENDIX A
CONTACTS

TABLE A-1
EMERGENCY CONTACTS

Contact	Location	Phone Number
Emergency Assistance	Province-wide	9-1-1
Royal Canadian Mounted Police	Burnaby	1-604-294-7922
Emergency Medical Services (Ambulance)	Dispatch Cell/SAT Phone	1-800-461-9911 1-250-374-5937
Hospital/Clinic	Burnaby Hospital (Burnaby)	1-604-434-4211
Fire	Non-Emergency Burnaby	1-604-294-7190
BC MOE 24-hour Spill Line	BC	1-800-663-3456
NEB	Pipeline Emergency Other NEB operations-related emergencies Vancouver Office	1-819-997-7887 1-403-807-9473 1-604-666-3975
DFO Observe, Record and Report Hotline	BC	1-800-465-4336
Transportation Safety Board	Canada-wide	1-800-387-3557
Conservation Officer Service	BC	1-877-952-7277
BC One-Call	BC	1-800-474-6886
Western Canadian Spill Services Oil Spill Co-operative – 24-Hr Emergency	BC	1-866-541-8888
Forest Fires	BC Forest Fires Reporting Centre	1-800-663-5555
Trans Mountain – Environment, Health and Safety	Burnaby	1-604-268-3008
Trans Mountain Operations Supervisor	Burnaby	1-604-268-3040
Trans Mountain – 24-hour Emergency Line	BC	1-888-876-6711
Vancouver Traffic VHF	BC	Channels 12/11/74/16

APPENDIX B
CONTINGENCY PLANS

TABLE OF CONTENTS

	<u>Page</u>
1.0	CONTAMINATION DISCOVERY CONTINGENCY PLANB-3
1.1	Pre-Job Planning.....B-3
2.0	FIRE CONTINGENCY PLAN.....B-6
3.0	HERITAGE RESOURCES DISCOVERY CONTINGENCY PLANB-7
4.0	MARINE SPILL CONTINGENCY PLANB-8
4.1	IntroductionB-8
4.2	Response OrganizationB-8
5.0	RARE ECOLOGICAL COMMUNITIES OR RARE PLANT SPECIES DISCOVERY CONTINGENCY PLANB-10
6.0	SOIL EROSION AND SEDIMENT CONTROL CONTINGENCY PLANB-11
7.0	SPILL CONTINGENCY PLANB-13
7.1	IntroductionB-13
7.2	General Measures.....B-14
7.3	Initial Response.....B-14
7.4	General Spill Containment Procedures.....B-15
7.4.1	Spot SpillsB-15
7.4.2	Spills Occurring During On-site TransportationB-16
7.4.3	Spills Adjacent to or into a Watercourse or WetlandB-16
8.0	WET SOILS CONTINGENCY PLANB-17
9.0	WILDLIFE SPECIES OF CONCERN DISCOVERY AND ENCOUNTER CONTINGENCY PLAN.....B-19
9.1	Terrestrial or Marine Wildlife Species of ConcernB-19
9.1.1	Wildlife Encounter Contingency Plan.....B-20
10.0	TRADITIONAL LAND USE SITES DISCOVERY CONTINGENCY PLANB-23
10.1	Traditional Land Use Sites Identified Prior to ConstructionB-23
10.2	Traditional Land Use Sites Discovered During Construction.....B-25

LIST OF ATTACHMENTS

Attachment B1	Spill Scene Checklist.....B1-1
---------------	--------------------------------

LIST OF TABLES

Table B-1	Criteria for the Suspension of Activities due to Excessively Wet Soil Conditions Outside of the Development ZoneB-18
-----------	---

1.0 CONTAMINATION DISCOVERY CONTINGENCY PLAN

1.1 Pre-Job Planning

A list of areas with moderate to high potential risk for contamination is provided in the Contamination Identification and Assessment Plan (Section 3.2 of Volume 6 of the Environmental Plans). In accordance with the Contamination Identification and Assessment Plan, a Contamination Resource Specialist will ensure the appropriate response and mitigation is carried out during construction in the identified high-risk areas. When working in areas of moderate risk, the Environmental Inspector will ensure workers are aware of the potential to encounter contamination. If unexpected contamination is encountered, this Contamination Discovery Contingency Plan will be initiated.

Recognition and Response

Identification of Contamination

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

- unusual, hydrocarbon or chemical odour;
- visual sheen;
- visual free product (oil or other product);
- visual staining;
- high soil vapour concentrations; and/or
- asbestos or asbestos containing material (ACM) (>1% by weight of asbestos fibres and powder/dust or friable).

Contamination will be identified by way of visual field observation and field screening. Visual field indicators to identify asbestos include: serpentine rock, fibrous appearance, greasy luster; for ACMs: brake pads, cement piping, vinyl tiles, home insulation, cement siding); and for asbestos deposit areas: former landfills, asbestos dumps including other signs of waste deposition (*e.g.*, fill, liners, surficial evidence). The microPHAZIR™, which is owned by ThermoFisher Scientific, is the tool for field screening when excavation during construction is performed and the presence of asbestos or ACMs is suspected.

The microPHAZIR™ is a handheld portable analyzer that has been demonstrated to provide non-destructive screening of six types of asbestos fibres (*i.e.*, Chrysotile, Anthophyllite, Tremolite, Actinolite, Amosite/Crocidolite) via infrared analyses. ThermoFisher Scientific demonstrated the microPHAZIR™ detection limits are for concentrations greater than 1% asbestos fibres determined by analyzing asbestos reference standards with known concentrations.

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 National Energy Board (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 to assist in monitoring and mitigation.

Signage will be posted in areas with moderate to high potential risk for contamination to alert workers of the increased risk.

The Land Agents and/or Lands Group, Stakeholder Engagement and Communication Team, and the Aboriginal Engagement Team will also determine the requirement for notification of affected landowners and/or occupants, Aboriginal groups, and other municipal or regional agencies and will coordinate these notifications, as required.

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 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 the Construction Health and Safety Management Plan as well as any other measures or requirements.

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 the following:

- 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.
- If sampling is required, laboratory analytical parameters for soil and groundwater are to 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).
- Signage will be posted in the area of suspected contamination to alert workers of the increased risk.
- Mitigation measures will be implemented as soon as possible following the discovery of contamination. The Implementation of mitigation measures will be based on the severity and risk of the contamination that is discovered.
- If asbestos or asbestos containing materials (ACMs) are discovered through field screening during construction:
 - Excavation activities are to cease; and engineering controls are to be enacted to mitigate dust. Mitigation will include soaking the area of suspected asbestos with water.
 - If necessary to continue work, personnel in the area affected by asbestos will wear appropriate PPE including half mask or full mask respirators with HEPA filters for which they have previously been fit-tested. Personnel air sampling will be required to demonstrate engineering control enacted to mitigate dust are effective.
 - Soils containing, or suspected to contain asbestos will be segregated, wetted, and covered until appropriate disposal is determined, following receipt of laboratory analyses.

Contamination Management Requirements

Contaminated material will be disposed of at approved facilities in accordance with provincial and federal regulations and follow the measures outlined in the NEB's Remediation Process Guide. Facilities for disposal must be pre-approved by Trans Mountain. This includes third party waste brokers, transporters, consultants and contractors. A list of Alberta and BC approved waste landfills for disposing of contaminated material are provided in Appendices D and E, respectively of the Waste Management Plan". The updated plan will be submitted to the Board prior to construction.

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.

2.0 FIRE CONTINGENCY PLAN

The Contractor will develop a Fire Contingency Plan (Volume 4C, Section 5.2.7) and a Fire Prevention Plan (Volume 4C, Section 5.2.8) that will include, at a minimum, the guidelines in the TMEP Health and Safety Management Plan. This plan will be used in conjunction with the Fire Contingency Plan and the Fire Prevention Plan during all phases of construction.

In the Event of a Wildfire

- The following response measures will be implemented, as warranted, in the event of a fire.
- Commence fire suppression measures immediately upon detection of a fire, provided that current fire behaviour allows personnel to safely proceed.
- Report location of fire as well as size, wind direction, fuels burning and immediate values at risk to the Fire Boss.
- The Fire Boss will report all wildfires immediately and relay general fire information to the Senior Compliance Advisor, who will advise the appropriate provincial, municipal or federal authorities.
- All equipment and personnel shall be made available to control the fire. Suppression efforts will take into consideration fire behaviour, safety, training and fitness of personnel, as well as equipment availability.
- The Fire Boss will inspect the fire as soon as possible and take charge of directing suppression measures until relieved by a responding authority official.
- Moveable material, particularly explosive or flammable materials and/or vehicles, will be promptly moved to a safe location whenever there is a possibility of being endangered by fire.
- Fire suppression efforts shall continue until the fire is extinguished, until it is no longer safe for Project personnel to respond to the fire, or until otherwise notified by the appropriate jurisdictional authority (*i.e.*, BC MFLNRO).
- The Fire Boss will ensure that all burning embers are extinguished and will monitor burn area for smouldering material. If available, employ infrared scanning equipment to detect any residual hot spots.

To Report a Wildfire:

BC - 800-663-5555 (or *5555 on most cellular networks).

General Fire Information

When a fire is encountered adjacent to or within the vicinity of the facility footprint, make note of the following fire and site conditions prior to reporting the fire:

- crew contact information;
- location of the fire;
- fuel the fire is burning in (trees, grass, etc.);
- approximate size of the fire;
- how quickly the fire is spreading;
- colour of the smoke;
- values at risk (lives, structures, etc.); and
- local weather (temperature, local wind speed and direction, etc.).

3.0 HERITAGE RESOURCES DISCOVERY CONTINGENCY PLAN

****Note: Personnel are NOT permitted to collect and/or keep any artifacts.**

The following procedures provide contingency measures for the discovery of heritage resources and during construction of the Project.

Heritage Resource Discovery during Construction

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

- The Environmental Inspector will notify the Construction Manager, Trans Mountain Environment (who will determine if the services of a Heritage Resource Specialist may be necessary) and the Senior Compliance Advisor, who will notify the appropriate regulatory authority as required.
- Prohibit the collection of any historical, archaeological or palaeontological 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, palaeontological 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.
- As and where required, a Heritage Resource Specialist will develop, if warranted, an appropriate mitigation plan in consultation with the Environmental Inspectors, the Construction Manager, the appropriate regulatory 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.

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 (*i.e.*, within 30 m) of the newly identified human remains. Work at that location may not resume until the measures below have been implemented.
- The Environmental Inspector will notify the Construction Manager, the Chief Activity Inspector, Trans Mountain Environment (who will determine if the services of a Heritage Resource Specialist may be necessary) and the Senior Compliance Manager, who will, if warranted, notify the local police and appropriate regulatory authorities.
- If there is potential for disturbance to the site due to trafficability or high public visibility, assign employees to stand watch until the Heritage Resource Specialist arrives.
- Stake or flag off the location to secure avoidance.
- Cover any exposed remains with clean plastic sheeting, tarpaulin, a blanket or other covering until the 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 Heritage Resource Specialist to inspect.
- The Contractor will only resume work in that area once the archaeological and forensic studies are complete, clearance has been granted by the appropriate regulatory authority and Trans Mountain has been advised that work can continue.

4.0 MARINE SPILL CONTINGENCY PLAN

4.1 Introduction

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

Purpose and Scope

Spill reporting procedures are applicable to all Trans Mountain construction activities. These procedures are specific to the WMT 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 WMT to ensure the protection of the public, employees and Contractors, the environment and company property. In addition, this plan will ensure that all releases of hazardous materials are reported to the appropriate authority, as required. As a federally regulated company, Trans Mountain is responsible for reporting any volume of spill at the WMT 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 WMT.

It should be noted that the WMT is currently operational and has an existing operational-phase ERP, which already addresses most potential spills that could occur during future construction activities. However, a few 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., drill rigs, pile drivers, dredgers and front-end loaders).

4.2 Response Organization

All 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 WMT 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). Details regarding the reporting and notification requirements are contained in Section 7.0 of this Appendix.

Emergency spill response equipment will be located, as a responsibility of the contractor, in the TMPEP WMT 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.

Immediate notification of a spill to the WMT Supervisor is crucial. Immediately contact local emergency response 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 (1-604-665-9086). 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 <https://www.portvancouver.com/marine-operations/port-information-guide/>).

Westridge Marine Terminal Contractor Responsibilities

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

Equipment

Emergency response equipment and materials will be provided to WMT Contractors to 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 WMT Supervisor, who will be able to source supplementary equipment through local service providers in the area.

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 WMT 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.

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.

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.

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.

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.

5.0 RARE ECOLOGICAL COMMUNITIES OR RARE PLANT SPECIES DISCOVERY CONTINGENCY PLAN

In the event that previously unidentified potential ecological communities or rare plants (vascular plant or bryophyte [moss or liverwort]), or lichens are discovered on or within 30 m of the facility construction and/or associated components prior to or during construction (*i.e.*, borrow sites, temporary access roads and temporary workspace footprint), follow the measures outlined below.

- Note the location of the potential rare plant, lichen or ecological community relative to the facility.
- Notify the Environmental Inspector. The Environmental Inspector will contact Trans Mountain Environment to discuss the need for a Vegetation Resource Specialist.
- Send a photograph of the potential rare element and any additional details regarding the element and the site to a qualified Vegetation Resource Specialist.
- Avoid further disturbance to the location or within 10 m of the location until a qualified Vegetation Resource Specialist has been consulted.
- If warranted, the Vegetation Resource Specialist will be required to attend the site and will determine if site-specific mitigation measures are required.
- The Vegetation Resource Specialist will then develop an appropriate site-specific mitigation plan in consultation with Trans Mountain following the Rare Ecological Community and Rare Plant Population Management Plan (see Section 5.0 of Volume 6 of the Environmental Plans); this site-specific plan will be developed in consultation with the Environmental Inspector.

6.0 SOIL EROSION AND SEDIMENT CONTROL CONTINGENCY PLAN

Where soil erosion by wind or water is evident during the construction phase of the WMT and associated components (e.g., access roads), all necessary Contractor equipment and personnel will be made available to control the erosion. During the construction phase, the Chief Activity Inspector in consultation with the Environmental Manager will determine appropriate procedures to be implemented to control soil erosion and other soil handling problems encountered. The Senior Compliance Advisor must be notified, who will notify the Appropriate Government Authorities (i.e., BC MOE and NEB), as warranted and as soon as practical, that contingency measures are being/have been implemented (see Contacts provided in Appendix A of this EPP). A record will be made of the location, timing, reason for implementation and measures implemented.

One or more of the following water/wind erosion control options listed below may be implemented, if warranted, where soil erosion is observed. Similar procedures to control erosion will be followed during the operational phase.

Soil Erosion by Water

- Shut down construction until the risk of erosion has been reduced or conditions improve.
- Install sediment fences near the base of slopes, if adjacent to a watercourse or wetland.
- Construct and/or install temporary berms of subsoil, coir logs or sandbags during construction activities on slopes where the risk of erosion is high.
- Salvage topsoil/root zone material and store away from the marine environment, if required.
- Replace salvaged topsoil/root zone material, if practical.
- Implement one or a combination of the following long-term mitigation techniques in terrestrial areas, as warranted.
 - Construct cross ditches or berms decreasing the spacing on steeper slopes or on more erodible soils.
 - Armour the upslope face of berms with coir matting or an erosion control blanket, logs or sandbags.
 - Apply an erosion control blanket, mulch or tackifier to hold soil.
 - Reseed and hand rake an annual cover crop or apply seed and install erosion control blankets.

Soil Erosion by Wind

Topsoil/Root Zone Material

- Temporarily shut down construction at the location where erosion is occurring until the risk of erosion has been reduced or conditions improve; the decision to shut down construction will be made following a discussion involving the Contractor, the Construction Manager and an Environmental Inspector.
- Consider using the following techniques, if wind erosion of the topsoil/root zone material windrow is of concern.
 - Apply water or tackifier (at rate recommended by the distributor) the topsoil/root zone material windrow.
 - Tamp the topsoil/root zone material windrow with suitable equipment.

- Consider using the following techniques if wind erosion of the topsoil/root zone material windrow is of concern after topsoil/root zone material replacement.
 - Seed with an annual or biannual cereal or short-lived perennial grass cover crop species.
 - Apply hydromulch or tackifier.
 - Install wind fences.

Soil Erosion/Sedimentation of Marine Riparian Areas

One or more of the following water/wind erosion control options listed below may be implemented, if warranted, where soil erosion is observed:

- plant rooted stock plants in the spring;
- transplant dormant shrubs and trees from areas adjacent to or within the vicinity of the WMT;
- seed the disturbed area with the appropriate approved native or non-native perennial grass seed mix and cover with erosion control blanket, where warranted; and
- reinforce sloping terrain/shoreline with rock riprap arming or rock gabions.

In the Event of Potential Sedimentation to a Waterbody

The Environmental Inspector will notify the Senior Compliance Advisor that contingency measures have been initiated and will maintain a record of the location, timing and reason for implementation of the contingency plan, if warranted. The Senior Compliance Advisor will notify the NEB that contingency measures have been implemented during the construction of the WMT, as soon as practical.

The procedures outlined below will be implemented progressively or individually as warranted, should an extreme precipitation event threaten the sediment control measures, or other circumstances occur that may render the existing sediment control measures inadequate:

- prohibit the operation of construction equipment close to the shoreline where there is a risk of sloughing, flooding of the work area or damage to sensitive aquatic species and/or habitat;
- install additional sediment fencing to prevent sediment-laden water from entering the marine environment;
- construct berms of sandbags, rock or coir logs on approach slopes to divert runoff from the development zone and onto well-vegetated lands or sediment retention ponds; the location and the composition of the sediment control structures will be approved by the Environmental Inspector; and
- implement one or a combination of the following mitigation techniques for long-term protection measures:
 - plant rooted stock plants in the spring;
 - transplant dormant shrubs and trees from areas adjacent to or within the vicinity of the construction area; or
 - reinforce the shoreline with rock riprap/cobble armouring or rock gabions.

7.0 SPILL CONTINGENCY PLAN

7.1 Introduction

Guidelines for the safe handling, storage, use and disposal of potentially hazardous materials, as well as spill prevention measures and guidelines for the refuelling and servicing of equipment, are provided in Trans Mountain's Waste Management Standard. The Contractor is to report all spills to an Environmental Inspector and the Environmental Manager. The Construction Manager or an Environmental Inspector will immediately notify Trans Mountain via the 24-hour Emergency Line that a spill has occurred. The Senior Compliance Advisor will notify the appropriate provincial and/or federal authorities, as required.

The timeline in which the reporting is to take place is dependent on the size of the spill. An immediately reportable spill is defined as a release of a substance that is likely to be an imminent environmental or human health hazard and/or meets or exceeds reportable volumes listed below, with more information provided in the CMP (Volume 10 of the Environmental Plans). Such spills will be immediately reported to the appropriate federal and/or provincial authorities. Spills with volumes that are not immediately reportable or the substance is not likely to be an imminent environmental or human health hazard are not required to be reported to the applicable federal and/or provincial authorities. Rather, these spills will be tracked and documented by the Environmental Inspectors and submitted to Trans Mountain for inclusion in their spill-tracking databases.

If there is any doubt that the quantity spilled exceeds reportable levels, the spill will be reported to Trans Mountain via the 24-hour Control Centre Emergency Line. The Trans Mountain RCT will determine if the spill should be reported to the appropriate provincial and/or federal authorities. Crucial information that will be provided to the 24-hour Control Centre Emergency Line includes name and telephone number of the caller, date and time of the call, material(s) spilled, location of the spill, estimated quantity spilled, cause of spill, actions taken to-date, assistance required, injuries and weather conditions (KMC 2017).

In BC, a reportable spill is defined by the BC *Environmental Management Act* as:

- a release of 100 L or more of: hydraulic oil, engine/lube oil, gasoline, diesel or solvents;
- a release of 25 L or more of waste oil;
- a release of 5 L or more of engine coolant;
- a release of 25 kg or more of contaminated soils; and/or
- any release to a waterbody or watercourse (see the Spill Scene Checklist in Attachment B2).

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 the MCTS is required (see <http://www.ccg-gcc.gc.ca/e0003876>). All accidental over side discharges should be reported immediately to the Operations Centre (1-604-665-9086). 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, page 95) provides more information and clarification regarding reporting requirements (see <https://www.portvancouver.com/marine-operations/port-information-guide/>). All spills, no matter what size or type material, will be reported to the Environmental Inspector by the worker discovering the spill.

Any sites contaminated by a spill will be assessed, remediation will be designed and disposal sites will be identified in accordance with the NEB Remediation Process Guide (NEB 2011). This document will be provided to the Construction Manager or designate and the Environmental Inspectors as part of the Environmental Education Program. Emergency contacts are presented in Appendix A.

7.2 General Measures

The following general measures are to be adhered to during construction of the TMEP.

- Maintain appropriate spill equipment at all work sites based on risk. The risk potential for site-specific spills will be used to determine the appropriate type of response equipment to be stored on-site and a suitable location for storage.
- Post specific instructions regarding applicable contacts and appropriate response actions to be taken in the event of a spill in the field construction offices.

7.3 Initial Response

The following actions will be taken upon detection of a **construction spill** specific to the TMEP.

- Ensure personal safety and the safety of others on-site and don appropriate personal protective equipment.
- The first person on the scene will execute the actions presented in the Spill Scene Checklist (Attachment B2).
- Report the spill to an Environmental Inspector and Chief Activity Inspector.
- When notified of a reportable spill, an Environmental Inspector or designate will immediately ensure that the following actions are taken, where applicable.
 - Action is taken to ensure safety of workers and the public.
 - An on-site Emergency Response Coordinator is designated.
 - The necessary equipment and personnel are mobilized, and measures are being implemented to stop the source of the spill, if safe to do so, and commence clean-up.
 - Trans Mountain Management are immediately notified of the spill.
 - Trans Mountain Management notifies the Senior Compliance Advisor, who will immediately notify the applicable provincial and federal agencies, and the NEB, of the spill if it meets the reporting threshold.
- The Contractor will make all resources available to contain and clean-up the spill.

In the event of an **oil spill associated with the existing Trans Mountain pipeline (TMPL)**, the Contractor must immediately notify Trans Mountain via the 24-hour Control Center Emergency Line (1-888-876-6711). In addition, the following actions will be taken:

- ensure action is taken to ensure safety of workers and the public; and
- attempt to contain the spill to the greatest possible extent without endangering the welfare of workers as directed by Trans Mountain until TMPL emergency spill responders arrive.

The Contractor will make all resources available to TMPL emergency spill responders to facilitate the containment and clean-up the spill.

In the event of a **spill associated with a third-party foreign pipeline**, the Contractor must immediately notify Trans Mountain via the 24-hour Control Center Emergency Line (1-888-876-6711). In addition, the following actions will be taken:

- ensure that action is taken to ensure the safety of workers and the public; and

- coordinate the containment of the spill to the greatest possible extent without endangering the welfare of workers until the third-party pipeline owner's emergency spill responders arrive.

The Contractor will, upon request of the third-party pipeline owner, make resources available to facilitate the containment and clean-up the spill.

7.4 General Spill Containment Procedures

The successful containment of a spill on land or water depends on a variety of factors including: ground cover and topography; hydrogeology; solubility of the material; viscosity of the liquid; water currents; soil permeability; and weather conditions.

The following general guidelines will be followed for containment of spills of hazardous materials.

- Ensure personal safety and safety of others on-site. The first person on the scene will execute the actions listed in the Spill Scene Checklist. This includes a review of the Material Safety Data Sheets.
- Assess the safety hazards of the situation and don appropriate personal protective equipment.
- Remove sources of ignition, if safe to do so.
- Identify the product, stop the source and physically contain the spill as soon as safe to do so.
- Avoid the use of water or fire extinguishing chemicals on non-petroleum product spills since many chemicals react violently with water and chemical extinguishing agents may release toxic fumes. In addition, chemicals may be soluble in water and dispersal makes containment and clean-up more difficult.
- Minimize traffic on contaminated soils.
- Use berms constructed with materials and equipment in proximity to the site to physically contain a spill on land. Deployment of booms will be necessary to contain a spill and prevent contamination spread on water.
- Clean-up will not be attempted without advice from the Environmental Inspector and Trans Mountain.

7.4.1 Spot Spills

Effects from small spot spills can generally be minimized and will not result in the suspension of activities if the appropriate actions listed below are promptly implemented. All small spills of fuels, hydraulic fluids or hazardous materials must be contained, cleaned up and reported immediately to an Environmental Inspector.

- An Environmental Inspector will approve methods to remove or reclaim contaminated soils, in consultation with a qualified specialist, if warranted. Heavily contaminated soil and vegetation will be disposed of at an approved facility s outlined in the Waste Management Plan (Section 3.0 of Volume 6 of the Environmental Plans).
- Locations where spot spills occur are to be recorded.
- All efforts will be made to clean up the release, if residual impacts remain, the steps to further assessing and remediating the contamination will be developed in accordance with the guidance set out in the NEB Remediation Process Guide.

7.4.2 Spills Occurring During On-site Transportation

The general guidelines listed below will be followed for the containment of materials spilled during transportation.

- Contain spilled product.
- Pump tanker truck or transportation vessel dry (into appropriate containers or alternative tanker truck).
- Remove tanker truck or transportation vessel from the site.
- Recover spilled product.
- Clean up contaminated area.
- Dispose of contaminated materials at an approved facility in accordance with the Waste Management Plan (Section 3.1 of Volume 6 of the Environmental Plans). All efforts will be made to clean up the release, if residual impacts remain, the steps to further assessing and remediating the contamination will be developed in accordance with the guidance set out in the NEB Remediation Process Guide.

7.4.3 Spills Adjacent to or into a Watercourse or Wetland

The general guidelines listed below will be followed for spills adjacent to or into a watercourse or wetland. Refer to Section 4.0 of this Appendix for contingency measures in the event of a spill to the marine environment.

- Construct berms and/or trenches to contain spilled product prior to entry into a watercourse or wetland.
- Deploy booms, skimmers and/or sorbents, if feasible, to contain and recover spilled material from a watercourse or wetland.
- Collect spilled product.
- Clean up the contaminated area, including downstream shorelines.

Dispose of contaminated materials at an approved facility in accordance with the Waste Management Plan (Section 3.1 of Volume 6 of the Environmental Plans). All efforts will be made to clean up the release, if residual impacts remain, the steps to further assessing and remediating the contamination will be developed in accordance with the guidance set out in the NEB Remediation Process Guide.

8.0 WET SOILS CONTINGENCY PLAN

Trans Mountain will assign Environmental Inspectors with sufficient training and soils-related experience to identify soils that are too wet for a particular activity and when the soils are sufficiently dry to allow the activity to resume. The decision to continue or suspend particular construction activities on lands with excessively wet soils will be made by the Construction Manager in consultation an Environmental Inspector. A record of the location, timing and reason for implementation of the Wet Soils Contingency Plan will be maintained by the Environmental Inspectors. In the event that activities are suspended, the Environmental Inspectors will notify the Senior Compliance Advisor as soon as practical, who will notify the NEB, if warranted.

The Environmental Inspectors will be responsible for monitoring ground conditions and ensuring that all suitable protection measures are implemented. Trans Mountain believes that it is critical to maintain effective communication between the Contractor, the Environmental Inspectors and the regulators (*i.e.*, the NEB, via the Senior Compliance Advisor). Therefore, if necessary, a meeting will be held in the field to ensure that all parties involved mutually understand the concerns associated with working in wet conditions.

Soils are considered to be excessively wet when the planned activity could cause: damage to soils either due to rutting by traffic through the surface material into the subsoil; soil structure damage during soil handling; or compaction and associated deformation of surface material due to heavy traffic.

Contingency measures will be implemented, if warranted, if one of the following indicators occurs:

- rutting of topsoil/root zone material to the extent in which admixing may occur;
- soil becomes deformed;
- excessive wheelslip;
- excessive build-up of mud on tires and cleats;
- formation of puddles; and/or
- tracking of mud as vehicles leave the WMT.

In order to avoid terrain disturbance and soil structure damage through rutting or compaction due to wet soil conditions, construction alternatives will be employed, when warranted, in the event of excessively wet surface. The contingency measures listed below will be implemented individually or in combination, as necessary, based on site-specific conditions.

Wet Soil Contingency Measures

- Salvage topsoil/root zone material from the WMT footprint to prevent mixing and rutting (note that topsoil/root zone material salvage cannot be conducted when soils are excessively wet).
- Delay construction until soils dry out.
- Restrict construction traffic, where feasible, to equipment with low ground-pressure tires or wide pad tracks.
- Prevent rubber-tired traffic from driving on areas of the WMT and associated components construction footprint with unsalvaged topsoil.
- Postpone work in highly sensitive areas and shift effort to low sensitivity areas.
- Restrict work to non-problem areas, such as well-drained soils, until conditions improve.
- Install geotextiles or matting in problem areas.

- Suspend construction activities and traffic in areas (outside of the development zone) with wet soil conditions until the soils dry out. Suspension of construction activities on the WMT and/or associated components construction footprint will be based on discussions between the Construction Manager and the Lead Activity Inspector and the Environmental Inspector, the Contractor, and, if warranted, the NEB. Recommencement of work once soils dry out must be authorized by the Construction Manager, in consultation with the Lead Activity Inspector.

Partial Suspension of Construction Activities and Traffic

The primary concern during wet soil conditions is the potential for rutting, compaction and loss of soil structure in the topsoil/root zone material. Criteria to be used in determining how to mitigate for wet or thawed soil conditions or to allow for a mutual decision by the Contractor, the Construction Manager and an Environmental Inspector to suspend activities until soils dry out are provided in Table B-1.

TABLE B-1

CRITERIA FOR THE SUSPENSION OF ACTIVITIES DUE TO EXCESSIVELY WET SOIL CONDITIONS OUTSIDE OF THE DEVELOPMENT ZONE

Topsoil/Root Zone Material Salvage Status	Construction Activity	Suspend Activity for Environmental Issue?
No salvage conducted	Soils handling (topsoil/root zone material - salvage/replacement)	Yes
Topsoil/Root Zone Material salvage in all areas outside of the development zone that will require grading	Materials storage and staging area	No
Topsoil/Root Zone Material replacement	Clean-up	Yes, heavy traffic not permitted; No, quad traffic likely acceptable

9.0 WILDLIFE SPECIES OF CONCERN DISCOVERY AND ENCOUNTER CONTINGENCY PLAN

9.1 Terrestrial or Marine Wildlife Species at Risk or Species of Concern

The following procedures provide contingency measures for the discovery of terrestrial or marine wildlife species prior to and during construction of the WMT and associated components (*e.g.*, access roads). A wildlife species at risk refers to wildlife species listed as Special Concern, Threatened or Endangered on Schedule 1 of the *SARA* and/or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and are Red or Blue-listed in BC or listed under the *Wildlife Act* (BC). Species of concern refers to wildlife species that have increased potential to be affected by Project activities due to spatial or temporal overlap with the Project during sensitive life stages and therefore may have identified setbacks and timing windows.

Terrestrial or Marine Wildlife Species at Risk or Species of Concern Discovery Prior to Construction

In the event that terrestrial or marine wildlife species at risk or species of concern or their site-specific habitat is discovered during wildlife or other studies at the WMT or other associated components (*e.g.*, access roads) the discovery will be assessed and appropriate mitigation measures will be determined by an Environmental Inspector in consultation with Trans Mountain Environment and a Wildlife Resource Specialist/Marine Wildlife Resource Specialist, as necessary, and as identified on the WMT Environmental Facility Drawing (see Appendix E). The wildlife or habitat will be assessed based on the following criteria:

- the location of the onshore or marine wildlife or habitat feature with respect to the proposed area of development;
- the presence of the topographic environment feature or terrestrial/marine riparian vegetation to effectively screen the wildlife or habitat from construction activities;
- the timing of construction versus the critical timing constraints for the identified species; and
- the potential for an alteration of construction activities to reduce or avoid sensory disturbance.

The mitigation measures to be implemented will be determined by a Wildlife Resource Specialist/Marine Wildlife Resource Specialist and may include the following:

- abide by seasonal timing constraints and the recommended setback distances (as provided by regulatory guidelines, where feasible);
- abide by daily timing restrictions on construction activities, where feasible;
- reduce the proposed area of disturbance and protect the site using fencing or clearly mark the site using flagging when located in the non-marine environment;
- alter or delay construction activities to avoid/reduce sensory disturbance; and
- inform all users of access restrictions in the vicinity of marked, flagged or fenced sites.

The locations of identified important terrestrial and marine wildlife and wildlife habitat encountered within the WMT and appropriate mitigation to be implemented at each known site that have been identified in the WMT Environmental Facility Drawing.

Terrestrial or Marine Wildlife Species at Risk or Species of Concern Discovery during Construction

Wildlife species at risk or species of concern and their habitat that have the potential to occur in the WMT construction footprint or associated components will be identified through the Environmental and Compliance Education Program. The Environmental Inspectors will be provided with detailed information on identifying wildlife species of concern and their site-specific habitat.

In the event of an observation of a wildlife species at risk or species of concern, the mitigation will vary depending on the species. For example, observations of songbirds and/or large mammals, where no associated habitat feature (*e.g.*, an active nest or mammal den) is present, may not warrant mitigation given their ability to move away from the construction area. For other species that may be restricted to a discrete area, mitigation measures (*e.g.*, salvage of individuals in compliance with the appropriate permit) will be reviewed and implemented as required.

In the event that wildlife species at risk or species of concern or their site-specific habitat is discovered during construction, the discovery will be assessed and appropriate mitigation measures will be determined. Upon discovery of a wildlife species of concern or habitat feature during construction, the following will occur.

- Suspend work immediately in the vicinity of any newly discovered wildlife species at risk or species of concern. Do not resume work at that location until the measures below are implemented.
- Notify an Environmental Inspector who will complete the appropriate record keeping/reporting and notify the Construction Manager.
- The Environmental Inspector will assess the discovery and, in consultation with the Construction Manager, will either allow construction to resume or, in the event of a confirmed or potential discovery, proceed by notifying:
 - Trans Mountain's Regulatory and Compliance Team; and
 - a Wildlife Resource Specialist.

A qualified Wildlife Resource Specialist will assess the discovery and determine the appropriate mitigation measures to be implemented in consultation with an Environmental Inspector, the Construction Manager and the appropriate government authority. The Wildlife Resource Specialist, in consultation with the Environmental Inspector and Trans Mountain Environment, will determine if site-specific mitigation is required and if it is necessary to visit the site.

9.1.1 Wildlife Encounter Contingency Plan

In the event of an encounter with wildlife during construction either at the construction site or on the commute to and from the construction site, follow the measures provided below.

- Report any incidents (*e.g.*, aggressive behaviour, nuisance behaviour and obtained food or garbage) with wildlife to an Environmental Inspector who will complete the appropriate record keeping/reporting and immediately notify the Senior Compliance Advisor. The Senior Compliance Advisor will notify the Appropriate Government Authority and, if warranted, the local Fish and Wildlife detachment (see Appendix A of this EPP).
- Report any trapped, injured or dead animals on-site to an Environmental Inspector, who, if warranted, will notify Trans Mountain's Regulatory and Compliance Team so the Appropriate Government Authority can be contacted to consult on appropriate action.
- Report the location and details of collisions with wildlife to an Environmental Inspector, who will notify the appropriate government authority and, if warranted, the local conservation officer, if applicable (see Appendix A of this EPP).

- Once the preceding contacts have been made, the Environmental Inspector will communicate the information to the Construction Manager.

The Environmental Inspectors will document all wildlife encounters during construction in a detailed record. This record will include, at a minimum: date; weather conditions; location; wildlife species encountered; the type of encounter (*e.g.*, passive, aggressive, etc.); and, if applicable, any actions taken by Project staff to address the situation. Wildlife encounter records will be kept on file by Trans Mountain and provided to the Appropriate Government Authority and Aboriginal groups upon request.

Wildlife Sighting Information

Name of Observer: _____ Date of Observation: _____

Location of Observation (KP): _____ Location Name (if applicable): _____

UTM Zone: _____ Easting: _____ Northing: _____

Wildlife Observation:

Species	
Observation Type (e.g., visual, heard animal, observed sign, etc.)	
Age (adult, young, unknown)	
Sex (male, female, unknown)	
Number observed (include numbers of males/females if known)	
Habitat Description (e.g., foreshore)	
Behaviour of Animal (describe what the animal was doing)	
Aggressive Behaviour (Yes or No; if yes describe)	
Additional Comments	

Name of Environmental Inspector Card Submitted to: _____

Date of Submission: _____

10.0 TRADITIONAL LAND USE SITES DISCOVERY CONTINGENCY PLAN

10.1 Traditional Land Use Sites Identified Prior to Construction

In the event that TLU sites are identified during supplemental studies with Aboriginal communities prior to WMT construction, the sites will be assessed and appropriate mitigation measures will be determined. The TLU sites will be assessed based on the criteria as follows:

- the location of the TLU site with respect to the area of development;
- the relative importance of the TLU site to the applicable First Nation community; and
- the potential for an alteration of construction activities to reduce or avoid sensory disturbance.

The mitigation measures listed below have been successful in mitigating effects on TLU sites. Alternative site-specific mitigation strategies may also be recommended by Aboriginal communities, or the Aboriginal Monitor(s) for the construction site. The mitigation measures that may be implemented will be dependent on the type of site identified and its proximity to the construction footprint.

Trapping

Common species of birds and eggs harvested include goldeneye, canvasback, ruddy duck, wood duck, American wigeon, northern pintail, mallard, northern shoveler, green-winged teal, grebe and murre. Traditional harvests of sea mammals may include the hunting of seals, sea lions and whales.

Successful and proven mitigation for potential impacts on trapping sites include:

- adhering to measures to reduce collisions and acoustic impacts to wildlife; and
- effective prevention of spills.

Additional site-specific mitigation measures will be refined and optimized in the field and through community discussions, as warranted.

Fishing

Activities in the inter-tidal areas may include harvesting of shellfish (*e.g.*, clams, mussels, cockles) while deeper waters may include harvest collection of crabs, crustaceans and fish stocks of herring and halibut.

The practice of traditional fisheries relates to the species harvested (inclusive of shellfish and crustaceans) at various life cycle stages (*e.g.*, eggs, juvenile, adult), fishing techniques, and the nature of specific bays and inlets. Fishing methods may include but are not limited to angling, gigging, spear-fishing, dip netting, gill netting, and the construction and use of fish traps and weirs. While fishing activities vary with changes in seasonal water flow and variation in fish stocks, fisheries often exhibit habitual repeated use. Secondary fishing activities relate to the processing of harvests, and may include processing yards, smokehouses, drying racks, and fish-grease rendering features.

Successful and proven mitigation for potential impacts on fishing sites include:

- adhering to species-specific timing constraints, to the extent feasible;
- obtaining applicable permits and approvals prior to construction; and
- effective prevention of spills.

Additional site-specific mitigation measures will be refined and optimized in the field and through community discussions, as warranted.

Plant Gathering

Plant gathering activities extend to marine and freshwater plants, including kelp, marine flowering plants, benthic and detached algae, brown algae, red algae, green algae, and phytoplankton.

Successful and proven mitigation for potential impacts on plant gathering sites include:

- obtain all applicable permits and approvals for weed control;
- harvest plants prior to construction; and
- effective prevention of spills.

Additional site-specific mitigation measures will be refined and optimized in the field and through community discussions, as warranted.

Trails and Travelways

Trails and travelways activities extend through Burrard Inlet and the Westridge Marine Terminal area.

Successful and proven mitigation for potential impacts on trails and travelways include:

- early notification of activities;
- confinement of all activities to the designated workspace; and
- allow for safe passage and navigation through the area.

Additional site-specific mitigation measures will be refined and optimized in the field and through community discussions, as warranted.

Habitation Sites

Habitation sites include traditional campsites, cabins and settlements. Campsites typically have defined hearths (fire rings), de-limbed trees, tent frames and/or miscellaneous cached or discarded camping supplies and equipment. Cabin structures represent a more permanent occupation of the land and include central log or timber-framed structures, traditional activity areas such as drying racks and smoking tents, and ancillary equipment storage areas. A group of cabins or campsites may signify a long-term or intermittent occupation. A settlement may have been used seasonally or throughout the year, depending on location or necessity. The relative size and nature of habitation sites continuously evolve based on how families and communities grow and often expand from campsites to cabins and possibly to settlements.

Successful and proven mitigation measures for potential impacts on habitation sites include:

- avoidance of the site;
- detailed mapping and a photographic recording of the location; and/or
- implementation of detailed recording and controlled excavations.

Gathering Places

Aboriginal people often gather to share in ceremonial activities, exchange items of trade, arrange and celebrate marriages, and for other activities. Additionally, indigenous grave sites are sometimes recorded in the general area of large gathering places. Such gathering places have historical, ceremonial, cultural and economic significance to Aboriginal groups.

Potential effects on gathering places may be mitigated through:

- avoidance of the site; and
- detailed recording and mapping.

However, the visual effect will be assessed in the field and site-specific mitigation measures will be refined and optimized, as warranted.

Sacred Areas

Sacred areas include burials, vision quest locations, rock art panels, birth locations and ceremonial places, among others. A particular element is often only a small component of a larger spiritual complex, which can encompass topographic features and may be, by its very nature in the context of Aboriginal spirituality, inestimable and irreplaceable.

Mitigation measures for potential impacts on sacred areas may include:

- avoidance of the site; and
- detailed recording and mapping.

However, additional site-specific mitigation measures will be refined and optimized in the field and through community discussions, as warranted.

10.2 Traditional Land Use Sites Discovered During Construction

Possible indications that a location might be a previously unidentified TLU site may include the observation of manufactured materials or alteration of natural materials, which appear to be derived from the activities of traditional land users. In the event that previously unidentified TLU sites are identified during construction of the pipeline, the following measures will be implemented, as warranted.

- Flag or fence off the previously unidentified TLU site. Work at that location may not resume until the following measures are conducted. Notify an Environmental Inspector, who will notify the Construction Manager or designate, the Aboriginal Monitor and the Heritage Resource Specialist.
- The Heritage Resource Specialist and the Aboriginal Monitor will assess the site and develop an appropriate mitigation plan using the information listed above.
- The potentially affected Aboriginal group(s) will be informed of the discovery and the mitigation measures to be implemented.

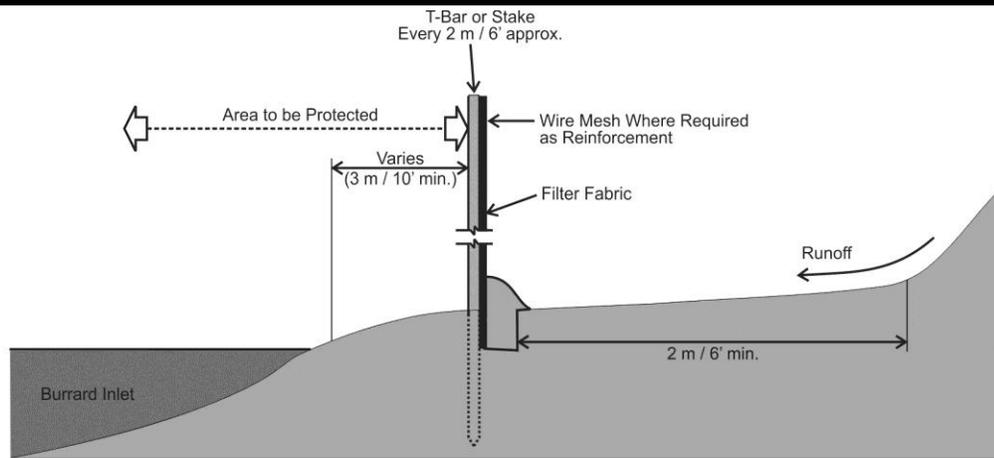
ATTACHMENT B1

SPILL SCENE CHECKLIST

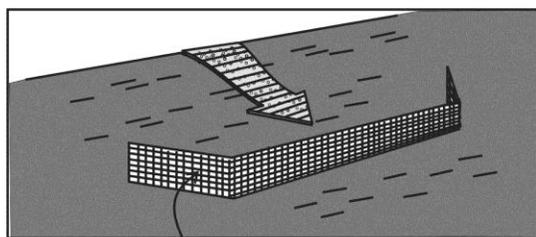
Note: The following activities will be taken by the first person on the scene of a hazardous material spill or release or a spill of other potentially deleterious material into a watercourse or wetland or environmentally sensitive area, if feasible.

- (a) Ensure personal safety and safety of others on-site and don appropriate personal protective equipment. _____
- (b) If possible without further assistance, assess the safety hazards of the situation, ensure safety of workers and the public and identify the composition (see Spill Report Form - next page) of the spilled material via the Material Safety Data Sheets that are available for each controlled substance. _____
- (c) If feasible and safe to do so, remove any sources of ignition, cut off the source of the spill and initiate a release response plan (*i.e.*, control, contain and clean up). While efforts have been initiated to contain the spill, immediately notify the Trans Mountain Construction Manager, or designate and Environmental Inspector. If the Environmental Compliance Manager, or designate, cannot be immediately contacted, notify Trans Mountain's 24-hour Emergency Line. These people will, as required, contact the appropriate authority as well as applicable federal and provincial agencies and the NEB. _____
- (d) Once the source has been cut off, attempt to contain the spilled material. Seek qualified assistance if necessary. _____
- (f) Take note of details such as time, location, material, volume, corrective actions, for reporting criteria. _____
- (g) In BC, Trans Mountain will provide an immediate verbal report to the BC Ministry of Environment 1-800-663-3456 (24-hour emergency line). Where requested to do so by an environment officer, a written report shall also be filed with the department. In BC, a spill of 100 L or greater must be reported for all Class 3 (Flammable Liquids) spills. _____

APPENDIX C
DRAWINGS/DETAILS

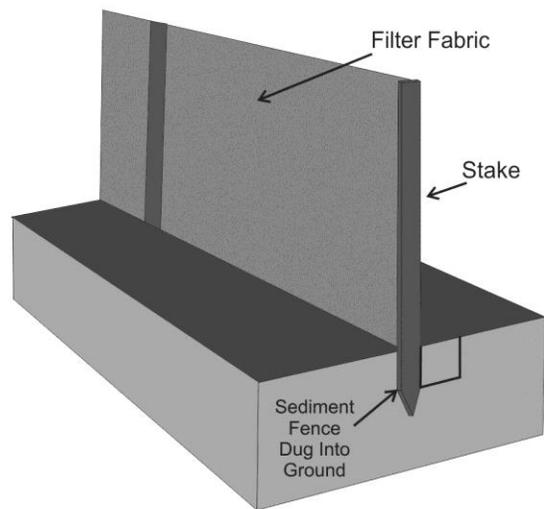


Profile View
(Not to Scale)



Filter Fabric
with Wire Mesh

Oblique View
(Not to Scale)



Oblique View
(Not to Scale)

Representation Only

Notes:

1. Install sediment fences at the base of cut/fill areas to reduce sediment discharge into the marine environment, where warranted.
2. Place sediment fences a minimum 2 m (6 feet), if feasible, from the toe of the slope in order to increase ponding volume.
3. Install sediment fences as soon as practical following clearing if it is determined by the Environmental Inspector that the sediment filtering properties of the cleared vegetation have been affected.
4. In areas with frequent traffic, install two or more sediment fences in a staggered and overlapped configuration to allow vehicle passage without removal or opening of the sediment fence.
5. Ensure sediment fence is keyed into the substrate. Excavate a narrow trench, place the base of the sediment fence in the trench and place the fill back into the trench, securing the sediment fence in place.
6. Maintain sediment fences in place at the base of the approach slopes until revegetation of the construction site is complete.
7. Ensure that sediment fences, if removed or damaged, are reinstalled or repaired prior to the end of the work day.
8. Remove synthetic sediment fences after the disturbed area is stabilized.

TRANS MOUNTAIN EXPANSION PROJECT

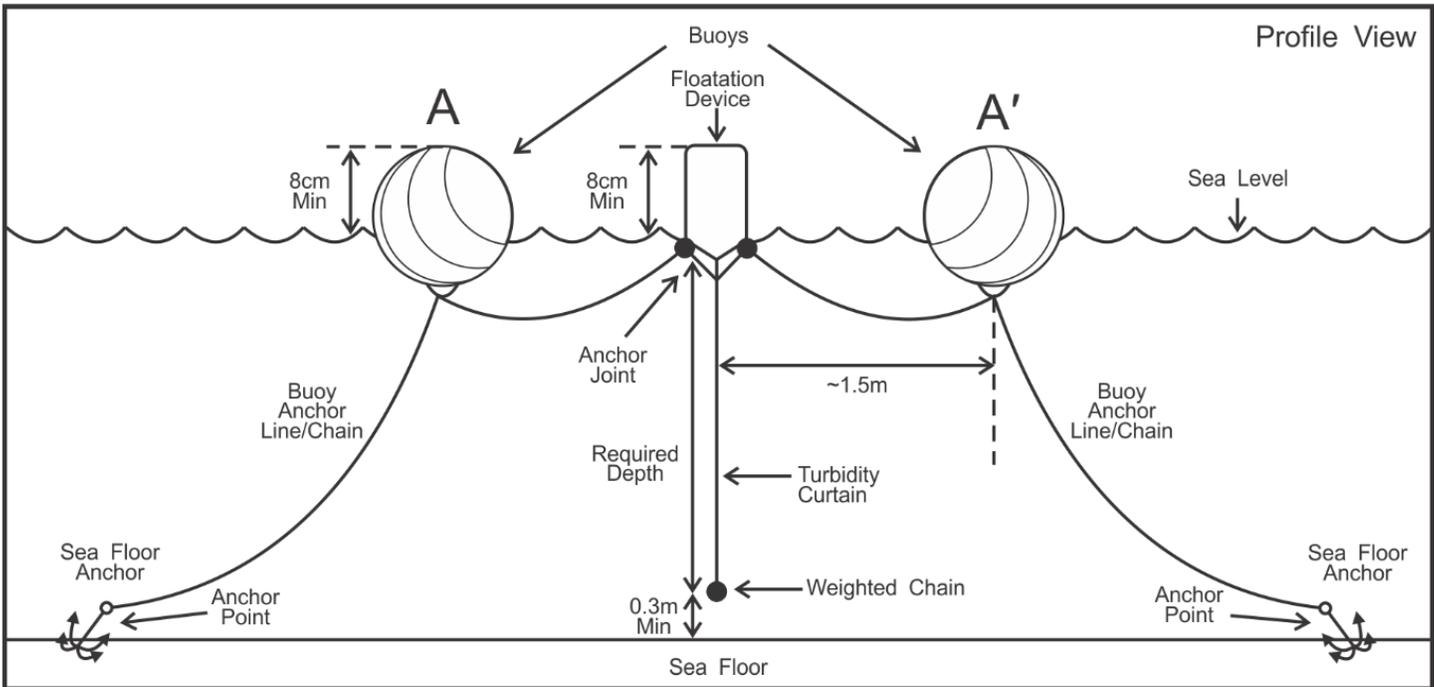
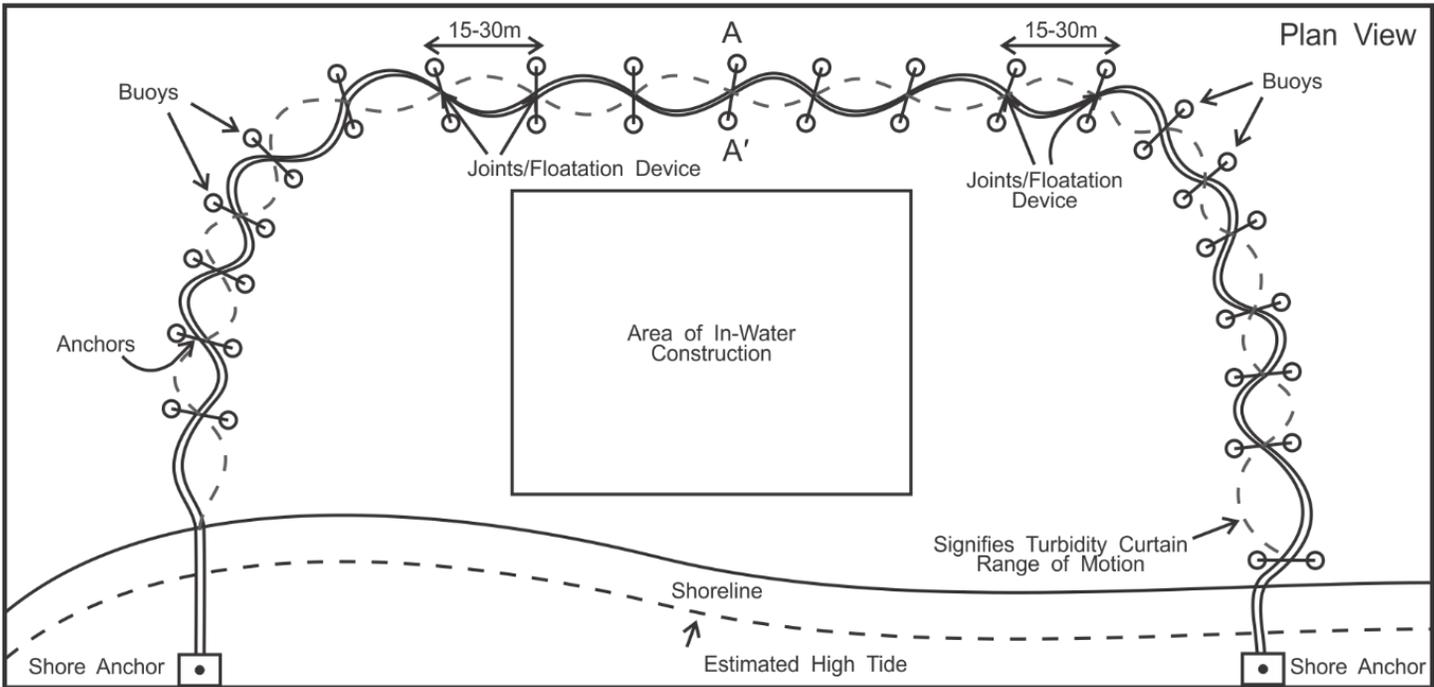


SEDIMENT FENCE

687945

March 2018

Drawing 1



TRANS MOUNTAIN EXPANSION PROJECT



TURBIDITY CURTAIN INSTALLATION (TIDAL CONDITIONS)

Notes:

Design, Construction and Installation Considerations

1. Proper placement and design is critical and qualified specialists should be involved. Ensure all required permits and approvals are in place prior to installation.
2. Install turbidity curtains parallel to the direction of flow, where practical.
3. Prior to installation, determine the appropriate required length (based on tidal conditions and water depth) of the turbidity curtain required to achieve maximum effective depth. Typically, turbidity curtains that are installed in waters deeper than 3-4 m cause increased load and strain on the mooring system, resulting in reduced effective depth.
4. Prior to installation, determine the appropriate sized gap (minimum 0.3 m) required between the sea floor and the bottom of the turbidity curtain (determined during mean low tide conditions). This gap is designed to prevent increased turbidity, resulting from contact between the curtain and the sea floor during tidal flows. In the event that the curtain must be extended to the sea floor, a heavy woven pervious filter fabric should be used as a replacement for standard turbidity curtain material (*i.e.*, an impervious geotextile). Heavy woven pervious filter fabric allows water to penetrate the fabric surface, reducing pressure on the curtain during tidal activity.
5. When determining the amount of required material, an additional 20% of total length should be acquired in order to ensure enough material is available to reduce stress on the system during tidal activities. Ensure that the total enclosed area accounts for periods of high tide.
6. Prior to installation, ensure any seams in the turbidity curtain fabric are appropriately enclosed to ensure full strength and effectiveness is achieved.
7. Determine/set appropriate shoreline anchor points (*i.e.*, an existing pile).
8. Set appropriate anchor points and joints that have sufficient holding power to retain the turbidity curtain under typical tidal conditions for the area. Ensure anchors are positioned to be on both sides of the turbidity curtain to minimize movement and reduce the risk of the curtain overrunning and pulling out the anchors during tidal fluctuations. Maintain a 15-30 m continuous gap between anchor points/joints. Ensure anchors are installed above the high tide mark.
9. Install appropriate bottom anchors (*i.e.*, grappling hook, plow, fluke type) required for the sea floor conditions in the work area. Bottom anchors should be installed to hold the turbidity curtain in the appropriate position without affecting the turbidity curtain. Anchor lines should be attached to the buoys, as opposed to the turbidity curtain, to prevent submersion of the floatation device during tidal activity or increased strain on the turbidity curtain. Slack in the anchor line should be sufficient to allow the buoy and curtain to adjust with tidal changes without causing restrictions in the buoy or turbidity curtain, or submerging/pulling the turbidity down. Regular maintenance checks should take place to ensure anchor lines remain intact and to remove any entangled debris.
10. Select bright coloured (*e.g.*, orange, yellow) buoys and floatation devices that will attract the attention of boaters and other water-users within the vicinity of construction. All floatation devices and buoys will be flexible, buoyant units, contained in an individual sleeve or collar attached to the curtain. Required buoyancy of the floatation device will be sufficient enough to support the weight of the turbidity curtain and maintain a freeboard of at least 8 cm above the water surface.
11. Following anchor placement, secure the furled turbidity curtain (floatation upper and weighted lower) firmly to one of the onshore anchor points and move sequentially through all anchor points until the entire turbidity curtain is in position. If required, make any adjustments to the anchor placement, as deemed necessary, to ensure proper installation is achieved. Once secure, the furling lines may be loosened to allow the turbidity curtain to drop. Ensure turbidity curtains reach the appropriate predetermined depth and, if required, ensure an appropriate gap exists between the bottom of the curtain and the sea floor.

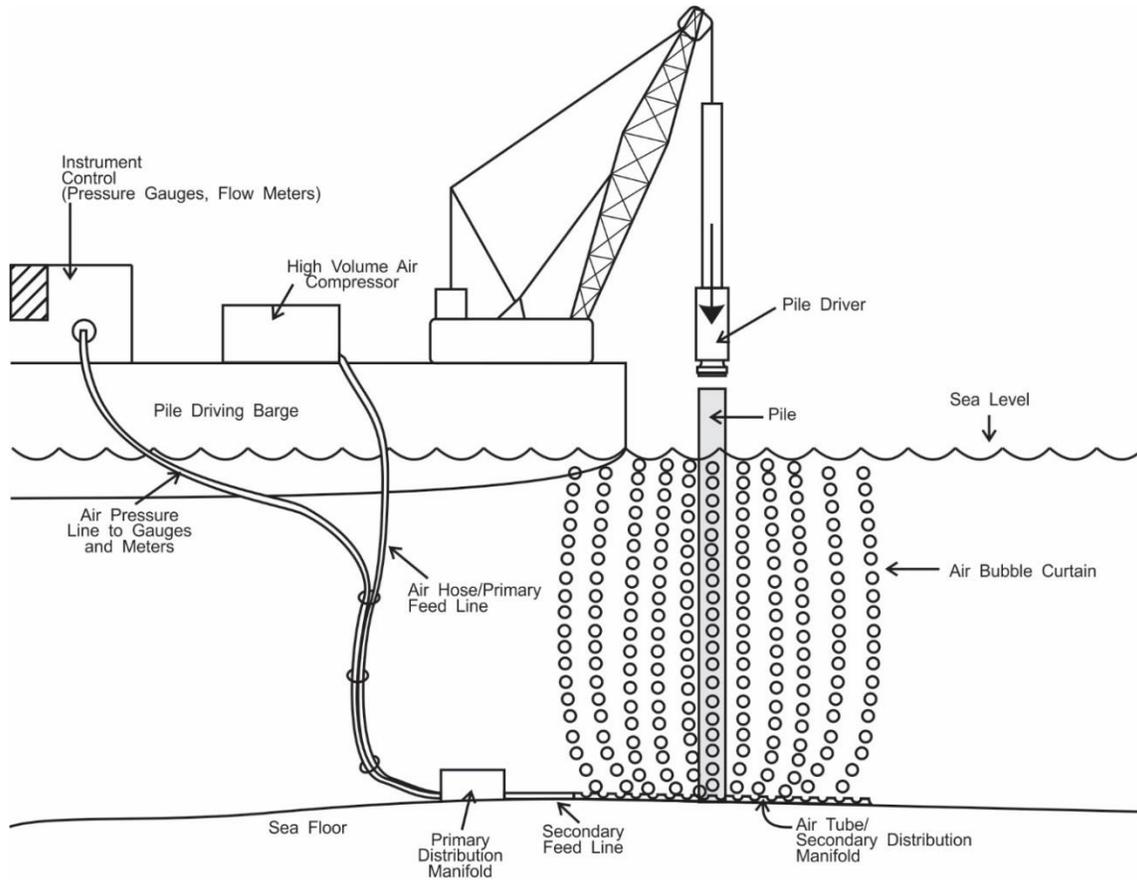
Removal Considerations

1. Prior to removal, ensure all sediment has sufficiently settled within the contained area. Allow at least 6 to 12 hours (minimum) following in-water activity for sediment to settle. If required, remove sediment to restore the original depth/contour or to achieve the planned elevation. Any excavated materials that will not be returned to the sea floor (spoils) must be taken to an upland area to be stored and stabilized or disposed of properly.
2. Remove all components related to the installation of the turbidity curtain in such a manner as to minimize turbidity.
3. Furl the turbidity curtain prior to removal from the water to reduce the risk of damage to the geotextile material.
4. Ensure the shore is free of debris (*i.e.*, sharp rock, garbage, etc.) prior to removal of the turbidity curtain in order to minimize damage to the geotextile material.

TRANS MOUNTAIN EXPANSION PROJECT



TURBIDITY CURTAIN INSTALLATION (TIDAL CONDITIONS)



Notes:

1. Proper placement and design is critical and qualified specialists be involved in designing and implementing this mitigation measure. Ensure appropriate deployment hardware is available for the installation of the designed air bubble curtain.
2. Determine the number of layers and secondary distribution manifolds required for proper installation (*i.e.*, if the water column is deeper than 10.5 m, a second layer of secondary distribution manifolds will be required. If the water column is deeper than 21 m, a third layer of secondary distribution manifolds will be required). Larger manifolds, or multiple manifolds, will be required if the pile is inclined in order to obtain 100% coverage.
3. Determine the total length of secondary feed line required to carry an appropriate volume of air to the secondary distribution manifold(s). Keep secondary feed line lengths as short as possible to reduce wear on the lines during recovery and installation. Back pressure at the exit point, in-line friction and fitting losses should be considered when determining an appropriate length and inside diameter of the secondary feed lines. The appropriate number of supply lines required will be based on inside diameter of the secondary feed line and the total number of holes within the secondary distribution manifold(s).
4. Determine an appropriate sized compressor and primary feed line. The primary feed line should be sized to carry the total required capacity of the compressor to the primary distribution manifold.
5. Install the primary distribution manifold between the primary feed line and the secondary feed line(s). The primary distribution manifold will accept air from the primary feed line and redistribute it to the secondary feed line(s). Ensure valves are installed on the primary distribution manifold for each feed line. The primary distribution manifold should be easily accessible to allow for adjustments of air flow, if required.
6. Install appropriate meters and gauges for the primary feed line and each secondary feed line in an instrument control area, in order to monitor flow and pressure and ensure effectiveness of the system is maintained at all times.
7. Following installation of all required components, ensure that the bubble curtain covers 100% of the circumference of the pile. It is preferable to have multiple small bubbles surrounding the pile than a few large bubbles.
8. Monitoring of flow, pressure, coverage and effectiveness will continue for the duration of the pile installation or in-water activity.

TRANS MOUNTAIN EXPANSION PROJECT



AIR/BUBBLE CURTAIN INSTALLATION (PILE INSTALLATION)

APPENDIX D
RESOURCE-SPECIFIC MITIGATION TABLE

TABLE D-1

RESOURCE-SPECIFIC MITIGATION MEASURES FOR ENVIRONMENTAL FEATURES ENCOUNTERED WITHIN THE WMT

Facility/Terminal Location	General Description	Wildlife and Wildlife Habitat	Vegetation Rare Plants/Weeds/Timber	Wetlands	Watercourses	Soils	Other	Archaeology
Westridge Terminal d-047-D/092-G-07	<ul style="list-style-type: none"> The WMT is located within the municipal boundaries of the City of Burnaby. All Project activities will occur on reclaimed foreshore lands owned by Trans Mountain with the exception of a small portion of land located between the railway and the shoreline, which is leased from the Canadian Pacific Railway. The current land use at this facility site is industrial with some previously disturbed and undisturbed lands. The eastern and southeastern sides of the terminal boundaries are treed land. 	<ul style="list-style-type: none"> Refer to mitigation measures under the heading "Species at Risk or Species of Concern" and "Wildlife (Terrestrial or Marine)" in Section 6.0 of this EPP. Initiate clearing and construction activities outside of the migratory bird nesting period (March 26 to August 16), where feasible. Refer to mitigation measures for migratory birds provided in Section 6.0 of this EPP. A bald eagle nest was recorded adjacent to the southeast boundary of the WMT (WILD-172). Determine if any active stick nests (e.g., bald eagle and great blue heron) are located in the area to be cleared or adjacent to the WMT immediately prior to clearing. Follow the measures outlined in the Bald Eagle Nest Management Plan: Westridge Marine Terminal for mitigation measures to be implemented prior to construction. These measures include: <ul style="list-style-type: none"> Install nest deterrent within the known bald eagle nest at the WMT upon confirmation that the nest is inactive and the bald eagles have dispersed from the area. Adhere to the conditions of the <i>Wildlife Act</i> Permit (Permit SU17-264155) issued for the installation of the nest deterrent. Install artificial nests within two alternate nest trees to reduce the risk of lost nesting opportunities. The nest deterrent and artificial nests will be installed by a qualified arborist upon confirmation that the nest is inactive and the eagles have dispersed from the area. The installation will be completed prior to October 2017 (when nest evaluation and territory establishment is expected to occur). 	<ul style="list-style-type: none"> No rare plant concerns identified. Knotweed and Himalayan blackberry have been recorded at the WMT. Ensure that all vehicles will arrive and leave the site clean of soil and debris to prevent the transfer of weeds. Refer to mitigation measures for weeds provided in Section 6.0 of this EPP in the event that weeds are encountered during construction. Timber disposal – no burning 	<ul style="list-style-type: none"> No wetlands present. 	<ul style="list-style-type: none"> One unnamed channel (S6), BC-789, is located within the Westridge Marine Terminal. Implement the appropriate measures for non-fish-bearing watercourses outlined in Section 14 of the Pipeline EPP and Section 7.0 of the Westridge Delivery Lines Resource-Specific Mitigation Tables. Water quality monitoring is not required, given the lack of direct connectivity with fish habitat downstream and the absence of fish habitat within the immediate zone of influence 	<ul style="list-style-type: none"> No topsoil salvage or root zone material salvage is required in areas of disturbed land. Salvage topsoil/root zone material (minimum 15 cm, maximum 40 cm) from undisturbed areas where construction activities will take place. Refer to mitigation measures for soils handling provided in Section 8.0 of this EPP and the Soil Handling Contingency Plan (Appendix B of this EPP). If off-site movement of salvaged topsoil/root zone material or subsoil is required, adhere to conditions specified in the applicable permits. 	<ul style="list-style-type: none"> Seed temporarily disturbed areas with the following seed mix at the prescribed rate: <ul style="list-style-type: none"> turf-type tall fescue – 40%; hard fescue – 40%; turf-type perennial ryegrass – 20%; broadcast seeding rate: 25 kg/ha; drill seeding rate: 10 kg/ha; and hydroseeding: 50-75 kg/ha. In areas with ongoing maintenance constraints (e.g., high slopes or where access for vegetation maintenance is restricted), an alternative seed mix with low-growth plants may be warranted. Consult with an Environmental Inspector to confirm the appropriate seed mix and suitable locations. 	<ul style="list-style-type: none"> Should Project activities involve ground disturbance within the area of archaeological potential identified by the AOA (i.e., under the existing railbed) archaeological monitoring will follow the methods outlined in HIP 2017-0167. That work will be documented in the final report, to be reviewed and approved by BC MFLNRO.

APPENDIX E

WESTRIDGE MARINE TERMINAL ENVIRONMENTAL FACILITY DRAWING

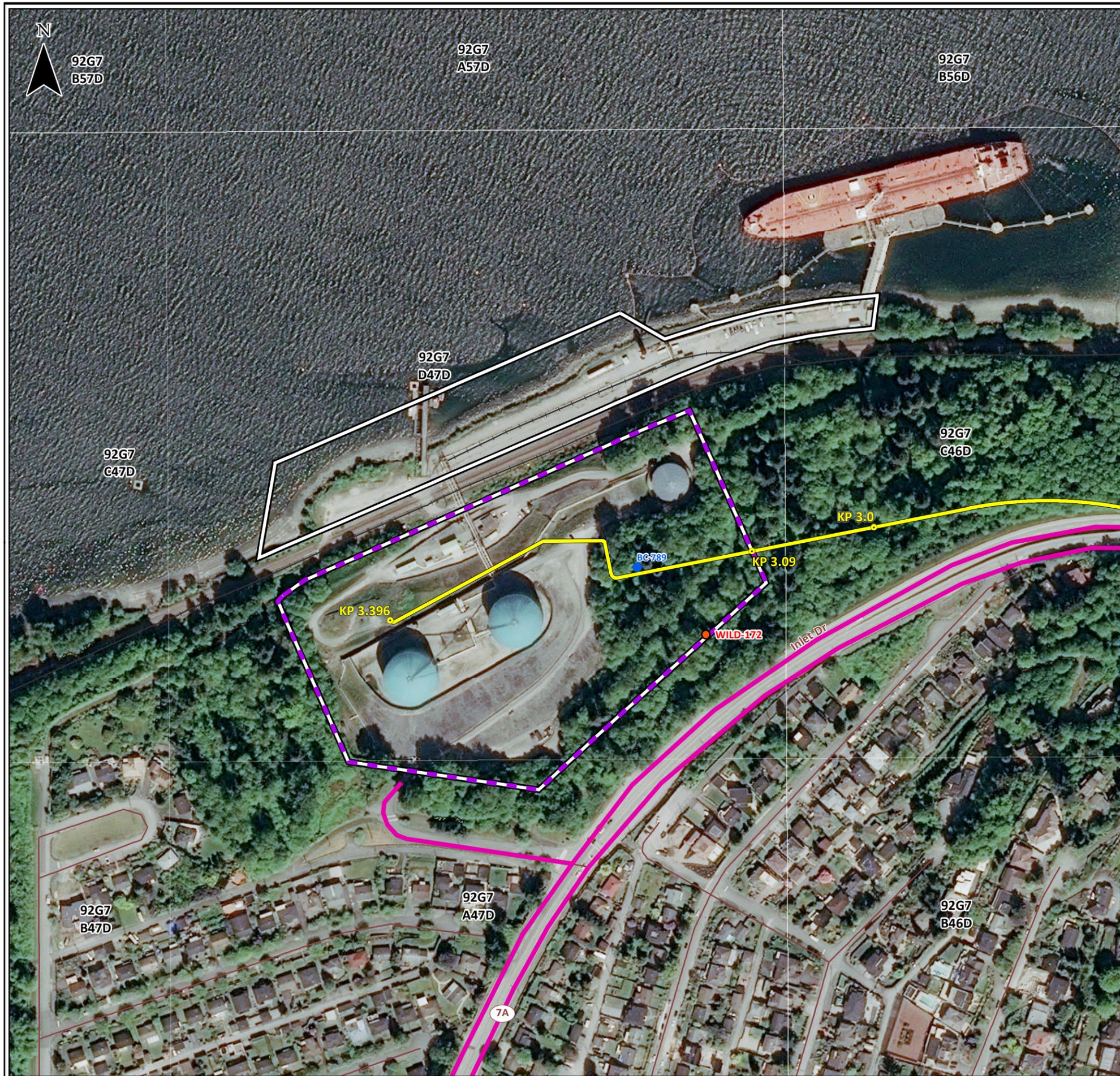


FIGURE EFD-17
ENVIRONMENTAL FACILITY DRAWING FOR THE WESTRIDGE MARINE TERMINAL
TRANSMOUNTAIN EXPANSION PROJECT



- Kilometre Post (KP)
- Raptor Nest
- Highway
- Proposed Pipeline
- Watercourse Crossing
- Railway
- - - Facility Fence Line
- Project Sanctioned Access Road
- Facility Footprint
- Road

General Information:
 The Westridge Marine Terminal is located within the municipal boundaries of the City of Burnaby. All Project activities will occur on reclaimed foreshore lands owned by Trans Mountain with the exception of a small portion of land located between the railway and the shoreline, which is leased from the Canadian Pacific Railway (CPR). The current land use at this facility site is industrial with some previously disturbed and undisturbed lands, the eastern and southeastern sides of the terminal boundaries are treed land.

Archaeology:
 Further Archaeological Evaluation is recommended for the foreshore area of WMT. Archaeological Evaluation complete for the remainder of WMT. Refer to the mitigation measures in Section 6.0 of this EPP if historical resources are discovered during construction.

Reclamation:
 Seed temporarily disturbed areas with the following seed mix at the prescribed rate.
 Turf-type tall fescue – 40%
 Hard fescue – 40%
 Turf-type perennial ryegrass – 20%

Broadcast seeding rate: 25 kg/ha
 Drill seeding rate: 10 kg/ha
 Hydroseeding: 50-75 kg/ha

In areas with ongoing maintenance constraints (e.g., high slopes, or where access for vegetation maintenance is restricted), an alternative seed mix with low growth plants may be warranted. Consult with an Environmental Inspector to confirm the appropriate seed mix and suitable locations.

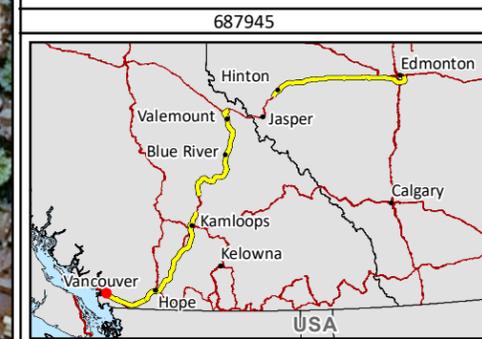
Soils:
 No topsoil salvage or root zone material salvage is required in areas of disturbed land. Salvage topsoil/root zone material (minimum 15 cm, maximum 40 cm) from undisturbed areas where construction activities will take place. Refer to mitigation measures for soils handling provided in Section 8.0 of this EPP and the Soil Handling Contingency Plan (Appendix B of this EPP). If offsite movement of salvaged topsoil/root zone material or subsoil is required, adhere to conditions specified in the applicable permits.

Vegetation Rare Plants / Weeds / Timber:
 No rare plant concerns identified. Knotweed and himalayan blackberry have been recorded at the Westridge Marine Terminal. Ensure all vehicles will arrive and leave the site clean of soil and debris to prevent the transfer of weeds. Refer to mitigation measures for weeds provided in Section 6.0 of this EPP in the event that weeds are encountered during construction. Timber disposal – no burning

Watercourses and Fish Habitat:
 One unnamed channel (S6), BC-789, is located within the Westridge Marine Terminal. Implement the appropriate measures for non-fish-bearing watercourses outlined in Section 14 of the Pipeline EPP and Section 7.0 of the Westridge Delivery Lines Resource Specific Mitigation Tables. Water quality monitoring is not required, given the lack of direct connectivity with fish habitat downstream and the absence of fish habitat within the immediate zone of influence.

Wetlands:
 No wetlands present.

Wildlife:
 Initiate clearing and construction activities outside of the migratory bird nesting period (March 26 to August 16), where feasible. Refer to mitigation measures for migratory birds provided in Section 6.0 of this EPP. A bald eagle nest was recorded adjacent to the southeast boundary of the WMT (WILD-172). Determine if any active stick nests (e.g., bald eagle, great blue heron) are located in the area to be cleared or adjacent to the WMT immediately prior to clearing. Note, a Nest Management Plan is being prepared for the Project for those nests that have been identified. This includes a bald eagle nest (an active heron colony has not been identified within the area). The measures in the Bald Eagle Nest Management Plan have been developed in consultation with BC MFLNRO and will be implemented prior to Project activity at the WMT.



687945

Rev 5, March 2018

SCALE: 1:3,000

(All Locations Approximate)

Projection: NAD 1983 UTM Zone 18N
 Orthorectified aerial imagery & Facility Footprints provided by KMC 2016; Proposed Pipeline SSEID005.1 & KPs provided by UPI April 3, 2017; Transportation: BC MFLNRO 2012; NRCan 2015.
 Watercourse Crossings: GeoMarine Environmental Consultants February 28, 2016.
 Portions of this document include intellectual property of Esri and its licensors and are used under license.
 This document is provided by Kinder Morgan Canada Inc. (KMC) for use by the intended recipient only. This information is confidential and proprietary to KMC and is not to be provided to any other recipient without the written consent of KMC. It is not to be used for legal, engineering or surveying purposes, nor for doing any work on or around KMC's pipelines and facilities, all of which require KMC's prior written approval.
 Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SMZ Checked By: DJN

APPENDIX F

CONSULTATION AND ENGAGEMENT

Consultation and engagement activities related to the mitigation measures in the WMT EPP were completed with Appropriate Government Authorities and potentially affected Aboriginal groups. Opportunities to discuss the mitigation measures and identify issues or concerns were also provided to public stakeholders during meetings, workshops and ongoing engagement activities.

Consultation and engagement opportunities began in May 2012 with the Project announcement and are ongoing.

1.0 CONSULTATION AND ENGAGEMENT OVERVIEW: DRAFT PLAN DEVELOPMENT

Reports on activities completed between May 2012 and June 30, 2015 were filed with the NEB and are available in the Application (Volume 3A: Stakeholder and Volume 3B: Aboriginal; Filing ID [A55987](#)) as well as in Consultation Update No. 1 and Errata, Technical Update No. 1 (Filing ID [A59343](#)) / Consultation Update 2 (Filing IDs [A62087](#) and [A62088](#)), Consultation Update 3 (Filing IDs [A4H1W2](#) through [A4H1W8](#)) and Consultation Update 4 (Filing ID [A72224](#)). These reports the results of consultation conducted to June 30, 2015, identification of issues and concerns as well as Trans Mountain's response are included below. Where appropriate, Trans Mountain's response has been updated to reflect information developed since the original response was provided during the NEB proceeding for the Project.

Consultation and engagement activities completed between July 1, 2015 and February 2017 have not been filed on the public record with the NEB. Any new issues, concerns regarding mitigation measures identified during this period, as well as Trans Mountain's response, are also described below.

2.0 CONSULTATION AND ENGAGEMENT OVERVIEW: DRAFT PLAN

A draft of the updated WMT EPP was released on November 17, 2016 for review. Feedback was requested by February 24, 2017. Email or mail notification regarding the Plan was sent to 141 public stakeholders, 17 regulatory authorities, and 17 Aboriginal groups. The notification included a summary description of the Plan, a request for review, the timing of the comment period and contact information. Aboriginal groups were offered the opportunity for an in-person meeting to review the Plan. See Appendix F-1 for a complete list of notified stakeholders.

In addition to direct notification, the online posting of each Plan was promoted through Trans Mountain's weekly e-newsletter, Trans Mountain Today, which provides Project updates, regulatory information, stories and interviews to more than 6,000 subscribers. Each week Trans Mountain Today included a focus on a specific plan, or group of plans, as well as a reminder of all plans available for review.

2016:

- September 22 - Wildlife Mitigation and Habitat Restoration Plans;
- September 29 - Pipeline EPPs;
- October 6 - Air Quality Management Plans;
- October 13 - Watercourse and Water Ecosystems Plans;
- October 20 - Vegetation Management Plans;
- October 27 - Air Quality Plans;
- November 3 - Socio-Economic Effects Monitoring Plan;

- November 10 - Access Management Plan;
- December 22 - General promotion all plans; and
- December 29 - General promotion all plans.

2017:

- January 5 - General promotion all plans; and
- January 12 - General promotion all plans.

Trans Mountain is committed to ongoing engagement throughout the life of the Project. The start and end date for the review and comment period for each environmental management plan is defined. These timelines are required to allow time for preparation of the final Plan in order to meet regulatory requirements and NEB submission dates.

3.0 CONSULTATION AND ENGAGEMENT: ACTIVITIES AND FEEDBACK

Consultation and engagement activities completed with identified stakeholder groups are described below, including: public stakeholders and 17 Appropriate Government Authorities (Section 3.1); and Aboriginal groups (Section 3.2).

Feedback on the draft WMT EPP, Trans Mountain's response, and where each issue or concern is addressed in the WMT EPP has been outlined in each section according to stakeholder group.

3.1 Public and Appropriate Government Authority Consultation

3.1.1 Consultation Summary – May 2012 to June 2015

Feedback regarding mitigation measures in the WMT EPP received during public and Appropriate Government Authority consultation and engagement activities between May 2012 and June 30, 2015 is included in the Project Application.

3.1.2 New Interests, Issues, Concerns and Response – July 2015 to February 2017

Table F-1 includes new interests, issues and concerns, as well as Trans Mountain's response with respect to mitigation measures in the WMT EPP identified through public consultation and engagement activities between July 2015 and February 2017.

TABLE F-1

NEW INTERESTS, ISSUES, CONCERNS AND COMMON TRANS MOUNTAIN RESPONSES

Invited Stakeholder Group/Agency Name	Method of Contact	Date of Consultation Activity	Comments	Where Addressed
<ul style="list-style-type: none"> • Glorious Organic Co-Op* • Langley Environmental Partners Society * • Metro Vancouver Regional District * • BC Chicken Marketing Board * • City of Abbotsford * • Fraser Valley Regional District * • Agricultural Lands Commission * • Van Belle Nursery * • Invasive Species Council of BC * • BC Hot House • Fraser Valley Invasive Plant Council • BC Chicken Growers Association • University of the Fraser Valley • City of Chilliwack • BC Young Farmers Association • Whatcom Farm Friends • Whatcom Conservation District • Fraser Valley Indo Canadian Business Association • Abbotsford Agricultural Advisory Committee • Abbotsford Chamber of Commerce • Rosegate Dairy Farms • BC Greenhouse Growers Association • BC Landscape Nursery Association • BC Dairy Association • Certified Organic Association of BC • Ministry of Agriculture • Yarrow Eco Village • Clearbrook Waterworks District • BC Broiler Hatching Egg Producers Association • Langley Environmental Partners Society • BC Nursery Association • Fraser Valley Conservancy • Metro Vancouver Regional District • Township of Langley • BC MOE • BC Milk Marketing Board • Abbotsford Soil Conservation Association • Kato's Nursery • Delta Farmland and Wildlife Trust • Chilliwack Chamber of Commerce • BC Cranberry Growers Association • Clearview Horticulture 	<p>Abbotsford EPP Workshop</p>	<p>September 10, 2015</p>	<ul style="list-style-type: none"> • Request for TMEP to have independent (third-party) inspectors for environmental mitigation or reimbursement for local governments to hire third party inspectors 	<ul style="list-style-type: none"> • Trans Mountain's approach to environmental compliance, including environmental inspection and monitoring, is detailed in the CMP (Volume 10 of the Environmental Plans).

TABLE F-1 Cont'd

Invited Stakeholder Group/ Agency Name	Method of Contact	Date of Consultation Activity	Comments	Where Addressed
<ul style="list-style-type: none"> • Nicola Stock Breeder's Association* • Thompson Rivers University* • Southern Interior Weed Management Committee* • Ministry Forest Land Natural Resources Operations* • Kamloops Ministry of Environment* • Land Resource Management* • Fraser Basin Council* • Kamloops Naturalist Club* • City of Kamloops* • Tranquille Livestock Association • Kamloops Stockmen's Association • BC Wildlife Park • BC Conservation Federation • BC Parks • Department of Fisheries and Oceans • Ducks Unlimited • Nicola Naturalist Society • Freshwater Fisheries Society of BC • Thompson Okanagan – Trout Unlimited • Habitat Conservation Trust Foundation • Wells Grey World Heritage 	Kamloops EPP Workshop	September 15, 2015	<ul style="list-style-type: none"> • Request to involve independent experts in the identification of criteria for reclamation success. Concern includes addressing landowner disputes regarding full reclamation. 	<ul style="list-style-type: none"> • Trans Mountain's approach to reclamation and monitoring are discussed in the Reclamation Management Plan (Section 9.0 of Volume 6 of the Environmental Plans).
<ul style="list-style-type: none"> • VFPA 	Email	January 16, 2017	<p>Preliminary feedback on the draft WMT EPP referred to as the Construction Environmental Management Plan in the VFPA application contained within the Project description document submitted to the VFPA on December 6, 2016:</p> <ul style="list-style-type: none"> • Page 4-5 Additional dust mitigation: wheel wash if trucks are leaving the construction site and travelling on roads not subject to wash-down • Page 4-7 Weed control: Spraying is cited as an example of a weed growth control method. VFPA prefers that non-chemical means of weed control are used wherever feasible • Pages 4-8, 4-9 Marine sediment and water quality: Use only clean (washed, free of mud or other fines) rock for reef construction, and use sediment curtains for rock placement. 	<ul style="list-style-type: none"> • Feedback received has been incorporated into the WMT EPP as appropriate. See Sections 6.0, 7.0, and 8.0 of this EPP

TABLE F-1 Cont'd

Invited Stakeholder Group/ Agency Name	Method of Contact	Date of Consultation Activity	Comments	Where Addressed
<ul style="list-style-type: none"> VFPA (cont'd) 	See above	See above	<ul style="list-style-type: none"> Page 4-10 Marine fish and fish habitat: Reference to barge anchoring and spudding should include a prohibition of grounding (unless authorized by VFPA) Page 4-10 Marine mammals: Mitigations overlap with those for birds; suggest that mitigations for marine mammals not mention birds to minimize confusion Page 4-13 Marine birds: Similarly, mitigation measures probably shouldn't mention marine mammals Page 6-1 Tsunamis: The text mentions the existence in Indian Arm of a number of alluvial fans that were built up over time through the gradual deposition of sediments. In fact, debris flows do occur occasionally, which can result in the deposition of large amounts of material very rapidly. One such event occurred on the west shore of Indian Arm in recent memory, which resulted in significant damage to a boat club out-station and a migration of the alluvial fan-front outwards into deeper water. Such events, if large enough, could conceivably generate waves. However, we acknowledge that the discussion for landslides suggests that it is extremely unlikely that such waves could be large enough to cause damage away from the debris flow site. 	See above

TABLE F-1 Cont'd

Invited Stakeholder Group/ Agency Name	Method of Contact	Date of Consultation Activity	Comments	Where Addressed
<ul style="list-style-type: none"> Reed Point Marina Education Centre* 	WMT/BT Workshops	November 24, 2016	<ul style="list-style-type: none"> Golden star tunicate is a huge invasive on new construction (can manual scraping be used?) Get more knowledge on how to manage and maintain the combi-wall 	<ul style="list-style-type: none"> Intertidal biophysical surveys conducted within the existing water lot at the WMT in 2012 did not encounter the golden star tunicate. If the species is found to colonize the bulkhead wall, the tunicate may be removed by manual scraping, with little harm to surrounding fauna and algae. As per DFO's (2016) guidance, the tunicate can be frozen and then reported to DFO by providing the GPS location and date. The comment regarding obtaining more knowledge on the management and maintenance of the combi-wall (now a sheet-pile cell bulkhead wall) was related to methods for the control of this invasive species. Manual scraping following identification, as per DFO's guidance, is considered the least invasive method for management should the tunicate colonize the structure. Trans Mountain would seek the advice of DFO if colonization of the bulkhead wall by the golden star tunicate were to become an issue at the WMT.

TABLE F-1 Cont'd

Invited Stakeholder Group/ Agency Name	Method of Contact	Date of Consultation Activity	Comments	Where Addressed
<ul style="list-style-type: none"> Fraser Health Authority* 	WMT/BT Workshops	November 24, 2016	<ul style="list-style-type: none"> This would be a good time to do tissue sampling on fish species and you might be able to show that you are actually making an improvement to the environment (samples now vs. samples later) 	<ul style="list-style-type: none"> Trans Mountain does not anticipate that contamination of local waters and/or sediments will occur during construction or operation of the Project. As such, there is no rationale for undertaking comparative tissue sampling prior to and after fish habitat offsetting has occurred.

Note: * Attended EPP Workshop

3.2 Aboriginal Engagement

Since April 2012, Trans Mountain has engaged with Aboriginal communities that might have an interest in the Project or have Aboriginal interests potentially affected by the Project, based on the proximity of their community and their assertion of traditional and cultural use of the land along the pipeline corridor to maintain a traditional lifestyle. The objectives of Aboriginal engagement are to:

- have an open, transparent and inclusive process that seeks to exchange information in a respectful manner;
- address concerns shared by those who might have an interest in the Project or have Aboriginal interests potentially affected by the Project;
- incorporate feedback into Project planning and execution; and
- provide opportunities to maximize Project benefits to Aboriginal communities and Aboriginal groups.

A comprehensive Aboriginal engagement process is lead by experienced engagement advisors in Alberta and BC, specialized in the areas of Aboriginal relations, law, economic development, education, training, employment and procurement. Trans Mountain's engagement process for the Project is flexible, allowing each community and group to engage in meaningful dialogue in the manner they choose and in a way to meet their objectives and values.

Each community had the opportunity to engage with Trans Mountain, depending on Project interests and potential effects. The following opportunities to engage have been provided:

- Project announcement;
- initial contact with Aboriginal community or Aboriginal group;
- meetings with Chief and Council and meetings with staff;
- host community information session(s);
- conduct TLU studies and socio-economic interviews;

- identify interests and concerns; and
- identify mitigation options.

Issues and concerns related to the WMT EPP raised during Aboriginal engagement from between early 2012 to February 2017 are summarized in Table F-2.

TABLE F-2
SUMMARY OF ABORIGINAL CONCERNS REGARDING THE WMT EPP

Issue or Concern		Summary Trans Mountain Response	Where Addressed
Summary	Aboriginal Community		
Concerns regarding the effects of 24-hour lighting on migratory birds and on fish, such as herring, which may come to the surface at night becoming more susceptible to artificial prey opportunities and less available to traditional fishing practices that use light as an attractant.	Lyackson First Nation	<p>Trans Mountain will implement the following mitigation measures pertaining to lighting that are provided in Section 6.0 of the WMT EPP (Volume 4 of the Environmental Plans):</p> <ul style="list-style-type: none"> • Design lighting requirements at the WMT to meet the <i>Canada Occupational Health and Safety Regulations</i> and the <i>International Ship and Port Facility Security Code</i> (for compliance), for worker safety and terminal security during construction, while minimizing environmental and socio-economic effects. Refer to the Lighting Emissions Management Plan for the WMT (NEB Condition 82). • Where feasible, prevent sky-lighting which may lead to bird disorientation and/or collisions by: using low level and low intensity lighting; using no lighting in areas where no work is planned; using downturned shaded fixtures in light standards; and using a higher lumen/watt (light out to power in) ratio, such as metal halide lighting. • During migratory bird periods and/or during extreme weather events, bird strike warnings will be issued to marine construction vessels with a request to reduce deck lighting. • Install lighting control systems in the facility site that permit the reduction of the amount of lighting during periods of low activity. • Use lighting in the yellow spectrum, where feasible, to reduce disruption to nocturnal fish activities and bird strikes. <p>NEB Condition 82 (Light Emissions Management Plan for the WMT) requires Trans Mountain to file with the NEB, at least three months prior to commencing construction at the WMT, a Light Emissions Management Plan for the WMT that includes a description of the mitigation and best practice measures considered for the terminal lighting design and how the proposed design and operation will minimize the impacts from light on land-based residents and marine users.</p>	<p>Section 6.0 of the WMT EPP (Volume 4 of the Environmental Plans)</p> <p>NEB Condition 82 (Light Emissions Management Plan for the WMT)</p>
Potential for seismic activity (e.g., earthquake) leading to equipment failure at the WMT resulting in pollution and damage of resources used by Aboriginal groups.	Lyackson First Nation Squamish First Nation Stz'uminus First Nation	<p>NEB Condition 68 (Seismic Reports – Liquefaction Potential) requires Trans Mountain to file with the NEB, at least three months prior to commencing construction, a final report that identifies all sites along the Project, that have “Very High,” “High,” and “Moderate” liquefaction-triggered ground movement potential, and that describes how the potential for liquefaction-triggered ground movement will be mitigated at each site.</p> <p>NEB Condition 69 (Fault Studies) requires Trans Mountain to file with the NEB, at least three months prior to commencing construction, the results of fault-mapping studies that were ongoing during or undertaken after the OH-001-2014 proceeding, for use in the detailed design of the Project. This filing must include conclusions regarding possible seismic activity during the Holocene epoch for Sumas Fault, Vedder Mountain Fault, Fraser River-Straight Creek Fault and Rocky Mountain Trench, and other possible hidden faults, as well as the potential for compounding risks due to the proximity of the Vedder Mountain and Sumas Faults.</p>	<p>NEB Condition 68 (Seismic Reports – Liquefaction Potential)</p> <p>NEB Condition 69 (Fault Studies)</p>
Effects of dredging around the WMT on fish and fish habitat, including resuspension of sediments.	Squamish Nation	In the event that dredging is determined to be required, Trans Mountain will implement the Water Quality Management Plan During Rip Rap Removal (Appendix H of this EPP).	Section 8.0 of the WMT EPP (Volume 4 of the Environmental Plans)

TABLE F-2 Cont'd

Issue or Concern		Summary Trans Mountain Response	Where Addressed
Rehabilitation efforts in Burrard Inlet will be undermined by the Project.	Squamish Nation	Mitigation measures to avoid or reduce potential adverse environmental effects associated with the marine component of the WMT construction activities (including in-water excavation of existing rip- rap; installation of sheet piles and king piles associated with the foreshore extension; installation of cylindrical pipe piles for the marine trestle and berths; and overwater construction of dock infrastructure) are provided in Section 8.0 of the WMT EPP (Volume 4 of the Environmental Plans).	Section 8.0 of the WMT EPP (Volume 4 of the Environmental Plans)
Achievement of the objectives of the Marine Stewardship Program will be slowed or denied.	Tsleil-Waututh Nation		
Ability to harvest resources near the WMT will be affected, including the ability to harvest at preferred harvesting locations.	Tsleil-Waututh Nation	Mitigation measures to avoid or reduce potential adverse environmental effects associated with the marine component of the WMT construction activities (including in-water excavation of existing rip- rap; installation of sheet piles and king piles associated with the foreshore extension; installation of cylindrical pipe piles for the marine trestle and berths; and overwater construction of dock infrastructure) are provided in Section 8.0 of the WMT EPP (Volume 4 of the Environmental Plans).	Section 8.0 of the WMT EPP (Volume 4 of the Environmental Plans)
Decreased opportunities to eat safe and abundant wild foods from Burrard Inlet.	Tsleil-Waututh Nation		

Trans Mountain continues to liaise with Indigenous and Northern Affairs Canada, the Government of Canada's Major Projects Management Office, the BC Ministry of Aboriginal Relations and Reconciliation, and the Alberta Ministry of Aboriginal Affairs to provide updates regarding Trans Mountain's engagement activities with Aboriginal groups.

3.2.1 Identifying Aboriginal Groups for Consultation

Trans Mountain used the First Nations Consultative Area Database Public Map Service to identify the Aboriginal groups with traditional territories encountered by the Project. Appendix G lists the Aboriginal groups identified for consultation.

3.2.2 Consultation Activities

A letter was sent in November 2016 to the Aboriginal groups listed in Appendix G with a copy of the draft EPP. Where appropriate and upon request, a follow-up meeting was arranged to discuss this EPP in more detail and address any concerns.

No feedback on the draft WMT EPP was received. It should be noted that although the engagement process also provided for opportunity for general discussion about Project construction and associated Aboriginal issues and opportunities, only feedback/issues directly related to construction mitigation measures will be provided in this EPP. Other issues and topics raised have been captured in the corresponding mitigation plan as appropriate.

This final WMT EPP will be shared with the Aboriginal groups at the same time as it is filed with the NEB in 2017.

APPENDIX F-1

RECORD OF STAKEHOLDER NOTIFICATIONS OF PLAN

Records of stakeholder notifications can be found in Table F1-1 below.

TABLE F1-1

RECORD OF NOTIFICATION

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Landowners	N/A	September 11, 2016	Letter
Aboriginal Groups	N/A	November 2016	Letter
VFPA	Tim Blair	December 22, 2016	Email
Jasper National Park of Canada	Mayabe Dia	December 22, 2016	Email
Alberta Environment and Parks	Corinee Kristensen	December 22, 2016	Email
Ministry of Transportation and Infrastructure	Lisa Gow	December 22, 2016	Email
BC Parks	Ken Morrison	December 22, 2016	Email
BC OGC	Brian Murphy	December 22, 2016	Email
Ministry of Natural Gas Development	Linda Beltrano	December 22, 2016	Email
BC MFLNRO	Andrea Mah	December 22, 2016	Email
BC MFLNRO	Susan Fitton	December 22, 2016	Email
FVAQC	Roger Quan	October 21, 2016	Email
ECCC	Phil Wong	October 21, 2016	Email
ECCC	Rachel Mayberry	October 28, 2016	Email
ECCC	Coral Deshield	December 21, 2016	Email
ECCC	Phil Wong	December 21, 2016	Email
VFPA	Patrick Coates	January 31, 2017	Email
DFO	Sandra Hollick-Kenyon	December 3, 2016	Email
DFO	Alston Bonamis	December 3, 2016	Email
City of Edmonton	N/A	November 29, 2016	Letter
City of Spruce Grove	N/A	November 29, 2016	Letter
Municipality of Jasper	N/A	November 29, 2016	Letter
Parkland County	N/A	November 29, 2016	Letter
Strathcona County	N/A	November 29, 2016	Letter
Town of Edson	N/A	November 29, 2016	Letter
Town of Hinton	N/A	November 29, 2016	Letter
Town of Stony Plain	N/A	November 29, 2016	Letter
Village of Wabamun	N/A	November 29, 2016	Letter
Yellowhead County	N/A	November 29, 2016	Letter
City of Kamloops	N/A	November 29, 2016	Letter
City of Kamloops RCMP Detachment	N/A	November 29, 2016	Letter
City of Merritt	N/A	November 29, 2016	Letter
City of Merritt RCMP Detachment	N/A	November 29, 2016	Letter
Clearwater Chamber of Commerce	N/A	November 29, 2016	Letter
District of Clearwater	N/A	November 29, 2016	Letter
District of Clearwater RCMP Detachment	N/A	November 29, 2016	Letter
Interior Health	N/A	November 29, 2016	Letter
Merritt Chamber of Commerce	N/A	November 29, 2016	Letter
Northern Health	N/A	November 29, 2016	Letter
Regional District of Fraser Fort George	N/A	November 29, 2016	Letter
Thompson Nicola Regional District	N/A	November 29, 2016	Letter
Town of Blue River	N/A	November 29, 2016	Letter

TABLE F1-1 Cont'd

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Venture Kamloops	N/A	November 29, 2016	Letter
Village of Valemount	N/A	November 29, 2016	Letter
Village of Valemount RCMP Detachment	N/A	November 29, 2016	Letter
Nicola Stock Breeder's Association - on behalf of the BC Cattlemen's Association	N/A	November 29, 2016	Letter
Grassland's Conservation Council	N/A	November 29, 2016	Letter
Thompson Rivers University	N/A	November 29, 2016	Letter
Southern Interior Weed Management Committee	N/A	November 29, 2016	Letter
Fraser Basin Council	N/A	November 29, 2016	Letter
Northwest Invasive Plant Council	N/A	November 29, 2016	Letter
Grassland's Conservation Council	N/A	November 29, 2016	Letter
Abbotsford Chamber of Commerce	N/A	November 29, 2016	Letter
Abbotsford Police Department	N/A	November 29, 2016	Letter
ASCA	N/A	November 29, 2016	Letter
BC Invasive Species	N/A	November 29, 2016	Letter
BC Ministry of Children and Family Development	N/A	November 29, 2016	Letter
BC Ministry of Social Development	N/A	November 29, 2016	Letter
BC Nature	N/A	November 29, 2016	Letter
BC Wildlife Federation	N/A	November 29, 2016	Letter
Burnaby Board of Trade	N/A	November 29, 2016	Letter
Burnaby RCMP Detachment	N/A	November 29, 2016	Letter
Chilliwack Chamber of Commerce	N/A	November 29, 2016	Letter
Chilliwack Economic Partners	N/A	November 29, 2016	Letter
City of Abbotsford	N/A	November 29, 2016	Letter
City of Burnaby	N/A	November 29, 2016	Letter
City of Chilliwack	N/A	November 29, 2016	Letter
City of Coquitlam	N/A	November 29, 2016	Letter
City of New Westminster	N/A	November 29, 2016	Letter
City of Port Coquitlam	N/A	November 29, 2016	Letter
City of Port Moody	N/A	November 29, 2016	Letter
City of Surrey	N/A	November 29, 2016	Letter
Coquitlam RCMP Detachment	N/A	November 29, 2016	Letter
Corporation of Delta	N/A	November 29, 2016	Letter
District of Hope	N/A	November 29, 2016	Letter
Eagle Creek	N/A	November 29, 2016	Letter
Fraser Valley Invasive Plant Council	N/A	November 29, 2016	Letter
Fraser Valley Regional District	N/A	November 29, 2016	Letter
Glen Valley Watershed Society	N/A	November 29, 2016	Letter
Hope Chamber of Commerce	N/A	November 29, 2016	Letter
Hope Community Policing Office	N/A	November 29, 2016	Letter
Langley Chamber of Commerce	N/A	November 29, 2016	Letter
LEPS	N/A	November 29, 2016	Letter
LFVAQCC	N/A	November 29, 2016	Letter
Metro Vancouver	N/A	November 29, 2016	Letter
Newton RCMP Detachment	N/A	November 29, 2016	Letter
RCMP Division 'E'	N/A	November 29, 2016	Letter
Sapperton Fish and Game	N/A	November 29, 2016	Letter
Stoney Creek	N/A	November 29, 2016	Letter
Surrey Board of Trade	N/A	November 29, 2016	Letter
Surry Environmental Partners	N/A	November 29, 2016	Letter

TABLE F1-1 Cont'd

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Surrey RCMP Detachment	N/A	November 29, 2016	Letter
Township of Langley	N/A	November 29, 2016	Letter
Township of Langley RCMP Detachment	N/A	November 29, 2016	Letter
TriCities Chamber of Commerce	N/A	November 29, 2016	Letter
Upper Fraser Valley Regional Detachment	N/A	November 29, 2016	Letter
Village of Anmore	N/A	November 29, 2016	Letter
Village of Belcarra	N/A	November 29, 2016	Letter
Yorkson	N/A	November 29, 2016	Letter
ACGI Shipping	N/A	November 29, 2016	Letter
Barnett Marine Park	N/A	November 29, 2016	Letter
BC Ambulance	N/A	November 29, 2016	Letter
BC Chamber of Shipping	N/A	November 29, 2016	Letter
BC Coast Pilots	N/A	November 29, 2016	Letter
BROKE (Burnaby Residents Opposed to Kinder Morgan Expansion)	N/A	November 29, 2016	Letter
Canadian Pacific (CP) Rail	N/A	November 29, 2016	Letter
Canexus- Ero- Newalta-Univar Community Advisory Panel	N/A	November 29, 2016	Letter
Canexus Chemicals	N/A	November 29, 2016	Letter
Chevron	N/A	November 29, 2016	Letter
CN Rail	N/A	November 29, 2016	Letter
Council of Marine Carriers	N/A	November 29, 2016	Letter
District of North Vancouver	N/A	November 29, 2016	Letter
Empire Shipping	N/A	November 29, 2016	Letter
Erco Worldwide	N/A	November 29, 2016	Letter
First Nation Emergency Services Society	N/A	November 29, 2016	Letter
First Nation Health Authority	N/A	November 29, 2016	Letter
Fraser Health Authority	N/A	November 29, 2016	Letter
Inchcape Shipping	N/A	November 29, 2016	Letter
Island Tug and Barge	N/A	November 29, 2016	Letter
Kask Brothers	N/A	November 29, 2016	Letter
Ledcor Resources and Transportation Limited Partnership	N/A	November 29, 2016	Letter
Mason Agency (Shipping Service)	N/A	November 29, 2016	Letter
MLA- Burnaby Lougheed	N/A	November 29, 2016	Letter
MLA- Burnaby North	N/A	November 29, 2016	Letter
MLA- Coquitlam – Burke Mountain	N/A	November 29, 2016	Letter
MLA- North Vancouver Lonsdale	N/A	November 29, 2016	Letter
MLA- North Vancouver Seymour	N/A	November 29, 2016	Letter
MLA- Port Moody- Coquitlam	N/A	November 29, 2016	Letter
MP- Delta	N/A	November 29, 2016	Letter
MP- North Burnaby Seymour	N/A	November 29, 2016	Letter
MP- North Vancouver	N/A	November 29, 2016	Letter
MP- Vancouver Centre	N/A	November 29, 2016	Letter
MP- Vancouver East	N/A	November 29, 2016	Letter
MP- Vancouver Quadra	N/A	November 29, 2016	Letter
MP- West Vancouver – Sunshine Coast – Sea to Sky Country	N/A	November 29, 2016	Letter
North Shore NOPE	N/A	November 29, 2016	Letter
North Vancouver Chamber of Commerce	N/A	November 29, 2016	Letter

TABLE F1-1 Cont'd

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Pacific Coast Terminal	N/A	November 29, 2016	Letter
Pacific Pilotage Authority	N/A	November 29, 2016	Letter
Pacific Wildlife Foundation	N/A	November 29, 2016	Letter
Peter Kiewit Infrastructure Co.	N/A	November 29, 2016	Letter
Seaspan	N/A	November 29, 2016	Letter
Shell Terminal	N/A	November 29, 2016	Letter
Simon Fraser University	N/A	November 29, 2016	Letter
SMIT Marine	N/A	November 29, 2016	Letter
Suncor Terminal	N/A	November 29, 2016	Letter
UBC Stellar Sea Lion (Marine Mammal) Research Centre	N/A	November 29, 2016	Letter
Vancouver Aquarium	N/A	November 29, 2016	Letter
Vancouver Board of Trade	N/A	November 29, 2016	Letter
Vancouver Coastal Health Authority	N/A	November 29, 2016	Letter
Vancouver Pile and Dredge	N/A	November 29, 2016	Letter
West Vancouver Chamber of Commerce	N/A	November 29, 2016	Letter
Westward Shipping	N/A	November 29, 2016	Letter
Wild Bird Trust	N/A	November 29, 2016	Letter
Metro Vancouver Regional District	Ali Ergudenler	November 29, 2016	Email
Metro Vancouver Regional District	Roger Quan	November 29, 2016	Email

APPENDIX G

ABORIGINAL GROUPS ENGAGED ON THE WESTRIDGE MARINE TERMINAL ENVIRONMENTAL PROTECTION PLAN

- Aitchelitz First Nation (Stó:lō)
- Cowichan Tribes
- Halalt First Nation (CNA)
- Kwikwetlem First Nation
- Lake Cowichan First Nation
- Leq'a:mel First Nation (Stó:lō)
- Lyackson First Nation
- Musqueam Indian Band
- Penelakut First Nation
- Popkum First Nation (Stó:lō)
- Skawahlook First Nation (Stó:lō)
- Skowkale First Nation (Stó:lō)
- Squamish Nation
- Stu'zuminus First Nation (Chemainus)
- Tseil-Waututh Nation
- Tzeachten First Nation (Stó:lō)
- Yakwekwioose Band (Stó:lō)

APPENDIX H

MARINE WATER QUALITY MANAGEMENT PLAN DURING RIP RAP REMOVAL

 Stantec	Trans Mountain Expansion Project Marine Water Quality Management During Rip Rap Removal Plan	Contractor Revision Date:	2017-08-17
		Contractor Revision No.:	Rev 2
		Page	1 of 24



Trans Mountain Expansion Project

MARINE WATER QUALITY MANAGEMENT PLAN DURING RIP RAP REMOVAL

KMC Document # 01-13283-TW-WT00-MD-RPT-0014 R1

Rev No.	Prepared by/ Date	Reviewed by/ Date	Approved by/ Date	TMEP Acceptance/ Date	Pages Revised	Issued Type
1	Barrie Tuite/Steve Murton 2017-08-16	Karen Munro 2017-08-16	Steve Murton 2017-08-16			Issued for Information
0	Barrie Tuite/Steve Murton 2017-05-10	Karen Munro 2017-05-10	Steve Murton 2017-05-10		All	Issued for TM legal review
A	Stantec Consulting 2017-04-07	Stefan Dick 2017-04-11	Karen Munro 2017-04-11			Issued for Trans Mountain Review



MARINE WATER QUALITY MANAGEMENT PLAN DURING RIP RAP REMOVAL FOR THE TRANS MOUNTAIN PIPELINE ULC TRANS MOUNTAIN EXPANSION PROJECT

August 2017

KMC Doc No.: 01-13283-TW-WT00-MD-RPT-0014 R1

Prepared for:



TRANSMOUNTAIN

Trans Mountain Pipeline ULC

Kinder Morgan Canada Inc.
Suite 2700, 300 – 5th Avenue S.W.
Calgary, Alberta T2P 5J2
Ph: 403-514-6400

Table of Contents

1.0	Introduction.....	1
1.1	Objectives and Measurable Goals.....	1
1.2	Links to other Trans Mountain Environmental Plans	1
1.3	Commitments Management.....	2
1.4	Regulatory Guidance.....	2
2.0	Consultation and Engagement.....	3
3.0	Description of Rip Rap Removal Activity	3
4.0	Existing Marine Sediment Conditions	5
5.0	Mitigation Measures	5
6.0	Monitoring Measures	5
7.0	Conclusion.....	8
8.0	References	8

APPENDICES

Appendix A.....	Consultation and Engagement
Appendix B.....	Record of Stakeholder Notifications of Plan

LIST OF TABLES

Table 1	Trans Mountain Plans Linked to this Plan	2
---------	--	---

LIST OF FIGURES

Figure 1	Proposed Rip Rap Removal Area and Example Monitoring Stations.....	4
Figure 2	Decision Tree for Turbidity Monitoring During Rip Rap Removal	7

1.0 INTRODUCTION

Trans Mountain Pipeline ULC (Trans Mountain) submitted a Facilities Application (the Application) to the National Energy Board (NEB) in December 2013 for the proposed Trans Mountain Expansion Project (“the Project” or “TMEP”). A Certificate of Public Convenience and Necessity allowing the Project to proceed, subject to 157 Conditions, was issued on December 1, 2016. The Project involves expansion of the existing Westridge Marine Terminal (WMT) and construction of a new dock complex. The Project will require removal of intertidal and subtidal rip rap along the shoreline of the existing WMT. Although no dredging will be required, removal of rip rap is likely to disturb some marine sediment, elevating turbidity in the surrounding water. Contaminants potentially present in sediment may also be mobilized during rip rap removal.

This Marine Water Quality Management Plan During Rip Rap Removal (Plan) provides details on the proposed in-water excavation of rip rap at the WMT and describes the mitigation and monitoring measures that will be implemented to protect marine water quality. This Plan was originally released as the Marine Sediment Management Plan (NEB Condition 35), which was submitted to Appropriate Government Authorities and potentially affected Aboriginal groups on November 22, 2016 for review and feedback. Once the decision was made that dredging was not necessary at the WMT, the draft Marine Sediment Management Plan was no longer required. However, since the draft Marine Sediment Management Plan did discuss the in-water excavation of rip rap and the proposed associated mitigation measures, the relevant content was retained, along with any feedback received during consultation, and the Plan renamed. The Plan now forms an appendix to the Westridge Environmental Protection Plan (NEB Condition 81).

Since the November 22, 2016 release of the draft Marine Sediment Management Plan, engineering design has continued to progress and there have been changes, as detailed in TMEP Fall 2016 Project Updates (www.transmountain.com/environmental-plans). All of the changes have been reviewed, and the relevant Project design updates have been incorporated into this Plan. This Plan was also updated to reflect the change in the foreshore design from a combi-wall to sheet pile cells.

1.1 Objectives and Measurable Goals

The objective of this Plan is to describe the mitigation and monitoring measures that will be implemented to protect marine water quality during in-water excavation of rip rap at the WMT. The measurable goals are based on the federal and provincial water quality guidelines provided in Section 1.4.

1.2 Links to other Trans Mountain Environmental Plans

Information from other environmental plans prepared for the Project that are related to marine water quality has been considered in this Plan. The links between this Marine Water Quality Management Plan During Rip Rap Removal and other Trans Mountain plans are provided in Table 1.

Table 1 Trans Mountain Plans Linked to this Plan

Environmental Plan	Description of the Environmental Plan	Linkage to this Plan
Westridge Marine Terminal EPP (NEB Condition 81, Volume 4 of the Environmental Plans)	The Westridge Marine Terminal EPP contains Trans Mountain’s environmental procedures and mitigation measures to be implemented during construction of the Westridge Marine Terminal to avoid, reduce or mitigate potential adverse environmental effects.	The EPP includes general mitigation measures related to waste disposal and to working in or near water.

1.3 Commitments Management

Trans Mountain made a number of commitments regarding the Project during the OH-001-2014 proceedings and engagement activities up to May 2016. Commitments were made to improve and optimize Project planning and mitigation measures. As Trans Mountain has consolidated its commitments into a Commitments Tracking Table in accordance with NEB Condition 6, the Table of Commitments in each plan has been removed. Information Requests (IRs) and engagement activities that raised discussion, but did not result in a commitment, are not included in the Commitments Tracking Table.

The Commitments Tracking Table has been filed with the NEB and is available on Trans Mountain’s web site at www.transmountain.com. Trans Mountain continues to monitor and track compliance with its commitments and will update, post to its website and file with the NEB updated versions of the Commitments Tracking Table according to the timeframes outlined in NEB Condition 6. Commitments with specific relevance to this Plan have been considered and addressed.

1.4 Regulatory Guidance

The Water Protection and Sustainability Branch of the British Columbia (BC) Ministry of the Environment & Climate Change Strategy (MOECCS) sets turbidity guidelines for the protection of aquatic life in British Columbia (BC MOECCS 2017). The federal Canadian Council of Ministers of the Environment (CCME) also sets water quality guidelines for turbidity (CCME 2017), which are the same for clear flow and clear water and slightly different for high flow and turbid water. Because it is not practical to measure total suspended solids (TSS) in real-time (due to turnaround time at an analytical laboratory), it is common practice to monitor turbidity during construction activities. The turbidity guideline for freshwater, marine and estuarine habitats (measured in nephelometric turbidity units, or NTU) is as follows:

- Change from background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters (BC MOECCS and CCME)
- Change from background of 2 NTU at any one time for a duration of 30 days in all waters during clear flows or in clear waters (BC MOECCS and CCME)
- Change from background of 5 NTU at any time when background is 8–50 NTU during high flows or in turbid waters. Change from background of 10% when background is greater than 50 NTU at any time during high flows or in turbid waters (BC MOECCS)
- Maximum increase of 8 NTU from background levels at any one time when background levels are between 8 and 80 NTU. Should not increase more than 10% of background levels when background is greater than 80 NTU (CCME)

The monitoring program employed during marine excavation will use the BC MOECCS turbidity guidelines as a management goal for water outside (i.e., seaward) of the turbidity curtains during rip rap removal. Water quality within the active work area will exceed these guidelines but will be isolated from the rest of Burrard Inlet by the turbidity curtain (see Section 5.0).

2.0 CONSULTATION AND ENGAGEMENT

Consultation and engagement activities related to marine water and sediment quality were conducted between May 2012 and February 2017 with Appropriate Government Authorities and potentially affected Aboriginal groups. Opportunities to discuss marine water and sediment quality and identify issues or concerns were provided to public stakeholders through the Trans Mountain website, workshops, meetings, and ongoing engagement activities during the reporting period. Appendix A includes a comprehensive record of these engagement activities, stakeholder feedback and Trans Mountain responses.

Engineering design changes were issued in the TMEP Fall 2016 Project Update document (www.transmountain.com/environmental-plans), along with a request for feedback. All of the design updates up to April 1, 2017 have been reviewed, and the Project design updates that are relevant have been incorporated into this Plan.

3.0 DESCRIPTION OF RIP RAP REMOVAL ACTIVITY

The foreshore extension at the WMT will require the excavation of approximately 24,000 m³ of rip rap (rock material) along the shoreline, in intertidal and shallow subtidal areas. The rip rap will be removed from a total area of approximately 8,800 m² to allow for the installation of sheet pile cells (Figure 1). Removal of the existing rip rap will also be required to allow for ground improvements to be made within the sheet pile cells. The rip rap will be removed using a combination of a barge-mounted crane with an orange peel bucket and a shore-based excavator. The excavated rock material will be disposed of on land at an offsite location, or reused for construction of marine fish habitat offsets (i.e., artificial rock reefs) if the material does not require costly storage, rehandling and sorting and if approval is granted by Fisheries and Oceans Canada (DFO) and the Vancouver Fraser Port Authority.

10094_sediment_fig_01_01_construction_area_and_monitoring_stns.mxd



FIGURE: 1

PROPOSED RIP RAP REMOVAL AREA AND EXAMPLE OF PROPOSED WATER QUALITY MONITORING STATIONS AT THE WESTRIDGE MARINE TERMINAL

MARINE WATER QUALITY MANAGEMENT PLAN DURING RIP RAP REMOVAL

TRANS MOUNTAIN EXPANSION PROJECT

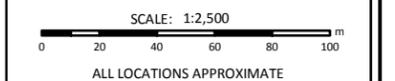
- Bathymetry (m CD)
- Containment Boom
- Primary Turbidity Curtain
- Secondary Turbidity Curtain
- Rip Rap Removal Area
- Water Quality Monitoring Station 30 m from Silt Curtain
- Water Quality Monitoring Station 100 m from Silt Curtain

This document is provided by Kinder Morgan Canada Inc. (KMC) for use by the intended recipient only. This information is confidential and proprietary to KMC and is not to be provided to any other recipient without the written consent of KMC. It is not to be used for legal, engineering or surveying purposes, nor for doing any work on or around KMC's pipelines and facilities, all of which require KMC's prior written approval.

Projection: NAD 83 UTM Zone 10N; Satellite Imagery: I-cubed, 2010; Bathymetry: Canadian Hydrographic Service, 2011; Existing and Proposed Westridge Water Lease: Moffatt & Nichol, 2012; Footprint (Marine): CH2M Hill, 2014; Fill Slope of Land Reclamation: CH2M Hill, 2014; Land Reclamation: CH2M Hill, 2014.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

MAP NUMBER 10494_SEDIMENT_FIG_01_01	PAGE SHEET 1 OF 1
DATE May 2017	REVISION 0
SCALE 1:2,500	DISCIPLINE SD
DRAWN SS	DESIGN BT



4.0 EXISTING MARINE SEDIMENT CONDITIONS

Although no dredging of soft sediment will be required at the WMT, in-water excavation of rip rap is expected to disturb existing sediments. This will result in elevated turbidity in the surrounding water, and may result in the resuspension of existing contaminants. Information on existing marine sediment conditions at the WMT is provided in the Project's Environmental and Socio-Economic Assessment (Volume 5A, Section 7.6.8; and Volume 5C-12 – *Marine Sediment and Water Quality: Westridge Marine Terminal Technical Report*). This includes data from a subtidal sediment sampling program conducted in May 2013, as well as data from past studies in the area. Additional sediment sampling to characterize sediment in and adjacent to the area of rip rap removal was conducted in October 2014 and November 2016. The sampling programs showed that levels of cadmium and lead were higher than the disposal at sea screening criteria in the top 0.5 m of sediment in isolated locations. Levels of copper were higher than the screening criteria down to 2.5 m depth in core samples, suggesting naturally elevated levels. Arsenic levels were above screening criteria down to 2 m depth at the existing berth, suggesting naturally elevated levels; however, concentrations were not elevated near the foreshore. Levels higher than the screening criteria were noted for polycyclic aromatic hydrocarbons (PAHs), primarily in some surface samples but also in isolated core samples to 0.5 m depth (up to 14.5 mg/kg total PAH, compared to disposal at sea screening criterion of 2.5 mg/kg).

5.0 MITIGATION MEASURES

The following mitigation measures will be implemented to protect marine water quality and reduce potential effects to marine life during in-water excavation of rip rap.

- In-water excavation of rip rap will be conducted during a timing window between August 16 and March 15. The expected duration of the rip rap removal if completed in a continuous manner is approximately one month. This scheduling will reduce potential exposure of sensitive species and life stages to elevated levels of suspended sediment.
- A turbidity curtain will be deployed around the work area to limit the spatial extent of elevated levels of suspended sediment. Turbidity curtains are effective in shallow depth, low current conditions, such as those found at the WMT. The turbidity curtain will be secured with a system of anchors, buoys and a weighted chain, and will extend around the entire work area where excavation will occur (Figure 1). If a barge is required for removal of the excavated material, this vessel will be contained within a separate turbidity curtain outside the in-water works area (Figure 1). This approach will allow passage of the barge to and from the site without opening the turbidity curtain surrounding the work site.

6.0 MONITORING MEASURES

Water quality will be monitored outside of the turbidity curtain during in-water excavation of rip rap. Turbidity levels will be measured outside of the turbidity curtain to determine the effectiveness of the curtain at containing suspended sediments. Results will be compared to the BC MOECCS turbidity guidelines for the protection of aquatic life.

The preliminary monitoring plan is as follows:

- Sample 10 monitoring sites in an arc 30 m from the turbidity curtain
- Sample an additional 10 monitoring sites in an arc 100 m from the turbidity curtain
- Collect water samples at the surface at all sites and 2 m from bottom at deeper sites (i.e., greater than 5 m depth)

- Collect samples a minimum of two times per day during the first week of work: prior to start-up and mid-morning, prioritizing test locations directly across from the rip rap removal location and in reference areas
- Collect samples every second day at the same two times of day when the onsite-spatial and temporal variations in water quality are well-understood, from the second week of work until completion. The number of monitoring locations will be adjusted based on initial findings and site conditions.

Background conditions, for comparison to the BC MOECCS turbidity guideline, will be established in two ways. The samples taken prior to start-up each day will reflect undisturbed conditions in Burrard Inlet, as will samples taken 100 m away on the up-current side of the excavation activity (depending on direction of tidal currents). The number and location of sampling sites is preliminary and may require refinement based on final construction methods and site conditions. Additional samples may be required to confirm the effectiveness of water quality mitigation measures, or to identify the need to adjust construction activities.

The monitoring sites will move if the turbidity curtain is moved. Figure 1 shows an example of sampling site locations. If water quality guideline exceedances are detected outside the turbidity curtains, the Water Quality Monitor will inform the excavation Contractor. Depending on the duration, extent, and magnitude of the exceedance, a temporary halt or adjustment to the excavation activity will be considered.

A decision tree for turbidity monitoring that refers to thresholds from the BC MOECCS turbidity guideline and identifies corrective actions to be implemented if a threshold is exceeded is provided in Figure 2.

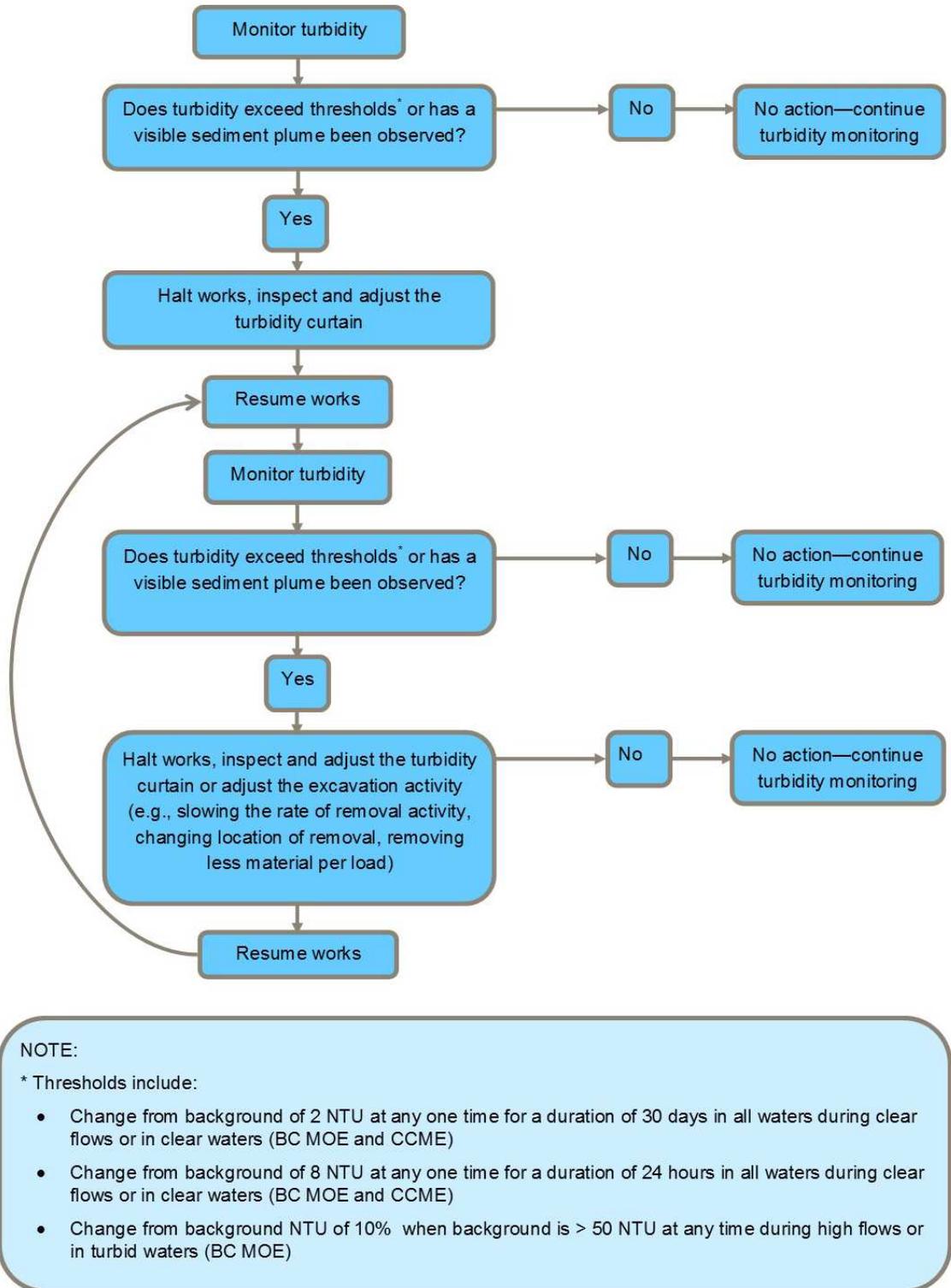


Figure 2 Decision Tree for Turbidity Monitoring During Rip Rap Removal

7.0 CONCLUSION

The mitigation measures outlined in this Plan are industry standards with a well-established record of effective use. As such, they are expected to successfully mitigate the effects of in-water excavation of rip rap on marine water quality, and reduce potential effects to marine life.

Measures to reduce the residual effects of in-water excavation of rip rap on marine water quality have been implemented during Project planning and will continue through the remaining phases of the Project with guidance from relevant government policies and management objectives and consultation.

8.0 REFERENCES

British Columbia Ministry of Environment. 2016. British Columbia Ambient Water Quality Guidelines for Turbidity. Website: <http://www.env.gov.bc.ca/wat/wq/BCguidelines/turbidity/turbidity.html>. Accessed: November 2016.

Canadian Council of Ministers of the Environment. Water Quality for the Protection of Aquatic Life. Website: http://st-ts.ccme.ca/en/index.html?lang=en&factsheet=218#aql_marine_concentration. Accessed: March 2017.

APPENDIX A

CONSULTATION AND ENGAGEMENT

Consultation and engagement activities related to marine water and sediment quality were completed with Appropriate Government Authorities and potentially affected Aboriginal groups. Opportunities to discuss marine water and sediment quality and identify issues or concerns were also provided to public stakeholders during meetings, workshops and ongoing engagement activities.

Consultation and engagement opportunities began in May 2012 with the Project announcement and are ongoing.

1.0 Consultation and Engagement Overview: Draft Plan Development

Reports on public consultation activities completed between May 2012 and June 30, 2015 were filed with the National Energy Board (NEB) and are available in the Application (Volume 3A: Stakeholder and Volume 3B: Aboriginal; Filing ID [A55987](#)) as well as in Consultation Update No. 1 and Errata, Technical Update No. 1 (Filing ID [A59343](#)) / Consultation Update 2 (Filing IDs [A62087](#) and [A62088](#)), Consultation Update 3 (Filing IDs [A4H1W2](#) through [A4H1W8](#)) and Consultation Update 4 (Filing ID [A72224](#)). These reports include results of consultation conducted to date, identification of issues and concerns as well as Trans Mountain's response and are included below. Where appropriate, Trans Mountain's response has been updated to reflect information developed since the original response was provided during the NEB proceeding for the Project.

Consultation and engagement activities completed between July 1, 2015 and February 24, 2017 have not been filed on the public record with the NEB. Any new issues and concerns identified during this period, as well as Trans Mountain's response, are described below.

2.0 Consultation and Engagement Overview: Draft Plan

The draft Marine Sediment Management Plan, which has been revised and renamed to this Plan, was released for review and feedback on November 22, 2016. The comment period closed on February 24, 2017. Email or mail notification regarding the Plan was sent to 141 public stakeholders, 17 regulatory authorities, 17 Aboriginal groups and all affected landowners. The notification included a summary description of the Plan, a request for review, the timing of the comment period and contact information. Aboriginal groups were offered the opportunity for an in-person meeting to review the Plan. See Appendix B for a complete list of notified stakeholders.

In addition to direct notification, the online posting of each Plan was promoted through Trans Mountain's weekly e-newsletter, Trans Mountain Today, which provides Project updates, regulatory information, stories and interviews to more than 6,000 subscribers. Each week Trans Mountain Today included a focus on a specific plan, or group of plans, as well as a reminder of all plans available for review.

- 2016
 - September 22—Wildlife Mitigation and Habitat Restoration Plans
 - September 29—Pipeline Environmental Protection Plans
 - October 6—Air Quality Management Plans
 - October 13—Watercourse and Water Ecosystems Plans
 - October 20—Vegetation Management Plans

- October 27—Air Quality Plans
- November 3—Socio-Economic Effects Monitoring Plan
- November 10—Access Management Plan
- December 22—General promotion all plans
- December 29—General promotion all plans
- 2017
 - January 5—General promotion all plans
 - January 12—General promotion all plans

Trans Mountain is committed to ongoing engagement throughout the life of the Project. The start and end date for the review and comment period for each environmental management plan is defined. These timelines are required to allow time for preparation of the final Plan in order to meet regulatory requirements and NEB submission dates.

3.0 Consultation and Engagement: Activities and Feedback

Consultation and engagement activities completed with identified stakeholder groups are described below, including: public stakeholders (Section 3.1); and Aboriginal groups (Section 3.2).

Feedback on this Plan, Trans Mountain’s response, and where each issue or concern is addressed in this Plan, has been outlined in each section according to stakeholder group.

3.1 Public Consultation

3.1.1 Public Consultation Summary—May 2012 to June 2015

Feedback regarding marine water and sediment quality received during public consultation and engagement activities between May 2012 and June 2015 is summarized in Table A-1.

Table A-1 Summary of Public Consultation—May 2012 to June 2015 ¹

Issue or Concern	Summary Trans Mountain Response	Where Addressed
Dredging of Burrard Inlet (i.e., is it necessary and whose decision would it be)	The exact configuration of the new docks has yet to be determined and depending on their location some near shore dredging might be necessary to accommodate construction of the new docks. Piles will be driven to support the new dock structures. Once the docks are constructed, berthing and mooring structures will be constructed. In addition, top-side equipment will be installed, such as piping systems, loading arms, vapour control systems and fire protection systems. The number of piles and other structures will depend on the results of ongoing planning and engineering.	Volume 8A, Section 2.0 – Description of Marine Transportation Activities
Impacts of dredging on tides and on West Vancouver’s shoreline near Ambleside	There is no proposed dredging of First or Second Narrows. Limited dredging will only be required for the expansion of Westridge Marine Terminal in Burnaby. Maintenance and dredging concerns to First Narrows fall within the stringent regulations and requirements of PMV (PMV) who would ultimately undertake a maintenance dredging program to ensure that oil tankers navigate local waters safely.	Volume 8A, Section 4.0 - ESA

Issue or Concern	Summary Trans Mountain Response	Where Addressed
Dredging requirements for the Project	Dredging of the Second Narrows to accommodate larger ships is not required for the Project. Dredging will be required in the area of Westridge (marine terminal) dock as part of the dock expansion and improvements. PMV manages the dredging program for Burrard Inlet and the Fraser River. More information can be found on their website at http://www.portmetrovancover.com/docs/default-source/Projects-	Volume 8A, Section 2.0 - Description of Marine Transportation Activities

NOTE:

¹ Table B-1, which was included in NEB Project proceedings, does not reflect current Project plan of no dredging of marine sediment.

3.1.2 New Interests, Issues, Concerns and Response—July 2015 to February 2017

No new issues or concerns with respect to marine water or sediment quality were identified by public stakeholders through engagement and communication opportunities between July 2015 and February 2017.

3.2 Regulatory Consultation

3.2.1 Regulatory Consultation Summary—May 2012 to June 2015

No feedback specific to this Plan was received between May 2012 and June 2015.

3.2.2 Feedback Regarding the Draft Plan—July 2015 to April 2017

Table A-2 includes new interests, issues and concerns, as well as Trans Mountain’s response with respect to marine water quality during rip rap removal identified through public consultation and engagement activities between July 2015 and April 2017.

Table A-2 Summary of Public Consultation—July 2015 to April 2017

Stakeholder Name	Method of Contact	Date of Consultation Activity	Issue or Concern	Trans Mountain Response	Where Addressed in the Plan
BC MOECCS	Email	April 13, 2017	<p>The in-water excavation component of the Westridge Marine Terminal Environmental Protection Plan outlined in Section 8 includes mitigation for reducing the remobilization of fine sediment during the removal of rip-rap from the intertidal and subtidal foreshore. Section 8.28 includes a commitment to monitor water quality during in-water excavation; however, no information is provided about which parameters will be measured, the frequency of monitoring, where monitoring will occur, which guidelines will be used to determine efficacy of mitigation and to trigger management actions, and an explanation of management actions that will be used to restore water quality to levels below guidelines. I recommend including a diagram showing monitoring locations (for example, Figure 1 in the Marine Sediment Management Plan). These deficiencies in the plan should be corrected in advance of in-water excavation activities</p>	<p>The Marine Water Quality Management Plan During Rip Rap Removal provides details on water quality monitoring, including parameters to be measured, frequency and location of monitoring, guidelines for screening, mitigation measures, and a figure showing sampling locations. The Westridge Marine Terminal Environmental Protection Plan was updated to include reference to the Marine Water Quality Management Plan During Rip Rap Removal.</p>	<p>Water quality guidelines are presented in Section 1.4, mitigation measures in Section 5.0, monitoring details in Section 6.0, and Figure 1 shows monitoring locations.</p>

3.3 Aboriginal Engagement

Since April 2012, Trans Mountain has engaged with Aboriginal groups who might have an interest in the Project or have Aboriginal interests potentially affected by the Project, based on the proximity of their community and their assertion of traditional and cultural use of the land along the pipeline corridor to maintain a traditional lifestyle. The objectives of Aboriginal engagement are to:

- Have an open, transparent and inclusive process that seeks to exchange information in a respectful manner
- Address concerns shared by those who might have an interest in the Project or have Aboriginal interests potentially affected by the Project
- Incorporate feedback into Project planning and execution
- Provide opportunities to maximize Project benefits to Aboriginal communities and Aboriginal groups

A comprehensive Aboriginal engagement process is led by experienced engagement advisors in Alberta and BC, specialized in the areas of Aboriginal relations, law, economic development, education, training, employment and procurement. Trans Mountain’s engagement process for the Project is flexible, allowing each community and group to engage in meaningful dialogue in the manner they choose and in a way to meet their objectives and values.

Each community has the opportunity to engage with Trans Mountain, depending on Project interests and potential effects. The following opportunities to engage have been provided:

- Project announcement
- Initial contact with Aboriginal community or Aboriginal group
- Meetings with Chief and Council and meetings with staff
- Host community information session(s)
- Conduct TLU studies and socio-economic interviews
- Identify interests and concerns
- Identify mitigation options

Issues and concerns specific to marine water and sediment quality raised during Aboriginal engagement between early 2012 and February 2017 are summarized in Table A-3.

Table A-3 Summary of Aboriginal Concerns Regarding Marine Water and Sediment Quality

Issue or Concern		Summary Trans Mountain Response	Where Addressed
Summary	Aboriginal Group		
More information is requested on actions taken in event that water quality samples or turbidity measurements exceed guidelines or thresholds.	Halalt	If water quality guideline exceedances are detected outside the silt curtains, the environmental monitor will inform the excavation contractor. Depending on the duration, extent, and magnitude of the exceedance, a temporary halt or adjustment of rip rap removal will be considered.	Section 2.0 and 3.0 of the Water Quality Management Plan During Rip Rap Removal

Trans Mountain continues to liaise with Indigenous and Northern Affairs Canada, the Government of Canada's Major Projects Management Office, the BC Ministry of Aboriginal Relations and Reconciliation, and the Alberta Ministry of Aboriginal Affairs to provide updates regarding Trans Mountain's engagement activities with Aboriginal groups.

Identifying Aboriginal Groups for Consultation

Trans Mountain used the First Nations Consultative Area Database Public Map Service to identify the Aboriginal groups with traditional territories that overlap with the Westridge Marine Terminal. Listed below are the Aboriginal groups identified for consultation. Throughout regular engagement with TMEP, any Aboriginal groups were added to the list if they identified marine water or sediment quality as a concern.

- Aitchelitz First Nation (Stó:lō)
- Cowichan Tribes
- Halalt First Nation (CNA)
- Kwikwetlem First Nation
- Lake Cowichan First Nation
- Leq'a:mel First Nation (Stó:lō)
- Lyackson First Nation
- Musqueam Indian Band
- Penelakut First Nation
- Popkum First Nation (Stó:lō)
- Skawahlook First Nation (Stó:lō)
- Skowkale First Nation (Stó:lō)
- Squamish Nation
- Stu'zuminus First Nation (Chemainus)
- Tsleil-Waututh Nation
- Tzeachten First Nation (Stó:lō)
- Yakweawkwoose First Nation (Stó:lō)

Consultation Activities

A letter was sent to the Aboriginal groups listed above with a copy of the draft Plan in December 2016. Where appropriate and upon request, a follow up meeting was arranged to discuss this Plan in more detail and address any concerns..

Trans Mountain has summarized the feedback received through Trans Mountain's engagement on this Plan in Tables A-1, A-2 and A-3 and the summary includes how Trans Mountain responded to and addressed the concern or issue. It should be noted that although the engagement process also provided for opportunity for general discussion about Project construction and associated Aboriginal issues and opportunities; only feedback/issues directly related to marine water and sediment quality are provided in this Plan. Other issues and topics raised have been captured in the corresponding mitigation plan as appropriate.

This final Plan will be shared with the Aboriginal groups at the same time as the Plan is filed with the NEB in 2017.

APPENDIX B

RECORD OF STAKEHOLDER NOTIFICATIONS OF PLAN

Table B-1 Record of Notification

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Landowners	N/A	September 11, 2016	Letter
Aboriginal Groups	N/A	December 2016	Letter
Vancouver Fraser Port Authority	Tim Blair	December 22, 2016	Email
Jasper National Park of Canada	Mayabe Dia	December 22, 2016	Email
Alberta Environment and Parks	Corinee Kristensen	December 22, 2016	Email
Ministry of Transportation and Infrastructure	Lisa Gow	December 22, 2016	Email
BC Parks	Ken Morrison	December 22, 2016	Email
BC Oil and Gas Commission	Brian Murphy	December 22, 2016	Email
Ministry of Natural Gas Development	Linda Beltrano	December 22, 2016	Email
Forests, Lands and Natural Resource Operations	Andrea Mah	December 22, 2016	Email
Forests, Lands and Natural Resource Operations	Susan Fitton	December 22, 2016	Email
FVAQC	Roger Quan	October 21,, 2016	Email
ECCC	Phil Wong	October 21, 2016	Email
ECCC	Rachel Mayberry	October 28, 2016	Email
ECCC	Coral Deshield	December 21,, 2016	Email
ECCC	Phil Wong	December 21, 2016	Email
Vancouver Fraser Port Authority	Patrick Coates	January 31, 2017	Email
Department of Fisheries and Oceans	Sandra Hollick-Kenyon	December 3, 2016	Email
Department of Fisheries and Oceans	Alston Bonamis	December 3, 2016	Email
City of Edmonton	N/A	November 29, 2016	Letter
City of Spruce Grove	N/A	November 29, 2016	Letter
Municipality of Jasper	N/A	November 29, 2016	Letter
Parkland County	N/A	November 29, 2016	Letter
Strathcona County	N/A	November 29, 2016	Letter
Town of Edson	N/A	November 29, 2016	Letter
Town of Hinton	N/A	November 29, 2016	Letter
Town of Stony Plain	N/A	November 29, 2016	Letter
Village of Wabamun	N/A	November 29, 2016	Letter
Yellowhead County	N/A	November 29, 2016	Letter
City of Kamloops	N/A	November 29, 2016	Letter
City of Kamloops RCMP Detachment	N/A	November 29, 2016	Letter
City of Merritt	N/A	November 29, 2016	Letter
City of Merritt RCMP Detachment	N/A	November 29, 2016	Letter
Clearwater Chamber of Commerce	N/A	November 29, 2016	Letter
District of Clearwater	N/A	November 29, 2016	Letter

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
District of Clearwater RCMP Detachment	N/A	November 29, 2016	Letter
Interior Health	N/A	November 29, 2016	Letter
Merritt Chamber of Commerce	N/A	November 29, 2016	Letter
Northern Health	N/A	November 29, 2016	Letter
Regional District of Fraser Fort George	N/A	November 29, 2016	Letter
Thompson Nicola Regional District	N/A	November 29, 2016	Letter
Town of Blue River	N/A	November 29, 2016	Letter
Venture Kamloops	N/A	November 29, 2016	Letter
Village of Valemout	N/A	November 29, 2016	Letter
Village of Valemout RCMP Detachment	N/A	November 29, 2016	Letter
Nicola Stock Breeder's Association - on behalf of the BC Cattlemen's Association	N/A	November 29, 2016	Letter
Grassland's Conservation Council	N/A	November 29, 2016	Letter
Thompson Rivers University	N/A	November 29, 2016	Letter
Southern Interior Weed Management Committee	N/A	November 29, 2016	Letter
Fraser Basin Council	N/A	November 29, 2016	Letter
Northwest Invasive Plant Council (NWIPC)		November 29, 2016	
Grassland's Conservation Council	N/A	November 29, 2016	Letter
Abbotsford Chamber of Commerce	N/A	November 29, 2016	Letter
Abbotsford Police Department	N/A	November 29, 2016	Letter
ASCA	N/A	November 29, 2016	Letter
BC Invasive Species	N/A	November 29, 2016	Letter
BC Ministry of Children and Family Development	N/A	November 29, 2016	Letter
BC Ministry of Social Development	N/A	November 29, 2016	Letter
BC Nature	N/A	November 29, 2016	Letter
BC Wildlife Federation	N/A	November 29, 2016	Letter
Burnaby Board of Trade	N/A	November 29, 2016	Letter
Burnaby RCMP Detachment	N/A	November 29, 2016	Letter
Chilliwack Chamber of Commerce	N/A	November 29, 2016	Letter
Chilliwack Economic Partners	N/A	November 29, 2016	Letter
City of Abbotsford	N/A	November 29, 2016	Letter
City of Burnaby	N/A	November 29, 2016	Letter
City of Chilliwack	N/A	November 29, 2016	Letter
City of Coquitlam	N/A	November 29, 2016	Letter
City of New Westminster	N/A	November 29, 2016	Letter
City of Port Coquitlam	N/A	November 29, 2016	Letter
City of Port Moody	N/A	November 29, 2016	Letter
City of Surrey	N/A	November 29, 2016	Letter
Coquitlam RCMP Detachment	N/A	November 29, 2016	Letter
Corporation of Delta	N/A	November 29, 2016	Letter
District of Hope	N/A	November 29, 2016	Letter

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Eagle Creek	N/A	November 29, 2016	Letter
Fraser Valley Invasive Plant Council	N/A	November 29, 2016	Letter
Fraser Valley Regional District	N/A	November 29, 2016	Letter
Glen Valley Watershed Society	N/A	November 29, 2016	Letter
Hope Chamber of Commerce	N/A	November 29, 2016	Letter
Hope Community Policing Office	N/A	November 29, 2016	Letter
Langley Chamber of Commerce	N/A	November 29, 2016	Letter
LEPS	N/A	November 29, 2016	Letter
LFVAQCC	N/A	November 29, 2016	Letter
Metro Vancouver	N/A	November 29, 2016	Letter
Newton RCMP Detachment	N/A	November 29, 2016	Letter
RCMP Division 'E'	N/A	November 29, 2016	Letter
Sapperton Fish and Game	N/A	November 29, 2016	Letter
Stoney Creek	N/A	November 29, 2016	Letter
Surrey Board of Trade	N/A	November 29, 2016	Letter
Surry Environmental Partners	N/A	November 29, 2016	Letter
Surrey RCMP Detachment	N/A	November 29, 2016	Letter
Township of Langley	N/A	November 29, 2016	Letter
Township of Langley RCMP Detachment	N/A	November 29, 2016	Letter
TriCities Chamber of Commerce	N/A	November 29, 2016	Letter
Upper Fraser Valley Regional Detachment	N/A	November 29, 2016	Letter
Village of Anmore	N/A	November 29, 2016	Letter
Village of Belcarra	N/A	November 29, 2016	Letter
Yorkson	N/A	November 29, 2016	Letter
ACGI Shipping	N/A	November 29, 2016	Letter
Barnett Marine Park	N/A	November 29, 2016	Letter
BC Ambulance	N/A	November 29, 2016	Letter
BC Chamber of Shipping	N/A	November 29, 2016	Letter
BC Coast Pilots (BCCP)	N/A	November 29, 2016	Letter
BROKE (Burnaby Residents Opposed to Kinder Morgan Expansion)	N/A	November 29, 2016	Letter
Canadian Pacific (CP) Rail	N/A	November 29, 2016	Letter
Canexus- Ero- Newalta-Univar Community Advisory Panal (CAP)	N/A	November 29, 2016	Letter
Canexus Chemicals	N/A	November 29, 2016	Letter
Chevron	N/A	November 29, 2016	Letter
CN Rail	N/A	November 29, 2016	Letter
Council of Marine Carriers	N/A	November 29, 2016	Letter
District of North Vancouver	N/A	November 29, 2016	Letter
Empire Shipping	N/A	November 29, 2016	Letter
Erco Worldwide	N/A	November 29, 2016	Letter
First Nation Emergency Services Society (FNESS)	N/A	November 29, 2016	Letter
First Nation Health Authority	N/A	November 29, 2016	Letter
Fraser Health Authority	N/A	November 29, 2016	Letter

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Inchcape Shipping	N/A	November 29, 2016	Letter
Island Tug and Barge	N/A	November 29, 2016	Letter
Kask Brothers	N/A	November 29, 2016	Letter
Ledcor Resources and Transportation Limited Partnership	N/A	November 29, 2016	Letter
Mason Agency (Shipping Service)	N/A	November 29, 2016	Letter
MLA- Burnaby Lougheed	N/A	November 29, 2016	Letter
MLA- Burnaby North	N/A	November 29, 2016	Letter
MLA- Coquitlam – Burke Mountain	N/A	November 29, 2016	Letter
MLA- North Vancouver Lonsdale	N/A	November 29, 2016	Letter
MLA- North Vancouver Seymour	N/A	November 29, 2016	Letter
MLA- Port Moody- Coquitlam	N/A	November 29, 2016	Letter
MP- Delta	N/A	November 29, 2016	Letter
MP- North Burnaby Seymour	N/A	November 29, 2016	Letter
MP- North Vancouver	N/A	November 29, 2016	Letter
MP- Vancouver Centre	N/A	November 29, 2016	Letter
MP- Vancouver East	N/A	November 29, 2016	Letter
MP- Vancouver Quadra	N/A	November 29, 2016	Letter
MP- West Vancouver – Sunshine Coast – Sea to Sky Country	N/A	November 29, 2016	Letter
North Shore NOPE	N/A	November 29, 2016	Letter
North Vancouver Chamber of Commerce	N/A	November 29, 2016	Letter
Pacific Coast Terminal	N/A	November 29, 2016	Letter
Pacific Pilotage Authority	N/A	November 29, 2016	Letter
Pacific Wildlife Foundation	N/A	November 29, 2016	Letter
Peter Kiewit Infrastructure Co.	N/A	November 29, 2016	Letter
Seaspan	N/A	November 29, 2016	Letter
Shell Terminal	N/A	November 29, 2016	Letter
Simon Fraser University	N/A	November 29, 2016	Letter
SMIT Marine	N/A	November 29, 2016	Letter
Suncor Terminal	N/A	November 29, 2016	Letter
UBC Stellar Sea Lion (Marine Mammal) Research Centre	N/A	November 29, 2016	Letter
Vancouver Aquarium	N/A	November 29, 2016	Letter
Vancouver Board of Trade	N/A	November 29, 2016	Letter
Vancouver Coastal Health Authority	N/A	November 29, 2016	Letter
Vancouver Pile and Dredge	N/A	November 29, 2016	Letter
West Vancouver Chamber of Commerce	N/A	November 29, 2016	Letter
Westward Shipping	N/A	November 29, 2016	Letter
Wild Bird Trust	N/A	November 29, 2016	Letter
Metro Vancouver Regional District	Ali Ergudenler	November 29, 2016	Email
Metro Vancouver Regional District	Roger Quan	November 29, 2016	Email