



Trans Mountain Pipeline ULC



Trans Mountain Expansion Project

An Application Pursuant to Section 52 of the National Energy Board Act

December 2013

Volume

6a

Environmental Compliance

NATIONAL ENERGY BOARD

IN THE MATTER OF

**the *National Energy Board Act*,
R.S.C. 1985, c. N-7, as amended, (“*NEB Act*”)
and the Regulations made thereunder;**

AND IN THE MATTER OF

**the *Canadian Environmental Assessment Act, 2012*,
S.C. 2012, c. 37, as amended,
and the Regulations made thereunder;**

AND IN THE MATTER OF

**an application by Trans Mountain Pipeline ULC
as General Partner of Trans Mountain Pipeline L.P.
(collectively “Trans Mountain”)
for a Certificate of Public Convenience and Necessity and
other related approvals pursuant to Part III of the *NEB Act***

**APPLICATION BY TRANS MOUNTAIN FOR APPROVAL OF
THE TRANS MOUNTAIN EXPANSION PROJECT**

December 2013

**To: The Secretary
The National Energy Board
444 — 7th Avenue SW
Calgary, AB T2P 0X8**

Trans Mountain Expansion Project

Application Pursuant to Section 52 of the *National Energy Board Act*

Guide to the Application

Application	
Transmittal - Letter to the National Energy Board	
Volume 1	Summary
Volume 2	Project Overview, Economics and General Information
Volume 3A	Public Consultation
Volume 3B	Aboriginal Engagement
Volume 3C	Landowner Relations
Volume 4A	Project Design and Execution – Engineering
Volume 4B	Project Design and Execution – Construction
Volume 4C	Project Design and Execution – Operations and Maintenance
Volume 5A	Environmental and Socio-Economic Assessment – Biophysical
Volume 5B	Environmental and Socio-Economic Assessment – Socio-Economic
Volume 5C	Environmental and Socio-Economic Assessment – Biophysical Technical Reports
Volume 5D	Environmental and Socio-Economic Assessment – Socio-Economic Technical Reports
Volume 6A	Environmental Compliance
Volume 6B	Pipeline Environmental Protection Plan
Volume 6C	Facilities Environmental Protection Plan
Volume 6D	Westridge Marine Terminal Environmental Protection Plan
Volume 6E	Environmental Alignment Sheets
Volume 7	Risk Assessment and Management of Pipeline and Facility Spills
Volume 8A	Marine Transportation
Volume 8B	Marine Environmental and Socio-Economic Technical Reports
Volume 8C	TERMPOL Reports

This volume contains:

Volume 6A			
Section 1.0	Introduction	Section 7.0	Environmental Inspection During Construction
Section 2.0	Environmental Protection	Section 8.0	Issue Monitoring During Construction
Section 3.0	Environmental Compliance Program	Section 9.0	Post-Construction Environmental Monitoring
Section 4.0	Approach to Environmental Management	Section 10.0	References
Section 5.0	Pre-Construction Activities		
Section 6.0	Environmental Education		

NEB FILING MANUAL CHECKLIST

CHAPTER 3 – COMMON INFORMATION REQUIREMENTS

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
3.1 Action Sought by Applicant			
1.	Requirements of s.15 of the Rules.	Volume 1 Section 1.1	---
3.2 Application or Project Purpose			
1.	Purpose of the proposed project.	Volume 2 Section 1.1	---
3.4 Consultation			
		Volumes 3A, 3B, 3C; Volumes 5A, 5B Section 3; Volume 8A Section 3	--
3.4.1 Principles and Goals of Consultation			
1.	The corporate policy or vision.	Volume 3A Section 1.2.1 Volume 3B Section 1.2.1	--
2.	The principles and goals of consultation for the project.	Volume 3A Section 1.2.2 Volume 3B Section 1.2.2 Volume 5A Section 3.2.1 Volume 5B Section 3.2.1	--
3.	A copy of the Aboriginal protocol and copies of policies and principles for collecting traditional use information, if available.	Volume 3B Section 1.3.5	--
3.4.2 Design of Consultation Program			
1.	The design of the consultation program and the factors that influenced the design.	Volume 3A Section 1.3 Volume 3B Section 1.3 Volume 5A Section 3.1.1, 3.2.2 Volume 5B Section 3.1.1, 3.2.2	--
3.4.3 Implementing a Consultation Program			
1.	The outcomes of the consultation program for the project.	Volume 3A Section 1.7 Volume 3B Section 1.5 Table 1.5.1 Volume 5A Section 3.1.5, 3.2.4 Volume 5B Section 3.1.5, 3.2.4	--
3.4.4 Justification for Not Undertaking a Consultation Program			
2.	The application provides justification for why the applicant has determined that a consultation program is not required for the project.	N/A	N/A
3.5 Notification of Commercial Third Parties			
1.	Confirm that third parties were notified.	Volume 2 Section 3.2.2	--
2.	Details regarding the concerns of third parties.	Volume 2 Section 3.2.2	--
3.	List the self-identified interested third parties and confirm they have been notified.	N/A	N/A
4.	If notification of third parties is considered unnecessary, an explanation to this effect.	N/A	N/A

**CHAPTER 4 – SECTIONS 4.1 AND 4.2: COMMON REQUIREMENTS FOR
 PHYSICAL PROJECTS**

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
4.1 Description of the Project			
1.	The project components, activities and related undertakings.	Volume 2 Section 2.0; Volume 4A	--
2.	The project location and criteria used to determine the route or site.	Volume 2 Section 4.0; Volume 4A	--
3.	How and when the project will be carried out.	Volume 2 Section 2.3; Volume 4B Section 2.0	--
4.	Description of any facilities, to be constructed by others, required to accommodate the proposed facilities.	N/A	N/A
5.	An estimate of the total capital costs and incremental operating costs, and changes to abandonment cost estimates.	Volume 2 Section 2.9	--
6.	The expected in-service date.	Volume 2 Section 1.1; Volume 4B Section 2.1	--
4.2 Economic Feasibility, Alternatives and Justification			
4.2.1 Economic Feasibility			
1.	Describe the economic feasibility of the project.	Volume 2 Section 3.5	--
4.2.2 Alternatives			
1.	Describe the need for the project, other economically-feasible alternatives to the project examined, along with the rationale for selecting the applied for project over these other possible options.	Volume 2 Section 3.0; Volume 8A Section 2.2	--
2.	Describe and justify the selection of the proposed route and site including a comparison of the options evaluated using appropriate selection criteria.	Volume 2 Section 4.0; Volume 8A Section 2.2	--
3.	Describe the rationale for the chosen design and construction methods. Where appropriate, describe any alternative designs and methods evaluated and explain why these other options were eliminated.	Volume 2 Section 4.0; Volume 8A Section 2.2	--
4.2.3 Justification			
1.	Provide a justification for the proposed project	Volume 2 Section 3.4	--

GUIDE A – A.1 ENGINEERING

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
A.1.1 Engineering Design Details			
1.	Fluid type and chemical composition.	Volume 4A Section 3.1.1	--
2.	Line pipe specifications.	Volume 4A Section 3.2.8	--
3.	Pigging facilities specifications.	Volume 4A Section 3.3.1, 3.3.2	--
4.	Compressor or pump facilities specifications.	Volume 4A Section 3.4	--
5.	Pressure regulating or metering facilities specifications.	Volume 4A Section 3.5	--
6.	Liquid tank specifications, or other commodity storage facilities.	Volume 4A Section 3.4	--
7.	New control system facilities specifications.	Volume 4A Section 3.3	--
8.	Gas processing, sulphur or LNG plant facilities specifications.	N/A	N/A
9.	Technical description of other facilities not mentioned above.	N/A	N/A
10.	Building dimensions and uses.	Volume 4A Section 3.3, 3.4, 3.5	--
11.	If project is a new system that is a critical source of energy supply, a description of the impact to the new system capabilities following loss of critical component.	N/A	N/A
A.1.2 Engineering Design Principles			
1.	Confirmation project activities will follow the requirements of the latest version of CSA Z662.	Volume 4A Section 2.2	--
2.	Provide a statement indicating which Annex is being used and for what purpose	Volume 4A Section 2.3	--
3.	Statement confirming compliance with OPR or PPR.	Volume 4A Section 2.1	--
4.	Listing of all primary codes and standards, including version and date of issue.	Volume 4A Section 2, Table 5.1.1	--
5.	Confirmation that the project will comply with company manuals and confirm manuals comply with OPR/PPR and codes and standards.	Volume 4A Section 2.6, Table 5.1.2	--
6.	Any portion of the project a non-hydrocarbon commodity pipeline system? Provide a QA program to ensure the materials are appropriate for their intended service.	N/A – all hydrocarbons	N/A
7.	If facility subject to conditions not addressed in CSA Z662: <ul style="list-style-type: none"> • Written statement by qualified professional engineer • Description of the designs and measures required to safeguard the pipeline 	Volume 4A Section 2.9	--
8.	If directional drilling involved: <ul style="list-style-type: none"> • Preliminary feasibility report • Description of the contingency plan 	Volume 4A Section 2.12	--
9.	If the proposed project involves the reuse of materials, provide an engineering assessment in accordance with CSA Z662 that indicates its suitability for the intended service.	Volume 4A, Section 2.7	--
10.	If new materials are involved, provide material supply chain information, in tabular format.	Volume 4A Section 2.7	
11.	If reuse of material is involved, provide an engineering assessment in accordance with CSA Z662 that indicates its suitability for the intended service.	Volume 4A, Section 2.7	--
A.1.3 Onshore Pipeline Regulations			
1.	Designs, specifications programs, manuals, procedures, measures or plans for which no standard is set out in the OPR or PPR.	--	Existing standards will be followed
2.	A quality assurance program if project non-routine or incorporates unique challenges due to geographical location.	--	No unique challenges
3.	If welding performed on a liquid-filled pipeline that has a carbon equivalent of 0.50% or greater and is a permanent installation: <ul style="list-style-type: none"> • Welding specifications and procedures • Results of procedure qualification tests 	--	Welding on liquid filled pipe will not be conducted

GUIDE A – A.2 ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT

The following table identifies where information requested in the National Energy Board (NEB) Filing Manual Guide A – A.2 Environmental and Socio-economic Assessment checklist may be found in the various volumes of the Application for the Trans Mountain Expansion Project.

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
A.2.5 Description of the Environmental and Socio-Economic Setting				
1.	Identify and describe the current biophysical and socio-economic setting of each element (<i>i.e.</i> , baseline information) in the area where the project is to be carried out.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Section 4.2 Volume 8B: Technical Reports	---
2.	Describe which biophysical or socio-economic elements in the study area are of ecological, economic, or human importance and require more detailed analysis taking into account the results of consultation (see Table A-1 for examples). Where circumstances require more detailed information in an ESA see: i. Table A-2 – Filing Requirements for Biophysical Elements; or ii. Table A-3 – Filing Requirements for Socio-economic Elements.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Section 4.2 Volume 8B: Technical Reports	---
3.	Provide supporting evidence (<i>e.g.</i> , references to scientific literature, field studies, local and traditional knowledge, previous environmental assessment and monitoring reports) for: <ul style="list-style-type: none"> • information and data collected; • analysis completed; • conclusions reached; and • the extent of professional judgment or experience relied upon in meeting these information requirements, and the rationale for that extent of reliance. 	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Section 4.2 Volume 8B: Technical Reports	---
4.	Describe and substantiate the methods used for any surveys, such as those pertaining to wildlife, fisheries, plants, species at risk or species of special status, soils, heritage resources or traditional land use, and for establishing the baseline setting for the atmospheric and acoustic environment.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Section 4.2 Volume 8B: Technical Reports	---
5.	Applicants must consult with other expert federal, provincial or territorial departments and other relevant authorities on requirements for baseline information and methods.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 3.0, 5.0 and 6.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 3.0, 5.0 and 6.0 Volume 5C: ESA - Biophysical Technical Reports Volume 5D: ESA - Socio-Economic Technical Reports	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 3.0 and 4.2 Volume 8B: Technical Reports	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
A.2.6 Effects Assessment				
Identification and Analysis of Effects				
1.	Describe the methods used to predict the effects of the project on the biophysical and socio-economic elements, and the effects of the environment on the project (<i>i.e.</i> , changes to the Project caused by the environment).	<p>Volume 5A: ESA - Biophysical</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 5B: ESA - Socio-Economic</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 7: Risk Assessment and Management of Pipeline and Facility Spills</p> <ul style="list-style-type: none"> Sections 6.0, 7.0 and 8.0 Technical Reports 	<p>Volume 8A: Marine Transportation</p> <ul style="list-style-type: none"> Sections 4.3, 5.5 and 5.6 	---
2.	Predict the effects associated with the proposed project, including those that could be caused by construction, operations, decommissioning or abandonment, as well as accidents and malfunctions. Also include effects the environment could have on the project. For those biophysical and socio-economic elements or their valued components that require further analysis (see Table A-1), provide the detailed information outlined in Tables A-2 and A-3.	<p>Volume 5A: ESA - Biophysical</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 5B: ESA - Socio-Economic</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 5C: ESA - Biophysical Technical Reports</p> <p>Volume 5D: ESA - Socio-Economic Technical Reports</p> <p>Volume 7: Risk Assessment and Management of Pipeline and Facility Spills</p> <ul style="list-style-type: none"> Sections 6.0, 7.0 and 8.0 Technical Reports 	<p>Volume 8A: Marine Transportation</p> <ul style="list-style-type: none"> Sections 4.3, 5.6 and 5.7 <p>Volume 8B: Technical Reports</p>	---
Mitigation Measures for Effects				
1.	Describe the standard and project specific mitigation measures and their adequacy for addressing the project effects, or clearly reference specific sections of company manuals that provide mitigation measures. Ensure that referenced manuals are current and filed with the NEB.	<p>Volume 5A: ESA - Biophysical</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 5B: ESA - Socio-Economic</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 5C: ESA - Biophysical Technical Reports</p> <p>Volume 5D: ESA - Socio-Economic Technical Reports</p> <p>Volume 6B: Pipeline Environmental Protection Plan (EPP)</p> <p>Volume 6C: Facilities EPP</p> <p>Volume 6D: Westridge Marine Terminal EPP</p> <p>Volume 6E: Environmental Alignment Sheets</p> <p>Volume 7: Risk Assessment and Management of Pipeline and Facility Spills</p> <ul style="list-style-type: none"> Sections 2.0, 3.0, 4.0, 6.0, 7.0, and 8.0 Technical Reports 	<p>Volume 8A: Marine Transportation</p> <ul style="list-style-type: none"> Sections 4.3, 5.1, 5.3, 5.6 and 5.7 <p>Volume 8B: Technical Reports</p>	---
2.	Ensure that commitments about mitigative measures will be communicated to field staff for implementation through an Environmental Protection Plan.	<p>Volume 5A: ESA - Biophysical</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 5B: ESA - Socio-Economic</p> <ul style="list-style-type: none"> Section 7.0 <p>Volume 6A: Environmental Compliance</p> <p>Volume 6B: Pipeline EPP</p> <p>Volume 6C: Facilities EPP</p> <p>Volume 6D: Westridge Marine Terminal EPP</p> <p>Volume 6E: Environmental Alignment Sheets</p> <p>Volume 7: Risk Assessment and Management of Pipeline and Facility Spills</p> <ul style="list-style-type: none"> Sections 2.0, 3.0, 4.0, 6.0, 7.0 and 8.0 	<p>Volume 8A: Marine Transportation</p> <ul style="list-style-type: none"> Sections 4.3, 5.1, 5.3, 5.6 and 5.7 	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
3.	Describe plans and measures to address potential effects of accidents and malfunctions during construction and operation of the project.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> Sections 2.0, 4.0, 6.0, 7.0 and 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Sections 4.3, 5.1, 5.3, 5.6 and 5.7 	---
Evaluation of Significance				
1.	After taking into account any appropriate mitigation measures, identify any remaining residual effects from the project.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.3 	---
2.	Describe the methods and criteria used to determine the significance of remaining adverse effects, including defining the point at which any particular effect on a valued component is considered "significant".	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.3 	---
3.	Evaluate significance of residual adverse environmental and socio-economic effects against the defined criteria.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.3 	---
4.	Evaluate the likelihood of significant, residual adverse environmental and socio-economic effects occurring and substantiate the conclusions made.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.3 	---
A.2.7 Cumulative Effects Assessment				
Scoping and Analysis of Cumulative Effects				
1.	Identify the valued components for which residual effects are predicted, and describe and justify the methods used to predict any residual results.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
2.	For each valued component where residual effects have been identified, describe and justify the spatial and temporal boundaries used to assess the potential cumulative effects.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
3.	Identify other physical works or activities that have been or will be carried out within the identified spatial and temporal boundaries for the cumulative effects assessment.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
4.	Identify whether the effects of those physical works or activities that have been or will be carried out would be likely to produce effects on the valued components within the identified spatial and temporal boundaries.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
5.	Where other physical works or activities may affect the valued components for which residual effects from the applicant's proposed project are predicted, continue the cumulative effects assessment, as follows: <ul style="list-style-type: none"> consider the various components, phases and activities associated with the applicant's project that could interact with other physical work or activities; provide a description of the extent of the cumulative effects on valued components; and where professional knowledge or experience is cited, explain the extent to which professional knowledge or experience was relied upon and justify how the resulting conclusions or decisions were reached. 	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
Mitigation Measures for Cumulative Effects				
1.	Describe the general and specific mitigation measures, beyond project-specific mitigation already considered, that are technically and economically feasible to address any cumulative effects.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
Applicant's Evaluation of Significance of Cumulative Effects				
1.	After taking into account any appropriate mitigation measures for cumulative effects, identify any remaining residual cumulative effects.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
2.	Describe the methods and criteria used to determine the significance of remaining adverse cumulative effects, including defining the point at which each identified cumulative effect on a valued component is considered "significant".	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
3.	Evaluate the significance of adverse residual cumulative effects against the defined criteria.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
4.	Evaluate the likelihood of significant, residual adverse cumulative environmental and socio-economic effects occurring and substantiate the conclusions made.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 8.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.4 	---
A.2.8 Inspection, Monitoring and Follow-up				
1.	Describe inspection plans to ensure compliance with biophysical and socio-economic commitments, consistent with Sections 48, 53 and 54 of the <i>NEB Onshore Pipeline Regulations (OPR)</i> .	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.3 	---
2.	Describe the surveillance and monitoring program for the protection of the pipeline, the public and the environment, as required by Section 39 of the <i>NEB OPR</i> .	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> Section 7.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> Section 7.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP Volume 6C: Facilities EPP Volume 6D: Westridge Marine Terminal EPP	Volume 8A: Marine Transportation <ul style="list-style-type: none"> Section 4.3 	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
3.	Consider any particular elements in the Application that are of greater concern and evaluate the need for a more in-depth monitoring program for those elements.	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 9.0 and 10.0 Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 9.0 and 10.0 Volume 6A: Environmental Compliance Volume 6B: Pipeline EPP (Socio-Economic Management Plan of Appendix C)	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Section 4.5 	---
4.	For <i>Canadian Environmental Assessment (CEA) Act, 2012</i> designated projects, identify which elements and monitoring procedures would constitute follow-up under the <i>CEA Act, 2012</i> .	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Section 10.0 Volume 5B: ESA - Socio-economic <ul style="list-style-type: none"> • Section 10.0 	N/A	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
Table A-1 Circumstances and Interactions Requiring Detailed Biophysical and Socio-Economic Information				
	Physical and meteorological environment	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0 and 7.0	N/A	---
	Soil and soil productivity	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports • Soil Assessment Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills • Section 5.3, 6.0 and 7.0	N/A	---
	Water quality and quantity (onshore and marine)	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports • Groundwater Technical Report • Fisheries (Alberta) Technical Report • Fisheries (British Columbia) Technical Report • Wetland Evaluation Technical Report • Marine Sediment and Water Quality – Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills • Section 7.0 • Quality Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports • Ecological Risk Assessment of Marine Transportation Spills Technical Report	---
	Air emissions (onshore and marine)	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports • Marine Air Quality and Greenhouse Gas – Marine Transportation Technical Report • Air Quality and Greenhouse Gas Emissions Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills • Section 7.0	Volume 8A: Marine Transportation • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports • Marine Air Quality and Greenhouse Gas Emissions	---
	Greenhouse gas emissions (onshore and marine)	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0 and 7.0 Volume 5C: ESA - Biophysical Technical Reports • Air Quality and Greenhouse Gas Emissions Technical Report	Volume 8A: Marine Transportation • Sections 4.2 and 4.3 Volume 8B: Technical Reports • Marine Air Quality and Greenhouse Gas Emissions	---
	Acoustic environment (onshore and marine)	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0, 7.0, and 8.0 Volume 5C: ESA - Biophysical Technical Reports • Acoustic Environment Technical Report	Volume 8A: Marine Transportation • Sections 4.2, 4.3 and 4.4 Volume 8B: Technical Reports • Marine Noise (Atmospheric)	---
	Fish and fish habitat (onshore and marine), including any fish habitat compensation required	Volume 5A: ESA - Biophysical • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports • Fisheries (Alberta) Technical Report • Fisheries (British Columbia) Technical Report • Marine Resources - Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills • Sections 6.0, 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report	Volume 8A: Marine Transportation • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports • Marine Resources – Marine Transportation Technical Report • Ecological Risk Assessment of Westridge Marine Terminal Spills	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
	Wetlands	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports <ul style="list-style-type: none"> • Wetland Evaluation Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report 	N/A	---
	Vegetation	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports <ul style="list-style-type: none"> • Vegetation Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report 	N/A	---
	Wildlife and wildlife habitat (onshore and marine)	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports <ul style="list-style-type: none"> • Wildlife and Wildlife Habitat Technical Report • Wildlife Modeling and Species Accounts Report • Marine Resources –Westridge Marine Terminal Technical Report • Marine Birds – Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports <ul style="list-style-type: none"> • Marine Resources – Marine Transportation Technical Report • Marine Birds – Marine Transportation Technical Report • Ecological Risk Assessment of Westridge Marine Terminal Spills 	---
	Species at Risk or Species of Special Status and related habitat (onshore and marine)	Volume 5A: ESA - Biophysical <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C: ESA - Biophysical Technical Reports <ul style="list-style-type: none"> • Fisheries (Alberta) Technical Report • Fisheries (British Columbia) Technical Report • Vegetation Technical Report • Wildlife and Wildlife Habitat Technical Report • Wildlife Modeling and Species Accounts Report • Marine Resources –Westridge Marine Terminal Technical Report • Marine Birds – Westridge Marine Terminal Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports <ul style="list-style-type: none"> • Marine Resources – Marine Transportation Technical Report • Marine Birds – Marine Transportation Technical Report • Marine Transportation Spills Ecological Risk Assessment Technical Report 	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
	Human occupancy and resource use (onshore and marine)	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Socio-Economic Technical Report • Managed Forest Areas Technical Report • Agricultural Assessment Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports <ul style="list-style-type: none"> • Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report 	---
	Heritage resources	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0 and 7.0 Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Section 6.3.3 	N/A	---
	Navigation and navigation safety	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0 and 7.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Socio-Economic Technical Report 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Section 5.2 	---
	Traditional land and resource use	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Traditional Land and Resource Use Report • Pipeline and Facilities Human Health Risk Assessment Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports <ul style="list-style-type: none"> • Traditional Marine Use Report for Marine Transportation • Marine Transportation Human Health Risk Assessment Technical Report 	---
	Social and cultural well-being	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Socio-Economic Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 	N/A	---
	Human health and aesthetics	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Socio-Economic Technical Report • Community Health Technical Report • Viewshed Modelling Analysis Technical Report • Pipeline and Facilities Human Health Risk Assessment Technical Report Volume 7 Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 • Qualitative Ecological Risk Assessment of Pipeline Spills Technical Report 	Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Qualitative Human Health Risk Assessment of Westridge Marine Terminal Technical Report Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports <ul style="list-style-type: none"> • Marine Transportation Human Health Risk Assessment Technical Report • Marine Transportation Spills Human Health Risk Assessment Technical Report 	---

Filing #	Filing Requirement	In Application? References	Applicable Marine Transportation Elements	Not in Application? Explanation
	Infrastructure and services	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Socio-Economic Technical Report • Community Health Technical Report Volume 7: Risk Assessment and Management of Pipeline and Facility Spills <ul style="list-style-type: none"> • Sections 6.0, 7.0 and 8.0 	Volume 8A: Marine Transportation <ul style="list-style-type: none"> • Sections 4.2, 4.3, 4.4, 5.6 and 5.7 Volume 8B: Technical Reports <ul style="list-style-type: none"> • Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report 	---
	Employment and economy	Volume 5B: ESA - Socio-Economic <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D: ESA - Socio-Economic Technical Reports <ul style="list-style-type: none"> • Socio-Economic Technical Report • Worker Expenditures Analysis Technical Report 	N/A	---

GUIDE A – A.3 ECONOMICS

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
A.3.1 Supply			
1.	A description of each commodity.	Volume 2 Section 3.1.1	--
2.	A discussion of all potential supply sources.	Volume 2 Section 3.3.2	--
3.	Forecast of productive capacity over the economic life of the facility.	Volume 2 Sections 3.3.1, 3.4.1	
4.	For pipelines with contracted capacity, a discussion of the contractual arrangements underpinning supply.	Volume 2 Section 3.3.2	--
A.3.2 Transportation Matters			
Pipeline Capacity			
1.	In the case of expansion provide: <ul style="list-style-type: none"> • Pipeline capacity before and after and size of increment • Justification that size of expansion is appropriate 	Volume 2 Sections 1.1, 2.1, 3.5	--
2.	In case of new pipeline, justification that size of expansion is appropriate given available supply.	N/A – expansion	N/A
Throughput			
1.	For pipelines with contracted capacity, information on contractual arrangements.	Volume 2 Section 3.2.1	--
2.	For non-contract carrier pipelines, forecast of annual throughput volumes by commodity type, receipt location and delivery destination over facility life.	N/A	N/A
3.	If project results in an increase in throughput: <ul style="list-style-type: none"> • theoretical and sustainable capabilities of the existing and proposed facilities versus the forecasted requirements • flow formulae and flow calculations used to determine the capabilities of the proposed facilities and the underlying assumptions and parameters 	Volume 2 Section 3.1	--
4.	If more than one type of commodity transported, a discussion pertaining to segregation of commodities including potential contamination issues or cost impacts.	N/A	N/A
A.3.3 Markets			
1.	Provide an analysis of the market in which each commodity is expected to be used or consumed.	Volume 2 Section 3.4.2	--
2.	Provide a discussion of the physical capability of upstream and downstream facilities to accept the incremental volumes that would be received and delivered.	Volume 2 Section 3.4.2	--
A.3.4 Financing			
1.	Evidence that the applicant has the ability to finance the proposed facilities.	Volume 2 Section 3.2.2	--
2.	Estimated toll impact for the first full year that facilities are expected to be in service.	Volume 2 Section 3.2.1	--
3.	Confirmation that shippers have been apprised of the project and toll impact, their concerns and plans to address them.	Volume 2 Section 3.2.1	--
4.	Additional toll details for applications with significant toll impacts.	Volume 2 Section 3.2.1	
A.3.5 Non-NEB Regulatory Approvals			
1.	Confirm that all non-NEB regulatory approvals required to allow the applicant to meet its construction schedule, planned in-service date and to allow the facilities to be used and useful are or will be in place.	Volume 2 Section 1.5	--
2.	If any of the approvals referred to in #1 may be delayed, describe the status of those approval(s) and provide an estimation of when the approval is anticipated.	Volume 2 Section 1.5	--

GUIDE A – A.4 LANDS INFORMATION

Filing #	Filing Requirement	In Application? References	Not in Application? Explanation
A.4.1 Land Areas			
1.	<ul style="list-style-type: none"> • Width of right-of-way and locations of any changes to width • Locations and dimensions of known temporary work space and drawings of typical dimensions • Locations and dimensions of any new lands for facilities 	Volume 2 Section 5.2	--
A.4.2 Land Rights			
1.	The type of lands rights proposed to be acquired for the project.	Volume 2 Section 5.3	--
2.	The relative proportions of land ownership along the route of the project.	Volume 2 Section 5.3.2	--
3.	Any existing land rights that will be required for the project.	Volume 2 Section 5.4	--
A.4.3 Lands Acquisition Process			
1.	The process for acquiring lands.	Volume 2 Section 5.4.1, 5.4.2	--
2.	The timing of acquisition and current status.	Volume 2 Section 5.4.3	--
3.	The status of service of section 87(1) notices.	Volume 2 Section 5.4.4	--
A.4.4 Land Acquisition Agreements			
1.	A sample copy of each form of agreement proposed to be used pursuant to section 86(2) of the NEB Act.	Volume 2 Section 5.4.2	--
2.	A sample copy of any proposed fee simple, work space, access or other land agreement.	Volume 2 Section 5.5.2	--
A.4.5 Section 87 Notices			
1.	A sample copy of the notice proposed to be served on all landowners pursuant to section 87(1) of the NEB Act.	Volume 2 Section 5.4.4, Appendix D	--
2.	Confirmation that all notices include a copy of Pipeline Regulation in Canada: A Guide for Landowners and the Public.	Volume 2 Section 5.4.4	--
A.4.6 Section 58 Application to Address a Complaint			
1.	The details of the complaint and describe how the proposed work will address the complaint.	N/A	N/A

CONCORDANCE TABLE WITH THE CEA ACT, 2012

CEA Act, 2012 Requirement	Section in CEA Act, 2012	Application Volume and Section
The environmental effects of the designated project, including:		
the environmental effects of malfunctions or accidents that may occur in connection with the designated project;	s.19.1(a)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Section 7.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Section 7.0 Volume 7 Risk Assessment and Management of Pipeline and Facility Spills Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Sections 4.3 and 5.0
any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out;	s.19.1(a)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Section 8.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Section 8.0 Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Section 4.4
the significance of the effects referred to in paragraph (a);	s.19.1(b)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Sections 7.0 and 8.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Sections 7.0 and 8.0 Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Sections 4.3 and 4.4
comments from the public – or, with respect to a designated project that requires that a certificate be issued in accordance with an order made under section 54 of the <i>National Energy Board Act</i> , any interested party – that are received in accordance with this act;	s.19.1(c)	Volume 3A Public Consultation Volume 3B Aboriginal Engagement Volume 3C Landowner Relations Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Section 3.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Section 3.0 Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Section 3.0
mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project;	s.19.1(d)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Sections 7.0 and 8.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Sections 7.0 and 8.0 Volume 5C ESA – Biophysical Technical Reports Volume 5D ESA - Socio-economic Technical Reports Volume 6B Pipeline Environmental Protection Plan Volume 6C Facilities Environmental Protection Plan Volume 6D Westridge Marine Terminal Environmental Protection Plan Volume 6E Environmental Alignment Sheets Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Sections 4.3, 4.4 and 5.0 Volume 8B Technical Reports
the requirements of the follow-up program in respect of the designated project;	s.19.1(e)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Section 10.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Section 10.0
the purpose of the designated project;	s.19.1(f)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> • Section 2.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Section 2.0 Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Section 1.1

CONCORDANCE TABLE WITH THE CEA ACT, 2012

CEA Act, 2012 Requirement	Section in CEA Act, 2012	Application Volume and Section
alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alternative means;	s.19.1(g)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Sections 2.0 and 4.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> Sections 2.0 and 4.0 Volume 8A Marine Transportation: <ul style="list-style-type: none"> Section 2.2
any change to the designated project that may be caused by the environment;	s.19.1(h)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Section 7.10 Volume 8A Marine Transportation: <ul style="list-style-type: none"> Section 4.3
the results of any relevant study conducted by a committee established under section 73 or 74; and	s.19.1(i)	N/A
any other matter relevant to the environmental assessment that the responsible authority, or, – if the environmental assessment is referred to a review panel – the Minister, requires to be taken into account.	s.19.1(j)	Volume 8A Marine Transportation Volume 8B Technical Reports Volume 8C TERMPOL Reports These volumes take into consideration the <i>Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project</i> (September 10, 2013) (NEB 2013)
The environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge.	s 19.3	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Sections 5.0, 6.0, 7.0 and 8.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 5D ESA - Socio-economic Technical Reports Volume 8A Marine Transportation: <ul style="list-style-type: none"> Sections 4.2, 4.3 and 4.4 Volume 8B Technical Reports
Subsection 5(1) of <i>CEA Act, 2012</i> defines environmental effects as a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:		
fish as defined in section 2 of the <i>Fisheries Act</i> and fish habitat as defined in subsection 34(1) of that <i>Act</i> ;	s.5(1)(a)(i)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 8A Marine Transportation: <ul style="list-style-type: none"> Sections 4.2, 4.3, 4.4 and 5.0 Volume 8B Technical Reports
aquatic species as defined in subsection 2(1) of the <i>Species at Risk Act</i> ;	s.5(1)(a)(ii)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 8A Marine Transportation: <ul style="list-style-type: none"> Sections 4.2, 4.3, 4.4 and 5.0 Volume 8B Technical Reports
migratory birds as defined in subsection 2(1) of the <i>Migratory Birds Convention Act, 1994</i> , and	s.5(1)(a)(iii)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Sections 5.0, 6.0, 7.0 and 8.0 Volume 5C ESA - Biophysical Technical Reports Volume 8A Marine Transportation: <ul style="list-style-type: none"> Sections 4.2, 4.3, 4.4 and 5.0 Volume 8B Technical Reports
any other component of the environment that is set out in Schedule 2.	s.5(1)(a)(iv)	N/A
Subsection 5(1) of the <i>CEA Act, 2012</i> defines environmental effects as (b) a change that may be caused to the environment that would occur		
on federal lands,	s.5(1)(b)(i)	Volume 5A ESA - Biophysical: <ul style="list-style-type: none"> Section 7.0 Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> Section 7.0
in a province other than the one in which the <i>act</i> or thing is done or where the physical activity, the designated project or the project is being carried out, or	s.5(1)(b)(ii)	N/A No changes are anticipated in provinces other than Alberta and BC in relation to the ESA.
outside Canada.	s.5(1)(b)(iii)	Volume 8A Marine Transportation: <ul style="list-style-type: none"> Sections 4.3, 4.4 and 5.0
Subsection 5(1) of the <i>CEA Act, 2012</i> defines environmental effects as (c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on:		

CONCORDANCE TABLE WITH THE CEA ACT, 2012

CEA Act, 2012 Requirement	Section in CEA Act, 2012	Application Volume and Section
health and socio-economic conditions;	s.5(1)(c)(i)	Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D ESA - Socio-economic Technical Reports Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Sections 4.3 and 4.4 Volume 8B Technical Reports
physical and cultural heritage;	s.5(1)(c)(ii)	Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Sections 5.0, 6.0 and 7.0
the current use of lands and resources for traditional purposes; or	s.5(1)(c)(iii)	Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Sections 5.0, 6.0, 7.0 and 8.0 Volume 5D ESA - Socio-economic Technical Reports Volume 8A Marine Transportation: <ul style="list-style-type: none"> • Sections 4.3 and 4.4 Volume 8B Technical Reports
any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	s.5(1)(c)(iv)	Volume 5B ESA - Socio-economic: <ul style="list-style-type: none"> • Sections 5.0, 6.0 and 7.0



ENVIRONMENTAL COMPLIANCE FOR THE TRANS MOUNTAIN PIPELINE ULC TRANS MOUNTAIN EXPANSION PROJECT

December 2013

ESA-NEB-TERA-00006A

Prepared for:



TRANS MOUNTAIN

Trans Mountain Pipeline ULC

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

Prepared by:



TERA Environmental Consultants
Suite 1100, 815 - 8th Avenue S.W.
Calgary, Alberta T2P 3P2
Ph: 403-265-2885

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION.....	1-1
1.1 Overview of the Project.....	1-1
1.2 Purpose of Plans, Processes and Programs.....	1-1
1.3 Overview of Volume 6A.....	1-2
2.0 ENVIRONMENTAL PROTECTION.....	2-1
2.1 Trans Mountain Commitment to Environmental Protection.....	2-1
3.0 ENVIRONMENTAL COMPLIANCE PROGRAM.....	3-1
3.1 Goals.....	3-1
3.2 Environmental Requirements and Commitments.....	3-1
3.3 Need for Monitoring.....	3-2
3.4 Organization Management and Oversight.....	3-2
3.4.1 Roles and Responsibilities for Environmental Compliance.....	3-2
3.4.2 Working With Kinder Morgan Canada Environment, Health and Safety Coordinators.....	3-7
3.4.3 Environmental Inspectors and Resource Specialists.....	3-7
3.4.4 Issue Monitoring During Construction.....	3-7
3.4.5 Environmental Compliance Audits.....	3-7
3.5 Reporting and Notifications.....	3-8
3.6 Document Control and Management.....	3-10
3.7 Environmental Compliance Plan.....	3-10
4.0 APPROACH TO ENVIRONMENTAL MANAGEMENT.....	4-1
4.1 Environment, Health and Safety Management System.....	4-1
4.1.1 Applicability of the Environment, Health and Safety Management System.....	4-3
4.2 Management Oversight and Quality Assurance.....	4-3
4.3 Environmental Planning and Permitting.....	4-4
4.4 Commitment to Team Work and Joint Problem Solving.....	4-4
4.5 Environmental Field Presence.....	4-4
4.6 Responsive Communication.....	4-4
4.7 Responsibility for Compliance at all Levels of the Project.....	4-5
5.0 PRE-CONSTRUCTION ACTIVITIES.....	5-1
5.1 Contractor Bid Process.....	5-1
5.2 Construction Kick-Off Meeting.....	5-1
5.3 Development of the Environmental Compliance Plan.....	5-1
5.4 Marking Environmental Features.....	5-1
5.5 Pre-Construction Photographic Record.....	5-1
6.0 ENVIRONMENTAL EDUCATION.....	6-1
6.1 All Construction Personnel and Visitors.....	6-1
6.2 Supervisory Construction Personnel and Trans Mountain Inspectors.....	6-1
6.3 Supervisory Construction Personnel, Construction Managers and Environmental Inspectors.....	6-1
6.4 Site-Specific Training and Refresher Training.....	6-2
7.0 ENVIRONMENTAL INSPECTION DURING CONSTRUCTION.....	7-1
7.1 Environmental Inspection Program Description.....	7-1
7.2 Environmental Inspector Qualifications and Duties.....	7-1
7.3 Communication and Reporting.....	7-2
7.3.1 Environmental As-Built Report.....	7-2
8.0 ISSUE MONITORING DURING CONSTRUCTION.....	8-1

8.1	Environmental Commitment and Permit Tracking	8-1
8.2	Environmental Issues Tracking	8-1
8.3	Environmental Emergency Response.....	8-1
9.0	POST-CONSTRUCTION ENVIRONMENTAL MONITORING	9-1
9.1	Initial Post-Construction Report	9-1
9.2	Construction Right-of-Way Inspection	9-1
9.3	Criteria for Success.....	9-2
9.4	Leaseholder/Landowner/Regulatory Authority Consultation	9-4
9.5	Physical Environment, Terrain and Soils Assessment	9-4
9.6	Vegetation Monitoring	9-4
	9.6.1 Old Growth Management Areas	9-6
9.7	Wetland Monitoring	9-6
9.8	Watercourse Monitoring	9-7
9.9	Wildlife and Wildlife Habitat Monitoring.....	9-8
9.10	Noise Monitoring	9-8
9.11	Air Monitoring	9-9
9.12	Water Well Monitoring.....	9-9
9.13	Selection of Remedial Measures	9-9
9.14	Operations and Maintenance Activities.....	9-10
9.15	Documentation and Reporting	9-10
9.16	TMX - Anchor Loop Project Post-Construction Environmental Monitoring.....	9-10
10.0	REFERENCES.....	10-1

LIST OF FIGURES

Figure 2.1-1	Kinder Morgan Canada Environment, Health and Safety Policy	2-2
Figure 3.3-1	Preliminary Environmental Compliance Organizational Chart.....	3-3

LIST OF TABLES

Table 3.3-1	Roles and Responsibilities.....	3-4
-------------	---------------------------------	-----

ABBREVIATIONS AND ACRONYMS

BC	British Columbia
CPCN	Certificate of Public Convenience and Necessity
DFO	Fisheries and Oceans Canada
EHS	Environment, Health and Safety
EPP	Environmental Protection Plan
KMC	Kinder Morgan Canada Inc.
MOC	Management of Change
NEB	National Energy Board
<i>NEB Act</i>	<i>National Energy Board Act</i>
<i>NEB OPR</i>	<i>National Energy Board Onshore Pipeline Regulations</i>
OGMA	Old Growth Management Area
PCEM Program	Post-Construction Environmental Monitoring Program
the Project / TMEP	Trans Mountain Expansion Project
TMPL	Trans Mountain pipeline
Trans Mountain	Trans Mountain Pipeline ULC
TWS	temporary workspace

1.0 INTRODUCTION

1.1 Overview of the Project

Trans Mountain Pipeline ULC (Trans Mountain) is a Canadian corporation with its head office located in Calgary, Alberta. Trans Mountain is a general partner of Trans Mountain Pipeline L.P., which is operated by Kinder Morgan Canada Inc. (KMC), and is fully owned by Kinder Morgan Energy Partners, L.P. Trans Mountain is the holder of the National Energy Board (NEB) certificates for the Trans Mountain pipeline system (TMPL system).

The TMPL system commenced operations 60 years ago and now transports a range of crude oil and petroleum products from Western Canada to locations in central and southwestern British Columbia (BC), Washington State and offshore. The TMPL system currently supplies much of the crude oil and refined products used in BC. The TMPL system is operated and maintained by staff located at Trans Mountain's regional and local offices in Alberta (Edmonton, Edson, and Jasper) and BC (Clearwater, Kamloops, Hope, Abbotsford, and Burnaby).

The TMPL system has an operating capacity of approximately 47,690 m³/d (300,000 bbl/d) using 23 active pump stations and 40 petroleum storage tanks. The expansion will increase the capacity to 141,500 m³/d (890,000 bbl/d).

The proposed expansion will comprise the following:

- Pipeline segments that complete a twinning (or “looping”) of the pipeline in Alberta and BC with about 987 km of new buried pipeline.
- New and modified facilities, including pump stations and tanks.
- Three new berths at the Westridge Marine Terminal in Burnaby, BC, each capable of handling Aframax class vessels.

The expansion has been developed in response to requests for service from Western Canadian oil producers and West Coast refiners for increased pipeline capacity in support of growing oil production and access to growing West Coast and offshore markets. NEB decision RH-001-2012 reinforces market support for the expansion and provides Trans Mountain the necessary economic conditions to proceed with design, consultation, and regulatory applications.

Application is being made pursuant to Section 52 of the *National Energy Board Act (NEB Act)* for the proposed Trans Mountain Expansion Project (referred to as “TMEP” or “the Project”). The NEB will undertake a detailed review and hold a Public Hearing to determine if it is in the public interest to recommend a Certificate of Public Convenience and Necessity (CPCN) for construction and operation of the Project. Subject to the outcome of the NEB Hearing process, Trans Mountain plans to begin construction in 2016 and go into service in 2017.

Trans Mountain has embarked on an extensive program to engage Aboriginal communities and to consult with landowners, government agencies (e.g., regulators and municipalities), stakeholders, and the general public. Information on the Project is also available at www.transmountain.com.

1.2 Purpose of Plans, Processes and Programs

The purpose of the environmental compliance strategy is to ensure environmental compliance and stewardship in all phases of the Project. Environmental compliance is achieved through various programs (including compliance tracking, inspection, education and training) in the pre-construction, construction and operations phases of the Project.

The purpose of the environmental training program is as follows:

- to affirm Trans Mountain's environmental commitment to all inspectors, supervisors and managers;
- to provide an overview of the spread-specific resource issues and compliance requirements;

- to clarify roles and responsibilities of key Project personnel;
- to emphasize the role of Trans Mountains' supervisors and construction, technical and lead activity inspectors in supporting the environmental program; and
- to establish clear Project expectations.

The objective of the communication and reporting program is to ensure maintenance of a comprehensive compliance record for the Project and for effective communication of information between compliance management personnel and field staff.

The purpose of the inspection program is to ensure follow through on environmental commitments and compliance with legislation and permit conditions, in addition to providing continuous feedback on compliance issues to responsible parties and rectification of non-compliance.

1.3 Overview of Volume 6A

Environmental protection, environmental compliance and Trans Mountain's approach to environmental management are described in Sections 2.0 to 4.0.

Pre-construction activities and environmental education that Trans Mountain has developed for this Project are described in Sections 5.0 and 6.0, respectively.

Sections 7.0 and 8.0 describe environmental inspection and issue monitoring during construction to ensure that the recommended protection measures and commitments made in the application are implemented throughout the construction phase of the Project.

Section 9.0 describes the practices and programs that Trans Mountain will develop to ensure that the recommended protection measures and commitments made in the application are implemented throughout post-construction. A Post-Construction Environmental Monitoring (PCEM) Program will include an assessment of revegetation, drainage reclamation, erosion control, compaction, disturbance to public access, terrain stability and any weed problem areas along the construction right-of-way and facilities. The PCEM Program will take into consideration pre-construction conditions, the conditions of adjacent lands and any unresolved issues identified in the Environmental As-Built Report.

Information contained within this volume addresses Guide A.2.8 of the NEB *Filing Manual* (NEB 2013) (Inspection, Monitoring and Follow-up), which requires an applicant to file a description of inspection plans to ensure compliance with biophysical and socio-economic commitments, consistent with sections 48, 53 and 54 of the *National Energy Board Onshore Pipeline Regulations (NEB OPR)*, a project-specific environmental protection plan (EPP), a surveillance and monitoring program, a description of the particular elements in the application that are of greater concern and evaluation of the need for a more in-depth monitoring program and for *CEA Act, 2012* designated physical activities, a description of which elements and monitoring procedures would constitute follow-up under the *CEA Act, 2012*. For the discussion of follow-up, see Sections 10.0 of Volumes 5A and 5B.

2.0 ENVIRONMENTAL PROTECTION

2.1 Trans Mountain Commitment to Environmental Protection

Trans Mountain is committed to construction of the pipeline and facilities in a manner which minimizes environmental effects and ensures that the Project complies with all environmental legislation, applicable permit conditions, regulatory requirements, Project EPPs, reclamation plans and other Project specifications. High standards of environmental protection planning have been completed and will continue for the duration of the Project. Environmental requirements will be incorporated into all business decisions and contract documents related to the Project.

Trans Mountain will implement the KMC Environment, Health and Safety (EHS) Policy (Figure 2.1-1).

Figure 2.1-1 Kinder Morgan Canada Environment, Health and Safety Policy



Environment, Health and Safety Policy

Every employee is expected to share Kinder Morgan's commitment to pursue the goal of not harming people, protecting the environment, using material and energy efficiently and promoting best practices, thereby earning the confidence of customers, security holders and society at large, being a good neighbor and contributing to sustainable development. Kinder Morgan's policy is to comply with all health, safety, security and environmental laws, rules and regulations, not just because it is legally required but also because we believe it is the responsible way to conduct our business. Kinder Morgan has systems in place that prepare for emergencies and procedures that coordinate our response plans with emergency response organizations in the communities where we operate. Kinder Morgan has a systematic approach to health, safety, security and environmental management designed to ensure compliance with the law, to train employees to be aware of and meet their responsibility for protection of health, safety and the environment, and to achieve continuous performance improvement. In addition to the Kinder Morgan commitment, contractors are required and joint ventures under Kinder Morgan's operational control are expected to apply this policy. Employees, supervisors or operational managers who knowingly engage in or condone environmental health or safety violations are subject to disciplinary action including suspension or termination.

A handwritten signature in black ink, appearing to read 'I. Anderson'.

Ian D. Anderson

President

Kinder Morgan Canada

A Member of the Kinder Morgan Group of Companies

November 2012

3.0 ENVIRONMENTAL COMPLIANCE PROGRAM

The purpose of the Environmental Compliance Program is to describe Trans Mountains' plans and procedures that are in place or will be in place to ensure Project activities are conducted in compliance with environmental regulatory requirements and corporate expectations. The program is intended to be the bridge between the EHS Policy and Environmental Management System and the TMEP commitments in EPPs, the Reclamation Management Plan, the PCEM Program, and all other Project environmental documentation and permits.

The Environmental Compliance Program provides guidance on maintaining cooperative working relationships, training requirements and effective communication between environmental and construction personnel, contractors and regulatory authorities.

Standardized procedures have been developed for reporting relationships, and roles and responsibilities of TMEP personnel. The program also sets out a framework for Management of Change (MOC) process.

Environmental compliance requires: excellent communication to share information on commitments made and permit conditions; an effective high quality compliance team; suitable training and orientation programs designed for specific audiences; sound MOC processes; and the presence of strong environmental inspection and monitoring procedures and teams on-site.

3.1 Goals

The goals of the Environmental Compliance Program are to:

- have embedded in the Project management organization clearly defined roles and responsibilities regarding environmental compliance;
- allow efficient implementation of legislative requirements, permit and authorization conditions, EPPs, Reclamation Plan and PCEM commitments to achieve compliance;
- have an environmental commitment tracking database ;
- allow easy access to the Project compliance records;
- guide cooperation between environmental inspection, engineering and construction management;
- guide cooperation for site inspections by regulatory authorities and environmental compliance audits; and
- obtain sign off by the accountable officer of the company.

3.2 Environmental Requirements and Commitments

Protection of the environment is a key performance objective of Trans Mountain and is the basis for the federal, provincial and municipal permits and authorizations for the Project. To achieve environmental protection, Trans Mountain will implement the steps KMC has established for management oversight, issue identification, development of action plans in order to resolve issues and management procedures to ensure action plans are implemented.

The Pipeline EPP (Volume 6B), Facilities EPP (Volume 6C) and Westridge Marine Terminal (Volume 6D) provide detailed mitigation plans for all Project construction activities. These mitigation measures were developed in response to issues that were identified during Project planning, through discussions with regulatory authorities, stakeholder consultation and Aboriginal engagement. Additional mitigation measures may be identified through permits from federal, provincial and municipal authorities. The EPPs (Volumes 6B to 6D), the Environmental Alignment Sheets (Volume 6E) and Environmental Facility Drawings (Volumes 6C and 6D) will be incorporated into bid documents and contracts.

To meet environmental commitments and permit requirements during Project activities, Trans Mountain will implement an environmental inspection and monitoring program that includes management oversight,

on-site environmental inspection, various environmental training programs for all on-site personnel and access to other environmental resources (e.g., wildlife biologists, water quality monitors) on an as needed basis.

Compliance will be achieved through direct participation and commitment from the Trans Mountain Project management team.

3.3 Need for Monitoring

Monitoring includes environmental inspection, commitment tracking by environmental specialists to ensure that commitments are met and that procedures and mitigation measures are effective at protecting the environment. Monitoring will allow issues to be identified, tracked and resolved. An Issues Tracking List will be developed for the Environmental Inspection team to track and record the resolution of issues. Efforts will be made by the Environmental Inspection team to resolve issues before they escalate into non-compliance.

3.4 Organization Management and Oversight

Pursuant to the *NEB OPR*, Trans Mountain has an integrated management system that outlines the policies, processes and procedures for the planning and execution of its business in a manner that provides protection of people, property and the environment. KMC's EHS Management System, which Trans Mountain has adopted, is described in Section 4.1 below.

3.4.1 Roles and Responsibilities for Environmental Compliance

The construction and commissioning of the Project is the responsibility of KMC's Major Projects Group. The Major Projects Group has been assembled to oversee the design and execution of large expansion projects. The roles and responsibilities of the relevant KMC/Trans Mountain personnel related to environmental compliance are provided below. These roles and responsibilities will be updated once construction plans are further developed.

Figure 3.3-1 provides an organization chart for environmental compliance. Table 3.3-1 provides environmental roles and responsibilities.

**Figure 3.3-1
Preliminary Environmental Compliance
Organizational Chart**

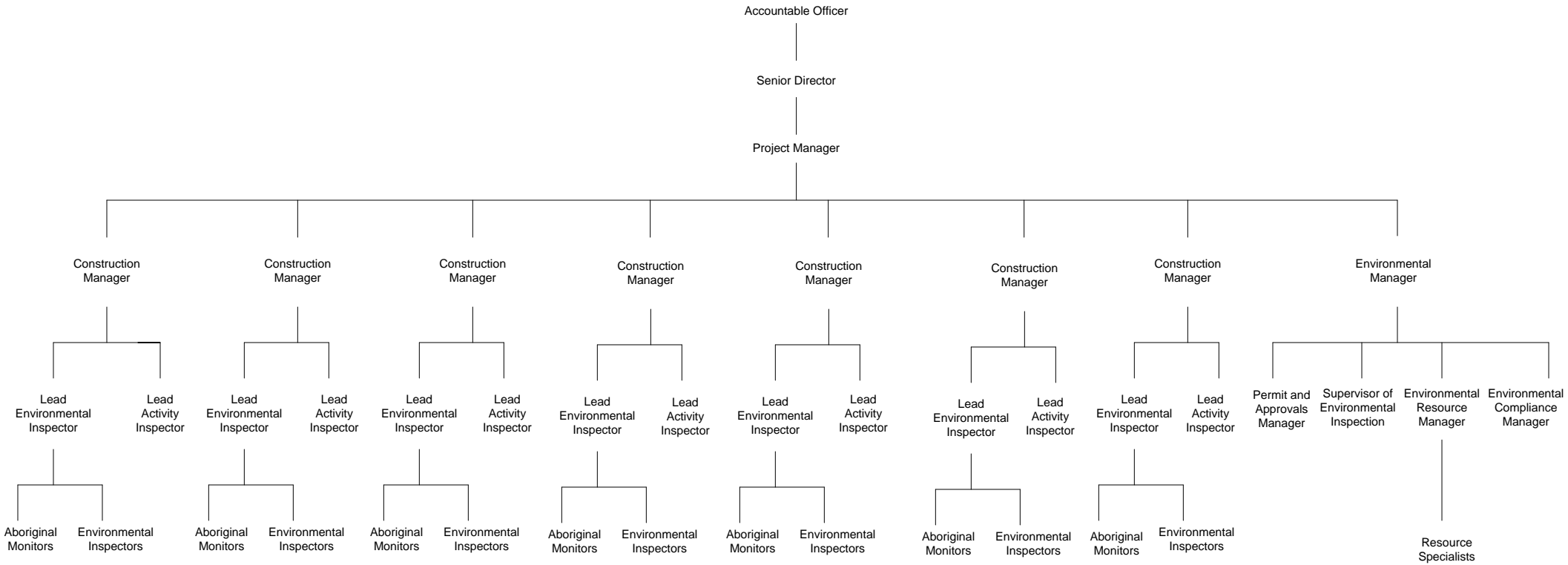


TABLE 3.3-1
ROLES AND RESPONSIBILITIES

Role	Responsibilities
Accountable Officer	<ul style="list-style-type: none"> • Ensure Trans Mountain has documented policies and goals and continues to be committed to ongoing use of the EHS Management System. • Demonstrate leadership and direction to the environmental program. • Ensure all Trans Mountain and contractor staff are aware of the Environmental Inspector(s)' environmental responsibilities and receive training appropriate to their roles on the Project. • In coordination with legal services, responsible for the NEB application for "Leave to Open" prior to putting the TMEP pipeline and facilities into service. • Responsible for ensuring applicable conditions of the NEB CPCN are signed-off.
Senior Director	<ul style="list-style-type: none"> • Provide leadership and direction to the environmental programs for the Major Projects Group. • Assume ultimate authority for environmental performance for the Major Projects Group. • Ensure there are sufficient, qualified and trained personnel to conduct the Project in an environmentally responsible manner to ensure environmental compliance. • Confirm NEB CPCN conditions have been met and appropriate environmental authorizations are in place. • Ensure that suitable environmental programs (Inspection and Compliance) are in place to ensure commitments are met. • Ensure that EPPs, Environmental Alignment Sheets, Environmental Facility Drawings and permits are included in contract bid documents. • Ensure that contractors have an opportunity to tour environmentally sensitive areas during the bid process. • Ensure environmental compliance audits are implemented and action items for the Project are followed through. • Report on environmental performance to Executives and the Director of EHS. • Ensure MOC procedures are in place and followed.
Project Manager	<ul style="list-style-type: none"> • Ensure contractors understand the EPPs and environmental sensitivities of the Project during contracting process. • Resolve conflicts between construction management and environmental considerations. • Review environmental compliance reports, including incident reports and follow-up actions. • Ensure environmental performance and compliance of the contractors is a topic of discussion at their regularly scheduled meetings. • Ensure environmental responsibilities are integrated in all levels of the Project organization.
Environmental Manager	<ul style="list-style-type: none"> • Report to the Project Manager on environmental compliance. • Work closely with the Environmental Compliance Manager in implementing the Environmental Compliance Program and Environmental Compliance Plan to ensure environmental approvals and permits for construction are acquired and environmental commitments are met. • Provide overall environmental coordination and communication for the Project. • Work with the Senior Director and the Project Manager to ensure sufficient, qualified and trained personnel are in place to implement the Environmental Compliance Program and Environmental Compliance Plan. • Ensure KMC policies that have been adopted by Trans Mountain and the Environmental Manual are available and adhered to. • Review Environmental Inspection reports from the Supervisor of Environmental Inspection to evaluate Project resource needs and compliance issues. • Develop and oversee environmental education program for the Project. • Conduct ongoing consultation with regulatory authorities. • Oversee the work of the Environmental Compliance Manager, the Permit and Approvals Manager, and the Environmental Resource Manager. • Work closely with the Environmental Compliance Manager to evaluate processes to ensure they are working effectively to ensure compliance. • Help to resolve conflicts between construction activities and environmental considerations. • Conduct site visits to ensure inspection and compliance programs are effective. • Assist with training of Environmental Inspector(s) on communications, reporting requirements and permit conditions. • Review weekly compliance report from the Environmental Compliance Manager.

TABLE 3.3-1 Cont'd

Role	Responsibilities
Environmental Compliance Manager	<ul style="list-style-type: none"> • Report to the Environmental Manager regarding environmental compliance issues. • Develop, maintain and ensure understanding and implementation of the Environmental Compliance Plan. • Coordinate and facilitate environmental compliance audits. • Develop and maintain the environmental commitment tracking table that will be used to develop an issue tracking list that will be used in the Environmental As-built Report. • Accompany regulatory authority representatives on field reviews/inspections, where warranted. • Provide advice on interpreting the environmental compliance requirements and ensuring compliance with Project specifications and environmental permits. • Use the MOC procedures to approve or deny requests for environmental changes generated by the field. • Receive environmental non-compliance reports and relay information and response actions to internal parties. • Work with KMC's Emergency Response Line to ensure authority notifications are made in cases of reportable incidents (e.g., releases). • Ensure spill reports are completed. • Communicate and address environmental issues raised by regulatory authorities. • Prepare the weekly compliance report for the Environmental Manager and Supervisor of Environmental Inspection. • Report non-compliances and spills to regulatory authorities.
Permit and Approvals Manager	<ul style="list-style-type: none"> • Oversee all elements of environment permit acquisition and compliance. • Confirm understanding of permit requirements with regulatory authorities and handle any permit-related issues. • Determine if regulatory approval is necessary for substantial changes to mitigation measures. • Work with construction and engineering teams to determine and gather the information necessary to resolve environmental issues and acquire new permits or permit revisions. • Ensure permit binders are kept up-to-date in field offices.
Environmental Resource Manager	<ul style="list-style-type: none"> • Coordinate the work of the resource specialists to handle specific environmental sensitivities. • Plan environmental specialist participation in the construction program. • Ensure schedule windows for fish and wildlife are met. • Ensure appropriate equipment and materials are on-site to assess compliance with commitments.
Supervisor of Environmental Inspection	<ul style="list-style-type: none"> • Coordinate with Lead Activity Inspectors on a daily basis. • Work with the Construction Manager to resolve on-site conflicts that may occur from time to time between contractors, Technical Inspectors and Environmental Inspector(s) on environmental issues. • Communicate clearly and on a timely basis with the Environmental Manager and Environmental Compliance Manager regarding major environmental issues, including serious non-compliance events. • Coordinate with the Environmental Manager to ensure appropriate environmental resources are on-site. • Provide a daily summary report to the Project Manager, Environmental Manager and Environmental Compliance Manager on contractor compliance with Project mitigation requirements, permit conditions and environmental specifications on a daily basis.
Lead Activity Inspector	<ul style="list-style-type: none"> • Assign environmental inspection activities on a daily basis. • Ensure the construction right-of-way is marked and flagged, as required, prior to construction progressing through sensitive areas. • Liaise with regulatory authorities to address concerns, maintain positive and effective communications with authority representatives and facilitate agreement in the field. • Communicate clearly and on a timely basis with the Supervisor of Environmental Inspection regarding major environmental issues and non-compliance events. • Have the authority, in consultation with the Environmental Inspector(s), to halt construction during specific non-compliance activities that have potential to have a negative effect on the environment. • Communicate with the Environmental Resource Manager on resource specialists, as required, for specific activities and environmentally sensitive areas. • Coordinate with the Environmental Compliance Manager, as needed, on interpretation of permits and compliance issues throughout the Project. • Inspect and document contractor compliance with Project mitigation requirements, permit conditions and environmental specifications on a daily basis. • Oversee environmental training activities for the construction spread. At the daily construction meeting, discuss issues or trends noted in the weekly Environmental Compliance Report prepared by the Environmental Compliance Manager.

TABLE 3.3-1 Cont'd

Role	Responsibilities
Environmental Inspector	<ul style="list-style-type: none"> • Document environmental compliance and environmental activities on a daily basis and maintain a photographic record. • Responsible for environmental issues resolution, field decision making and reporting. • Coordination with the Construction Manager(s), Lead Activity Inspectors, construction contractor representatives and Environmental Inspector(s). • Ensure the Project is constructed in compliance with environmental conditions and requirements contained with the Project application, environmental specifications, standards and permits through inspection and documentation/photographs. • Have the authority, in consultation with the Lead Activity Inspectors, to halt construction during specific non-compliance activities that have potential to have a negative effect on the environment. • Inform Lead Activity Inspectors, daily, of the environmental issues in their area. • Work closely with construction contractor representatives to discuss environmental sensitivities and commitments that must be met. • Assess work areas ahead of construction noting concerns and site-specific issues, site conditions and provide advance notice to the Construction Manager and Lead Activity Inspectors to allow proactive planning of the work to avoid major impacts. • Enforce compliance with environmental legislation, commitments, approvals and permits. • Keep track of issues not immediately resolved by entering them into the Issues Tracking List. • Provide listed issues to the contractors to resolve in an agreed timeline before they escalate into a non-compliance.
Aboriginal Monitor	<ul style="list-style-type: none"> • Work with the Environmental Inspector(s) to provide traditional knowledge to the construction program to ensure protection of the environment. • Discuss upcoming traditional and western science elements with the Environmental Inspector(s) to ensure protection and monitoring. • Monitor mitigation success in protecting the environment.
EHS Department	<ul style="list-style-type: none"> • Review environment performance. • Ensure maintenance and implementation of the Environmental Management System. • Participate in monthly safety and environmental stewardship meetings to facilitate timely discussion of joint environmental issues and expectations. • The KMC Legal Department will commission environmental compliance audits, which will be coordinated by the EHS Department using the services of a third-party consulting firm, to provide to the Lead Auditor. Ancillary auditors will be provided by KMC.
Construction Manager	<ul style="list-style-type: none"> • Ensure compliance with company specifications, permit conditions, construction contracts and applicable codes. • Notify Project Manager and Environmental Manager of changes to Project work schedule as defined in the application or permit using the MOC process. • Actively participate with the Environmental Manager and Environmental Compliance Manager to evaluate and improve environmental compliance. • Coordinate with Lead Activity Inspectors on work schedules, environmental sensitivities, environmental resource needs and permit conditions. • Conduct ongoing consultation with regulatory authorities. • Read and understand the Environmental Compliance Plan and provide written acknowledgement. • Conduct Project construction meetings to ensure environmental compliance requirements are coordinated in daily activities.
Technical Inspectors	<ul style="list-style-type: none"> • Understand the environmental commitments associated with construction operations they are tasked with supervising. • Provide support in inspecting for and ensuring compliance with the environmental requirements of their construction activity. • Verify that environmental requirements and requests from Environmental Inspector(s) are carried out by their assigned crews. • Read and understand the Environmental Compliance Plan and provide written acknowledgement.
Engineering Manager	<ul style="list-style-type: none"> • Ensure construction plans and modifications to Project activities, schedules and issues are communicated in a timely manner to the appropriate personnel within the environment team by using the Project MOC process. • Ensure compliance with specifications, permit conditions and construction contracts and applicable codes.
Contractor Supervisors and Foreman	<ul style="list-style-type: none"> • Review and understand the environmental requirements prior to establishment of contracts and during all phases of construction. • Responsible for conducting the Project in an environmentally responsible manner and incorporating all Project environmental requirements into daily construction activities. • Verify all construction personnel attend environmental orientation prior to work on the construction right-of-way. • Attend environmental education sessions designed for on-site supervisors. • Implement EPP mitigation measures during construction. • Respond to Environmental and Lead Activity Inspector requests during construction to ensure compliance with Project environmental requirements. • Ensure work is performed in compliance with company specifications, contract documents, environmental permit/approval conditions, landowner line lists and applicable codes. • Read and understand the Environmental Compliance Plan and provide written acknowledgement.

TABLE 3.3-1 Cont'd

Role	Responsibilities
Resource Specialist	<ul style="list-style-type: none"> • Confirm if mitigation objectives have been met and provide feedback to the Supervisor of Environmental Inspection and Construction Manager. • Provide input to work plans of specific activities such as watercourse crossings, deterring wildlife from work area and soil handling (handling of specific environmental sensitivities). • Provide input in the event of an unanticipated discovery of valued resources such as a cultural resource site that was not previously mapped. • Assist the Environmental Inspector(s) as needed.

3.4.2 Working With Kinder Morgan Canada Environment, Health and Safety Coordinators

The Project is located within the boundaries of the regular operating district of KMC’s EHS Coordinators. While the Trans Mountain Project team is responsible for and has all the resources needed to conduct the work, some liaison with pipeline operation and maintenance personnel and the KMC EHS Coordinators is warranted to ensure the effects of Project construction on existing operations is minimized.

3.4.3 Environmental Inspectors and Resource Specialists

Section 7.2 provides the qualifications and duties of the Environmental Inspector(s).

The Environmental Inspector(s) are not expected to have expert training and experience in all environmental disciplines and, as such, will be supported by the resource specialists with discipline-specific expertise. Resource specialists will be available to assist the Environmental Inspector(s) either by telephone consultation or in the field. Resource specialists may also be called out to deal with planned events (e.g., relocation of rare plant), or in the event of an unanticipated discovery of valued resources such as a cultural resource site that was not previously mapped. Resource specialists will be available with specialized expertise in a variety of fields, including soil science, geotechnical engineering, wetlands, forestry, fisheries, water quality, botany, wildlife, archaeology and reclamation.

3.4.4 Issue Monitoring During Construction

Trans Mountain will carry out the Project in an environmentally responsible manner. In the event that a major environmental issue arises during construction for which no mitigation measures have been approved, the Supervisor of Environmental Inspection/Lead Activity Inspector(s), Construction Manager(s) and Environmental Manager will formulate a plan of action. Representatives from regulatory authorities will be invited to participate in planning variances when appropriate. The plan of action will include measures to both assess and mitigate the environmental effects. No substantial changes to the approved mitigation measures outlined in the EPPs will be made without the approval of the NEB or other regulatory authorities that have the relevant jurisdiction.

The MOC procedures will be followed to ensure all interested parties are aware of and consulted about the changes.

If the requirements of permits or the direction given by regulatory authorities are found to be in conflict with the EPPs or other previously filed regulatory applications (such as the TMX - Anchor Loop Project), an attempt will be made to resolve the discrepancy with available representatives of affected regulatory authorities. Environmental issues and the measures undertaken for the resolution of each issue will be recorded and tracked in daily reports and will be captured in the Environmental Issues Tracking List by the Environmental Compliance Manager. If issues remain unresolved following the implementation of remedial measures, the issue and location(s) in question and measures proposed to resolve the issue will be recorded in an Environmental As-built Report (see Sections 7.3.1 and 9.1).

3.4.5 Environmental Compliance Audits

Environmental compliance audits will be commissioned by the KMC Legal Department and will be administered by KMC’s EHS Department. A number of internal compliance audits are expected over the

life of the Project. The findings of the audits will be discussed with on-site personnel from Trans Mountain and the contractors at the conclusion of each audit event. This will be followed by a written report including corrective actions, where warranted.

The purpose of the environmental audits are to:

- a) Evaluate the status of compliance with applicable federal, provincial and municipal environmental legislation and permits;
- b) Identify areas of potential risk;
- c) Identify positive practices that may serve as a learning tool for other expansion projects and other Project activities; and
- d) Integrate permit compliance findings into a systems assessment of the Major Projects Group's environmental management practices and programs.

The audit process is as follows.

- The audit is coordinated by KMC's EHS Department who will determine the members of the audit team.
- Copies of the audit report will be forwarded to the Senior Director, Environmental Manager, Environmental Compliance Manager, Senior Legal Advisor and KMC's EHS Department.
- Audit findings will be tracked by the Senior Director with monthly status reports provided to the EHS Department.
- Responsibility for corrective actions will be assigned to appropriate Project personnel.

3.5 Reporting and Notifications

A number of reports and notifications will be required to document and track compliance. A general description of the reports and notifications are provided in this section.

Construction Communication Plan

Trans Mountain will develop a communication plan to facilitate a concise two-way information exchange between Project members, corporate head office departments, contractors and regulatory authorities in order to effectively manage the Project. The communication will also summarize the notifications required to regulatory authorities and the public.

Permit Binder

A full set of the NEB application binders and all supporting approval documentation (permits and authorizations) will be available on-site for the Environmental Inspection team and construction personnel. Copies of all federal, provincial and municipal environmental authorizations will be compiled in a permit binder to be maintained on-site during pre-construction activities, construction, and operations (*i.e.*, reclamation and post-construction monitoring). Copies of the permit book will also be available in the Trans Mountain Calgary office. The permit binder will be kept up to date by the Permit and Approvals Manager.

Commitment Tracking Table

A commitment tracking table will be developed by the Environmental Compliance Manager. The commitment tracking table will allow identification of commitments, incorporation of new commitments over time, identification of trends and a mechanism to ensure timely fulfillment of commitments as part of the Project.

The commitment tracking table will act as a compliance tool for the Environmental Manager and the Environmental Compliance Manager. The purpose is to capture all commitments made within the cycle of the Project and track them in a standardized format. Commitments to be included will be from:

- the NEB section 52 TMEP application, including the EPPs, Reclamation Management Plan, Environmental Facility Drawings (Volumes 6C and 6D) and Environmental Alignment Sheets (Volume 6E);
- commitments made through the NEB hearing process and at meetings or through other stakeholder communications/consultation; and
- conditions of approval in permits and authorizations from regulatory authorities.

The Environmental Compliance Manager will maintain the commitment tracking table at the construction offices. Environmental Inspection reports will be used to determine when a commitment has been completed. The table will be updated to indicate the commitment has been met and will be signed-off by the Supervisor of Environmental Inspection as they are completed.

The commitment tracking table will describe the commitment, the source of the commitment, the person responsible for the commitment, comments on the commitment, timeline for completion and Environmental Inspection sign-off.

Reporting of Environmental Non-Compliance

The Environmental Compliance Manager will manage environmental non-compliances through reporting, resolution and follow-up of any Non-Compliance Issues which arise during the pre-construction, construction and operations phases of the Project. The Lead Activity Inspector(s) will fill out an incident investigation form and will obtain sign-off from the contractors, Environmental Inspector(s) and Trans Mountain's Construction Manager(s). The non-compliance form will be forwarded to the Environmental Compliance Manager and the contractor's Project Manager within 24 hours of the event. The contractor will take ownership of the issue and will develop corrective actions. The Environmental Compliance Manager will review the corrective actions and will also review the follow-up prepared by the contractor. The follow-up report will state which actions were taken and will comment on the effectiveness of the actions.

Environmental Issues List

As issues arise they will be entered into the Environmental Issues List by the Environmental Inspector(s). The Environmental Inspector(s) will enter actions taken to resolve the issue and will indicate if the issue is resolved or not.

Agency Notifications

KMC's Non-Compliance Notification Process will be followed and regulatory authority contacts regarding non-compliance will be made by KMC's EHS Department following KMC protocol.

Notification to minimize interference with other land users and to inform appropriate regulatory authorities of time sensitive commitments will be made by the Environmental Compliance Manager or his/her designate. Details on the notifications required and the timing of notifications are provided in the EPPs (Volumes 6B, 6C and 6D). Copies of all notifications will be kept on-site in the environmental files.

Daily Environmental Inspection Reports

Environmental performance and compliance will be monitored and recorded using daily inspection reports which will be completed by each Environmental Inspector. These will be summarized by the Supervisor of Environmental Inspection and the summary will be provided to the Environmental Manager and Environmental Compliance Manager. The daily reports and the Supervisor of Environmental Inspections summary report will be provided to the Environmental Manager, Construction Manager, Project Manager and Environmental Compliance Manager on the morning of the following day.

These reports will be maintained at the job site by the Environmental Inspection Team and in Calgary by the Environmental Manager. These Environmental Inspection Reports will form the basis of the environmental section of the monthly construction progress reports to be filed with the NEB.

Environmental Inspector(s) will maintain a log of photographs of the TMEP sites taken during pre-construction, construction and post-construction activities. The photographs will provide an electronic record of the progression of construction, effectiveness of mitigation, visual evidence of non-compliance activities and any impacts that may occur and to document compliance resolution. Photographs will be forwarded with a log to the Environmental Compliance Manager. All photographs will be stored in electronic files.

Management of Change Process

Changes to construction practices, mitigation measures, procedures or standards need to be evaluated and managed to ensure that environmental risks remain acceptable and environmental practices are completed in compliance with documented requirements.

The MOC process covers any waivers or deviations to the work. The MOC process applies to changes recommended by any Project personnel including management, contractors, or consultants. Substantial changes to work plans will require approval through the MOC process. The MOC process ensures effective and consistent communication to respective Project groups of changes that will impact the schedule or environmental requirements of the Project.

The MOC process involves the following steps:

- initiate proposal for change;
- clarify what the change is;
- complete the MOC form;
- for changes effecting the environment, the MOC form will signed by the Environmental Manager, Environmental Compliance Manager, Project Manager and Construction Manager(s) and others, as required;
- the Environmental Compliance Manager will determine if regulatory approval is required for the change; and
- the Environmental Compliance Manager will undertake regulatory communication/request for approval of the change as required.

Weekly Compliance Reports

Weekly compliance reports will be compiled by the Environmental Compliance Manager, which will summarize any non-compliance events, include a summary of construction progress, listing of landowner issues/concerns and an updated watercourse crossing table. Photographs will be included as needed. The report will be provided to the Environmental Manager, Supervisor of Environmental Inspection, Project Manager and Construction Manager(s) each week for review. Any issues/trends will be brought forward at the next daily construction meeting by the Lead Activity Inspector(s).

3.6 Document Control and Management

Trans Mountain uses a Sharepoint document control system, which will be expanded for post application activities to allow efficient transmission and tracking of Project documents, approvals, MOC forms and various communications between the corporate offices, key construction offices and senior Project personnel. Document distribution protocols will be developed for hard copies, including lists of document owners and locations of documents. Personnel or offices listed as owners of particular Project documents will receive updates as required to ensure both hard copies and electronic documents are up-to-date.

3.7 Environmental Compliance Plan

An Environmental Compliance Plan will be developed by the Environmental Compliance Manager prior to the start of construction. Section 5.0 provides further details on the Environmental Compliance Plan.

4.0 APPROACH TO ENVIRONMENTAL MANAGEMENT

Protection of the environment is essential to the success of the Project and is a key performance objective of Trans Mountain. A major contributor toward protection of the environment is the establishment of an effective management system, implementation of management oversight, identification of environmental issues, development of plans to address issues and establish procedures to ensure the implementation of effective actions.

The EPPs (Volumes 6B, 6C and 6D) provide mitigation plans developed in response to issues identified during Project planning, stakeholder and community consultation, Aboriginal engagement and regulatory consultation.

Preliminary monitoring and inspection programs have been developed to ensure legislative requirements, environmental commitments and permit conditions are met. These programs include management oversight, in-field inspection and monitoring, and training for resource specialists, Lead Activity Inspectors and contractor supervisors. Reporting procedures have been developed for tracking environmental performance and non-compliance.

The roles and responsibilities of KMC corporate and Trans Mountain Project personnel have been developed and are provided in Section 3.3.1.

Compliance with the Environmental Compliance Plan will be mandatory for the Construction Manager(s), contractor supervisors and Lead Activity Inspectors. Those provided with the Environmental Compliance Plan will be asked to sign a form acknowledging the reader has read and understands the compliance plan.

4.1 Environment, Health and Safety Management System

Trans Mountain will implement the KMC EHS Management System. The EHS Management System is an integrated framework based on Section 6 of the 2013 *NEB OPR*. Pursuant to Section 6, KMC has developed a management system that outlines the policies, processes and procedures for the planning and execution of the core business of the organization in a manner that provides for the protection of people, property and the environment. The management system applies to the key program areas for which companies are responsible: safety; pipeline integrity; security; emergency management; and environmental protection. These programs all follow management system processes to anticipate, prevent, manage and mitigate conditions that have the potential to harm people, property or the environment throughout the lifecycle of the Project.

The EHS Management System is incorporated in an integrated framework based on:

- *NEB OPR*, Section 6;
- Canadian Standards Association Z1000-06;
- International Standards Organization 14001; and
- Occupational Health and Safety Assessment Series 18001.

The EHS Management System describes how the company operates in a way that minimizes risk to its employees, contractors, the public and the environment. The management system structure emphasizes the importance of EHS impact prevention and continuous performance improvement, rather than reaction and management of loss occurrences. Trans Mountain has documented policies and goals and is committed to the ongoing use of the EHS Management System.

KMC's EHS Management System, which has been adopted by Trans Mountain, is based on the aforementioned standards and is divided into the five sections described below.

1. Policy and Commitment

KMC has an EHS Policy that is:

- a) approved and endorsed by senior management;
- b) appropriate to the scale, nature and aspects/hazards/threats associated with its activities;
- c) includes a commitment to:
 - i. continual improvement;
 - ii. pollution and injury prevention; and
 - iii. compliance with EHS legislation;
- d) provides the framework for setting and reviewing EHS objectives and targets;
- e) is documented, implemented and maintained;
- f) is communicated to all workers; and
- g) is available to the public.

2. Planning

KMC has established, implemented and maintains a procedure to achieve the following:

- a) identify and ensure access to applicable legal and other requirements;
- b) determine if/how these legal requirements apply to its aspects/hazards/threats;
- c) periodically evaluate compliance with these requirements and resolve non-conformities; and
- d) communicate relevant requirements to interested parties within the company. KMC's EHS Management System also establishes and maintains a plan for achieving its objectives and targets that includes:
 - i. designation of responsibility for achieving the objectives and targets; and
 - ii. means and time frame by which they are achieved.

3. Implementation

KMC has established, implemented and maintains a procedure to achieve the following:

- a) communicate information about the policy and implementation plan to all levels in the company;
- b) determine extent of communication about environmental aspects and document its decision;
- c) identify training needs, provide training or take other action to meet these needs, and evaluate the effectiveness of the training. KMC staff are made aware of:
 - i. their roles and responsibilities and importance in achieving conformity with the EHS Policy and procedures and to the requirements of the management system;
 - ii. the consequences (EHS) of their work and the benefits of improved personal performance;
 - iii. training requirements associated with emergency preparedness and response; and
 - iv. the potential consequences of departure from specified procedures.

4. Checking and Corrective Action

KMC has established and will maintain procedures to monitor and measure performance on a regular basis. These checking and corrective actions include:

- a) both qualitative and quantitative measures appropriate to the needs of the organization;
- b) monitoring such that the goals and targets identified in the policy and planning activities are met; and
- c) monitoring the effectiveness of the controls put in place with measures that validate the performance of the system.

5. Management Review

Senior Management shall review the organizations management system at regular planned intervals to ensure its continued suitability, adequacy and effectiveness. The review shall include decisions and actions related to:

- a) the need for changes to the organizations policy and objectives;
- b) improvements in effectiveness;
- c) the extent to which objectives and targets have been met; and
- d) recommendations for improvement.

4.1.1 Applicability of the Environment, Health and Safety Management System

The EHS Management System applies to all functional areas of the KMC business unit, including, however, not limited to:

- operations and maintenance activities related to operating pipelines (including administrative duties);
- transportation activities related to the movement of equipment, personnel and supplies which are integral to the organization's productivity;
- construction activities related to the expansion of the organization's facilities and pipelines;
- product related issues, use, exposure to and disposal of waste materials; and
- existing EHS legacy issues resulting from past operations.

KMC's Environmental Manual applies to all Trans Mountain and KMC operations. A copy of the Environmental Manual will be kept on-site in construction offices.

4.2 Management Oversight and Quality Assurance

Support, oversight, reinforcement and evaluation of the effectiveness of the environmental compliance program and environmental inspection requires ongoing quality assurance assessment. KMC Management including the Director of EHS, Manager Environment (EHS), and the Environmental Compliance Manager will participate in Trans Mountain's Environmental Compliance Audits and reviews. Trans Mountain personnel, including senior management will conduct periodic field visits throughout the Project to evaluate the effectiveness of the environmental compliance program. Key areas for evaluation will be effectiveness of communication and reporting, resolution of issues and levels of compliance attained.

Environmental Inspector(s) will be expected to evaluate and document compliance and identify and record corrective actions and the effectiveness of those actions on a daily basis. The Environmental Inspector(s) will complete daily reports detailing compliance status of Project construction activities. Daily reports will identify compliance issues and resolutions for any issues noted. Timelines will be provided for resolution of issues and any follow-up and closure requirements for non-compliance issues will be noted.

The Lead Activity Inspector(s) provides a second level of field oversight to ensure the quality of the compliance program. The Lead Activity Inspector(s) will provide assistance with determining and developing resolution of non-compliance issues. The Lead Activity Inspector(s) can provide direction to avoid recurring non-compliance and ensure that all construction spreads learn for this non-compliance.

The Construction Manager(s), Environmental Compliance Manager and Environmental Manager will review the Environmental Inspectors' daily reports, looking for areas of non-compliance, resolution and follow up. The Environmental Compliance Manager will review all internal environmental audits and look for plans, procedures or approaches that could be improved and provide recommendations to the Environmental Manager and/or Construction Manager(s). Environmental issues will be tracked by Environmental Inspector(s) and the status of resolution will be recorded.

Regulatory authority/third party inspections and environmental audits will also provide quality checks on compliance components. These inspections will provide feedback on compliance issues and processes. Corrective Action Plans will be required in instances of non-compliance.

All non-compliance issues identified by the Project team and by external parties will be tracked in the compliance tracking database. Non-compliance issues will also be assessed, resolved and documented. Non-compliance trends will be used to identify areas where additional training or supervision may be required, and areas where MOC processes may be required.

4.3 Environmental Planning and Permitting

Trans Mountain will track all permits for the Project. The conditions on the permits will be reviewed with key personnel including the Environmental Inspector(s), supervisory personnel and contractors. Trans Mountain will attempt to resolve issues and conflicts regarding environmental permits prior to initiating the applicable work.

Copies of all environmental permits will be placed in permit binders to be kept at construction offices. Plans, drawings, protection plans, reclamation plans and other specifications will also be available at each construction office.

4.4 Commitment to Team Work and Joint Problem Solving

The Trans Mountain compliance team will include the Environmental Compliance Manager, Permit and Approvals Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s), Environmental Inspector(s), Construction Supervisors, resource specialists and TMEP Project Management. The team has shared responsibility for environmental compliance during every Project activity. The compliance team will ensure that incident reporting is accurate and timely. Instances of non-compliance will require the team to develop and implement responsive resolutions in an efficient manner. Issues will be addressed when they are minor, in order to avoid problems becoming more problematic.

4.5 Environmental Field Presence

The Environmental Inspector(s) will have a prominent presence on TMEP throughout pre-construction field reviews, during construction and post-construction activities. Environmental Inspector(s) will verify that work is conducted in an environmentally responsible manner and in compliance with the legislation, commitments and permits. The Environmental Inspector(s) will help facilitate the timely progression of construction by looking ahead to upcoming construction activities and anticipating issues, sensitivities and potential compliance challenges.

4.6 Responsive Communication

Daily meetings will be held between environmental and construction representatives. Communications will be professional and responsive at all times. All Project personnel will interact in a manner that allows clear, timely discussion of concerns, relaying and understanding of environmental sensitivities, issues identification and resolution. Lines of communication will be determined and upheld.

Clear and professional communication will also be required with outside organizations. The environment and construction team members will work closely with regulatory authority representatives to resolve concerns or issues in a thorough and efficient manner.

4.7 Responsibility for Compliance at all Levels of the Project

Trans Mountain will integrate responsibility for compliance with environmental commitments at all levels of the Project organization. Section 3.3.1 describes the roles and responsibilities for environmental compliance for key Project personnel. All personnel on Project sites will have completed an environmental orientation explaining compliance requirements. Hard hat stickers will be worn to confirm that orientation has been attended. Other key personnel will be trained in various aspects of environmental compliance depending on their role in ensuring environmental compliance. Environmental education programs are described in Section 6.0.

5.0 PRE-CONSTRUCTION ACTIVITIES

Project activities occurring prior to construction will also assist in achieving environmental compliance and will include the contractor bid process, construction kick-off meetings and preparing an Environmental Compliance Plan.

5.1 Contractor Bid Process

The bid documents will include copies of the EPPs (Volumes 6B to 6D), Environmental Facility Drawings (Volumes 6C and 6D) and Environmental Alignment Sheets (Volume 6E). The EPPs, Environmental Facility Drawings and the Environmental Alignment Sheets will be explained to the contractors and the roles of the contractor related to compliance will also be explained. Site tours will be arranged for contractors bidding on the Project. The tours will have representatives of the construction, engineering and environmental teams in attendance to discuss and view environmentally sensitive areas and areas where construction will be challenging. Potential contractors will have the opportunity to discuss and understand the mitigation measures the Project has committed to undertake.

5.2 Construction Kick-Off Meeting

The construction kick-off meeting will be held prior to construction and will include all construction management and supervisors, Lead Activity Inspectors, contractor supervisors, Environmental Inspector(s), resource specialists and Project management. The Environmental Compliance Plan, permit conditions, the EPPs, Environmental Facility Drawings (Volumes 6C and 6D) and Environmental Alignment Sheets (Volume 6E) will be discussed.

5.3 Development of the Environmental Compliance Plan

The Environmental Compliance Plan will be prepared prior to the start of any construction. The Environmental Compliance Plan will cover environmental compliance during pre-construction activities including clearing and during pipeline, facilities and Westridge Marine Terminal construction. The Environmental Compliance Plan will be finalized just prior to the start of construction when the Project teams have been determined, authorizations are in hand and EPPs have been updated.

The Environmental Compliance Plan will have an Executive Summary and a sign-off sheet to acknowledge that the document has been read and understood by the Construction Manager(s), contractor supervisors and the Trans Mountain Inspection team. The Environmental Compliance Plan will have an introduction including a Project description, map, schedule, purpose of the document, a commitment to the EHS Policy and will describe the permits and approvals in place for the Project. The plan will provide relevant details of the Environmental Management System and Environmental Manual, key aspects of the EPPs and other plans as needed. The next section will further refine the roles and responsibilities of key Project personnel and will discuss environmental compliance audit plans. The last section will describe the environmental commitment tracking table, issue list, specific notifications and reporting requirements, incident level identification matrices, shut-down procedures and incident reporting requirements. The appendices will include copies of key permits, the construction communication plan and will include copies of non-compliance incident forms, spill report forms and MOC forms.

5.4 Marking Environmental Features

The Environmental Inspection team will mark resource-specific environmental features on the construction right-of-way or facility footprint areas. Construction personnel will be trained to understand the various markings. Prior to construction in an area with marked features, the Environmental Inspector(s) will hold field meetings with construction personnel to discuss the specific concerns related to those marked features.

5.5 Pre-Construction Photographic Record

Pre-construction photographs will be taken of infrastructure or environmental sensitivities that will likely be impacted by construction where comparison of pre-construction and post-construction conditions will be beneficial.

6.0 ENVIRONMENTAL EDUCATION

Trans Mountain will develop and implement an environmental education program to ensure that all individuals involved in the construction of the Project understand the environmental requirements of the Project and their role and responsibilities with regard to meeting those requirements. The environmental education program, in association with safety training, will be provided to all construction personnel and visitors and will consist of a variety of levels of environmental awareness and training. Construction personnel for the Project will include non-supervisory and supervisory workers as well as the Construction Manager(s), Environmental Compliance Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and Environmental Inspector(s). Individuals will receive training commensurate with their roles and responsibilities. In addition to the standard, formal training provided in advance of construction, issue-specific or resource-specific training, or refresher training, will also be conducted, as warranted. Records of environmental training provided to workers and visitors will be maintained. The proposed training programs are described below.

6.1 All Construction Personnel and Visitors

All individuals, including visitors, have the potential to influence compliance with environmental commitments. To this end, Trans Mountain will devise a standardized means of imparting critical information regarding the environmental requirements of the Project to all workers and visitors. Upon completion of the basic level of training, the individual will be required to sign a form indicating that they have read and understood the training and will be issued a hard hat sticker signifying that they have completed the basic training. All signed worker and visitor forms will be kept on file at the construction field offices. No person will be permitted to be on a Project site without a valid hardhat sticker.

6.2 Supervisory Construction Personnel and Trans Mountain Inspectors

In addition to basic level training, supervisory construction personnel and Lead Activity Inspectors employed by Trans Mountain as well as contractor supervisors (*i.e.*, the decision-makers during construction of the pipeline) will be required to complete a more comprehensive environmental training session prior to working on the Project. This intermediate level of environmental training will be provided through a classroom session conducted by Trans Mountain's environment staff, Environmental Compliance Manager and/or Environmental Inspector(s). The curriculum for the intermediate level training will consist of a presentation and discussion of the following:

- the EHS Policy;
- Project-specific environmental issues and mitigation measures, and how to interpret the associated Environmental Facility Drawings (Volumes 6C and 6D) and Environmental Alignment Sheets (Volume 6E);
- contingency plans and management plans, including the traffic management plan;
- decision-making procedures regarding environmental matters; and
- the role and responsibilities of key Project personnel including the Environmental Compliance Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and Environmental Inspector(s).

6.3 Supervisory Construction Personnel, Construction Managers and Environmental Inspectors

The Environmental Manager, Environmental Compliance Manager, environment staff and/or environmental consultants will conduct an advanced level environmental training program for the Construction Manager(s), contractor supervisors, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and Environmental Inspector(s) for the Project in order to prepare them for the specialized capacity in which they will be working. The advanced level of environmental training will consist of a review of documents prepared for the Project, review of environmental permits, a classroom session and a field orientation. The advanced level environmental training curriculum will address the following:

- roles, responsibilities and authority of the key personnel (note that roles and responsibilities are found in Section 3.4.1 of Volume 6A as well as Section 1.0 of the Pipeline EPP, Facilities EPP and Westridge Marine Terminal EPP in Volumes 6B, 6C and 6D, respectively);
- KMC's environmental policies and environmental compliance initiatives, which have been adopted by Trans Mountain;
- specific environmental and socio-economic issues and mitigation measures;
- environmental issue resolution and the role of the Environmental Compliance Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and Environmental Inspector(s) as it relates to other supervisory/inspection personnel;
- contingency plans and the role of the Construction Manager(s), Environmental Compliance Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and Environmental Inspector(s) in the event of emergencies such as fires or spills;
- environmental commitments;
- commitment tracking procedures;
- issue tracking procedures;
- regulatory liaison and associated requirements;
- stakeholder and Aboriginal community relations;
- resource-specific and refresher training; and
- daily duties, reporting requirements and general procedural protocols.

The Construction Manager(s), Environmental Compliance Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and Environmental Inspector(s) will be provided with copies of the EPPs (Volumes 6B to 6D), the Environmental Alignment Sheets (Volume 6E), the Environmental Facility Drawings (Volumes 6C and 6D), the Environmental Compliance Plan, all permits and approvals for the Project and all other appropriate reference material (e.g., weed identification guide). An electronic copy of applicable environmental documents related to the application (including Volumes 5A and 5B as well as the technical reports in Volumes 5C and 5D), construction program and other reference material (e.g., Canadian Council of Ministers of the Environment documents for contaminated sites) will be maintained in the field office(s) for use by Environmental Inspector(s) and other construction inspection/supervisory personnel.

In addition, some specialized training for the Lead Activity Inspector(s) and Environmental Inspector(s) will be provided, as appropriate. This training will consist of information sessions provided by resource specialists (e.g., agrologists, botanists, wildlife biologists and archaeologists) to develop and improve skills (e.g., identifying rare plants or conducting an initial assessment of a suspected archaeological find during topsoil/root zone material salvaging or trenching). By completing the training, the Lead Activity Inspector(s) and Environmental Inspector(s) will be better equipped to implement contingency plans contained within the EPPs, such as the Heritage Resources Discovery Contingency Plan. The resource specialists will be on call to assist the Environmental Inspector(s) as required.

6.4 Site-Specific Training and Refresher Training

Resource-specific or issue-specific training, such as tailgate meetings, provide an opportunity for on-the-spot reinforcement of awareness of environmental stewardship, special measures pertaining to sensitive areas or activities with a high potential for adverse environmental effects. Site-specific training will be conducted by Environmental Inspector(s) and other inspection/supervisory personnel, as needed (e.g., prior to instream work at sensitive watercourses). The overall plan of action, including timing and responsibilities, will be discussed. Special emphasis will be placed on unusual issues or measures to be implemented. Contingency plans and the location of resources to deal with contingency events may also

be reviewed at that time, if appropriate. Informal training will also be conducted in the event that there are minor environmental non-compliances or other issues where individuals or crews would benefit from refresher training.

7.0 ENVIRONMENTAL INSPECTION DURING CONSTRUCTION

The involvement of full-time, qualified and trained Environmental Inspector(s) is a key component of Trans Mountain's environmental compliance strategy. The Environmental Compliance Manager, Supervisor of Environmental Inspection, Lead Activity Inspector(s) and the Environmental Inspector(s) will enforce continuous and consistent compliance with this application, all permit/approval conditions, environmental laws and guidelines, and other environmental commitments. The Environmental Manager will be available to the Environmental Inspector(s) for decision-making support and for resolution of environmental resource issues arising on-site.

All incidents that qualify as being non-compliant with applicable laws, commitments made by Trans Mountain and/or specific approval conditions by regulatory authorities, will be reported to the Environmental Compliance Manager. The Environmental Compliance Manager will take necessary steps to rectify the situation through appropriate steps to notification of regulatory authorities, implementation of suitable mitigation measures by the contractors and record keeping of the circumstances that resulted in the non-compliance, any remedial measures taken and any recommendations for future monitoring.

The Lead Activity Inspector(s) will report directly to the Construction Manager(s) and will be recognized as an integral part of the construction management team. The Lead Activity Inspector(s) and Environmental Inspector(s) will collaborate with the Construction Manager(s) and will have the authority to halt construction activities during specific non-compliance activities that have the potential to have adverse effects on the environment.

7.1 Environmental Inspection Program Description

Trans Mountain's contractors will implement the mitigation measures outlined in Sections 7.0 and 8.0 of Volumes 5A and 5B, in the Pipeline EPP (Volume 6B) and on the accompanying Environmental Alignment Sheets (Volume 6E), in the Facilities EPP and accompanying Environmental Facility Drawings (Volume 6C) and in the Westridge Marine Terminal EPP and accompanying Environmental Facility Drawing (Volume 6D).

The Environmental Inspector(s) will monitor construction and prepare daily reports of activities and conditions. The environmental issues and the implementation of mitigation measures will be monitored by the Environmental Inspector(s). If the mitigation measures are found to be not effective, the Lead Activity Inspector(s) or Environmental Inspector(s) will consult with the Construction Manager(s), Environmental Compliance Manager and/or Environmental Manager. The Environmental Inspector(s) will also be responsible for the following (in discussion with the contractors): monitoring compliance with environmental commitments; recommending additional or alternative mitigation measures; noting potentially adverse environmental effects; identifying site-specific issues; and determining the status of environmental issues following construction of the Project. The MOC process will be followed for changes to mitigation measures. Regulatory approval may be required for substantial changes.

7.2 Environmental Inspector Qualifications and Duties

The Project team will have Environmental Inspector(s) with experience in pipeline construction and/or environmental inspection. The Environmental Inspector(s) will have an understanding of pipeline construction techniques and will take a preventative approach, rather than a reactive approach, to environmental issues and will have a demonstrated positive attitude toward environmental protection and a track record of successful environmental issue resolution. In addition, Environmental Inspector(s) will be supported by appropriate resource specialists who will have expertise in a particular resource feature associated with the Project (e.g., fisheries biologist, botanist, wildlife biologist and reclamation specialist) and who will be available on-site or via consultation, when warranted.

The Lead Activity Inspector(s) and Environmental Inspector(s) are accountable for inspection and monitoring duties that ensure compliance with local, provincial and federal environmental legislation, permit/approval conditions and the Project EPPs. All Environmental Inspectors have the authority, in consultation with the Lead Activity Inspector, to halt construction activities during specific non-compliance activities that have the potential to have adverse effects on the environment. Lead Activity Inspector(s) and Environmental Inspector(s) may suspend activities if the contractor is in non-compliance with an

environmental component until the potential adverse environmental effect has been addressed (e.g., through additional work conditions or effective measures, equipment or materials). However, the Lead Activity Inspector(s) and Environmental Inspector(s) will establish a co-operative working relationship with the Construction Manager(s) and will provide support in the decision to suspend work in conjunction with the Construction Manager(s). Regular liaison with applicable regulatory authorities during construction will be the responsibility of the Lead Activity Inspector(s) and Environmental Compliance Manager.

The Lead Activity Inspector(s) will be responsible for ensuring that construction activities are conducted in a manner consistent with the Project EPPs, environmental commitments and applicable legislation during all activity phases of construction. The Lead Activity Inspector(s) and Environmental Inspector(s) will communicate environmental requirements to field construction management regarding how to comply with these commitments and legislation within the context of construction activities and environmental conditions.

The Lead Activity Inspector(s) and Environmental Inspector(s) will travel the construction right-of-way to monitor construction activities and record the implementation of mitigation measures. The Environmental Inspector(s) will also advise the Lead Activity Inspector(s) of the measures the contractor is required to implement to limit environmental disturbance. The Environmental Inspector(s) will keep ahead of construction activities to ensure that all resource-specific environmental features are clearly marked and construction inspection personnel are aware of upcoming issues (e.g., soil conditions, drainages, weeds, rare plant communities). In addition, the Environmental Inspector(s) will, where warranted, visit sensitive sites with applicable Lead Activity Inspector(s), contractor personnel and resource specialists to plan construction activities at these sites and to ensure that resource specialists are present, when warranted, to monitor activities during key construction events/environmental sensitive periods.

To document the environmental inspection process, the Lead Activity Inspector(s) will generate a daily report that provides a synopsis of the day's activities, including a photographic record. The daily reports will record where environmental mitigation measures were successful, in addition to recommendations and actions taken on major decisions, such as wet conditions shut-down, procedures implemented in the case of unforeseen environmental issues or discoveries, non-compliance and conflicting permit/approval requirements. Unresolved issues or items identified for future follow-up will be documented/recorded. The daily reports allow pertinent environmental information from the field to be provided to the corporate level to allow for prompt responses by Trans Mountain when warranted (e.g., non-compliance issues). At the completion of the Project, the Lead Activity Inspector(s) and Environmental Inspector(s) will be responsible to assist in the completion of an Environmental As-Built Report, as defined in Section 7.3.1.

7.3 Communication and Reporting

The Lead Activity Inspector(s) will report directly to the Construction Manager(s) in matters relating to environmental construction and reclamation requirements. Environmental issues and non-compliances, the reasons for the non-compliance and the measures conducted for the resolution of each issue and non-compliance will be recorded and tracked in non-compliance and daily reports. Serious non-compliances will be immediately reported to the Environmental Compliance Manager and the Environmental Manager and to the EHS personnel to notify the appropriate regulatory authority, if warranted. In the event that issues remain unresolved following the implementation of remedial measures, the issue and location(s) in question and the measures proposed to resolve the issue will be recorded in an Environmental As-Built Report.

7.3.1 Environmental As-Built Report

Following completion of construction, Lead Activity Inspector(s), Environmental Inspector(s) and the Environmental Compliance Manager will assist in the preparation of an Environmental As-Built Report for the Project, making use of daily reports, the Environmental Issues List, photos and records of government liaison. The Environmental As-Built Report (including Environmental As-Built Alignment Sheets) will be submitted to the Environmental Manager, who will subsequently submit the report to the NEB as part of the PCEM Program, unless otherwise directed by the NEB.

The Environmental As-Built Report for the Project will contain the following components:

- a Project description, including what portion of the work was conducted, the construction kick-off and completion dates, the names of the Lead Activity Inspectors and other key construction supervisory personnel with whom the Environmental Inspector(s) had regular dealings;
- the general procedures, equipment used and mitigation measures implemented for each activity for which environmental inspection was required;
- the procedures that were implemented for unforeseen environmental issues that arose as well as a discussion of the decision-making process involved in arriving at those procedures;
- a detailed record of any discussions and decisions made regarding conflicting permit requirements or requests from regulatory authorities;
- a detailed record of any instances where recommendations could not be implemented and the circumstances and location of the event, as well as the decision-making rationale and selected alternate mitigation measures;
- a discussion of specific mitigation techniques and any field adaptations, which were used to make the mitigation more effective;
- a discussion of any changes to mitigation measures that required regulatory approval;
- a record of Aboriginal, landowner, regulatory authority and stakeholder liaison;
- a photographic record of relevant construction phases (e.g., pre-construction and post-construction vegetation cover);
- selected Environmental As-Built Alignment Sheets with handwritten notes, such as areas where extra temporary workspace (TWS) was taken, sites where a spot spill occurred, areas where erosion control measures were installed, the location of heritage resources, wildlife or rare plant species that were discovered during construction;
- a list of environmental issues and their respective status (*i.e.*, resolved and unresolved); and
- in the case of unresolved issues, a description and the location of the issues, an estimated timelines and steps that Trans Mountain proposes to take to resolve those issues.

Any pertinent paperwork, such as memos and permit revisions, will appear as an appendix to the Environmental As-Built Report.

8.0 ISSUE MONITORING DURING CONSTRUCTION

Trans Mountain will strive to carry out each component of the Project in an environmentally responsible manner through the assessment of environmental issues, the planning and implementation of mitigation measures as well as contingency plans to address those issues, and the establishment of compliance initiatives, such as environmental education and environmental inspection.

8.1 Environmental Commitment and Permit Tracking

As noted above, an Environmental Commitment Tracking Table will be created during the pre-construction phase and will be continuously updated with information relating to applicable legislation, permit and approval conditions, and environmental commitments established within the application, during subsequent filings and through permits received.

The EPPs and the Environmental Alignment Sheets (Volume 6E)/Environmental Facility Drawings (Volumes 6C and 6D) will be updated with the results of any supplemental studies conducted after filing the application, should any results warrant new resource-specific mitigation measures. The updated EPPs and Environmental Alignment Sheets/Environmental Facility Drawings will be filed with the NEB 2 months prior to the start of construction or as per certificate conditions.

If the requirements of permits or the direction given by regulatory authorities are found to be conflicting, an attempt will be made to resolve the discrepancy or disagreement with available representatives of affected regulatory authorities. The Lead Activity Inspector(s), Environmental Inspector(s) and/or the Environmental Compliance Manager will participate in the discussions and record the outcome in the Environmental As-Built Report.

8.2 Environmental Issues Tracking

Environmental issues identified during construction, along with a description of mitigation measures and their outcomes, will be tracked in the Environmental Issues List. Issues will be summarized in the Environmental As-Built Report along with their current status (*i.e.*, resolved during construction or ongoing).

Substantial changes to the mitigation measures, as they appear in the application, the EPPs, on the Environmental Alignment Sheets/Environmental Facility Drawings or on regulatory permits, will not be made without the approval of the NEB and appropriate regulatory authorities having jurisdiction.

8.3 Environmental Emergency Response

In the event that an unforeseen environmental emergency (*e.g.*, large spill or fire) arises during construction for which no mitigation measures have been approved or a contingency plan developed, Trans Mountain's emergency response plans will be followed. More information on emergency response is provided in Volumes 4A and 4C.

9.0 POST-CONSTRUCTION ENVIRONMENTAL MONITORING

Trans Mountain will conduct the PCEM Program during a period up to the first five complete growing seasons (or during years one, three and five) following commissioning of the Project or as per certificate conditions. The PCEM Program will be initiated following clean-up, in order to identify any unresolved issues upon the completion of construction. The first PCEM report will be the Environmental As-built Report.

The purpose of the PCEM Program is as follows.

- Evaluate the success of reclamation and effectiveness of mitigation measures used in areas disturbed during construction.
- Identify environmental issues that may have arisen post-construction on the Environmental Issues List.
- Recommend and coordinate the implementation of any remedial measures that are warranted to address any outstanding or new environmental issues.

9.1 Initial Post-Construction Report

Preliminary work will entail a desktop review of relevant planning, construction and environmental reports to create an Environmental Issues List, which will be provided in the Environmental As-Built Report. Although efforts will be made to resolve issues as they arise (e.g., relieving right-of-way compaction prior to final clean-up), the Environmental Issues List will be used to track any outstanding unresolved issues. The Environmental Issues List will form the basis for reclamation activities during the remainder of the PCEM Program and will be updated on an ongoing basis. Unresolved issues included in the Environmental Issues List may include items such as trench subsidence, compaction, soil erosion, vegetation establishment, admixing of topsoil/root zone material with subsoil and wood debris, contamination issues and others.

After a desktop review has been completed, an aerial or ground reconnaissance will be initiated to note any areas where soil erosion, slope/bank instability, disruption of natural drainage or excessive trench subsidence is evident. As well, agricultural productivity will be evaluated in this desktop, aerial or ground reconnaissance. The reconnaissance includes the monitoring of specific watercourse crossings. Areas of potential terrain instability will be monitored during spring break-up after construction and for at least 2 years following construction. Once the initial reconnaissance has been completed, on-site investigations will then be completed to inspect any locations where potential problems were noted. The Environmental Issues List will be updated with this information along with issues that are raised by Aboriginal communities, landowners and leaseholders, regulatory authorities or operations personnel.

Ground reconnaissance of topography, soils, vegetation (including windthrow in Old Growth Management Areas [OGMAs]), riparian areas, instream habitat, wetlands or human access parameters at selected locations along the construction right-of-way will be conducted by resource specialists. Additional discipline-specific personnel, such as wetlands specialists to assess wetland function, reclamation, agrologists with experience in evaluating crop production and soil issues and rare plant specialists to assess the status of rare plant populations will be assigned to the PCEM Program, where warranted, to assess issues that may arise. The appropriate specialists will make recommendations for any remedial measures.

9.2 Construction Right-of-Way Inspection

During ground reconnaissance, the resource specialists will inspect the conditions of the construction right-of-way and reclaimed working areas to assess the effects of pipeline construction and the effectiveness of the mitigation measures.

Determining the effectiveness of the mitigation measures applied to reduce the environmental effects of the Project will be based on the principle that success of reclamation is measured against adjacent representative site conditions while taking into consideration pre-construction conditions and the status of

reclamation at the time of the assessment. Reclamation monitoring involves an assessment of the final clean-up along the construction right-of-way, which includes grade reclamation and trench subsidence, slope stability, drainage re-establishment, topsoil/root zone material replacement, excess debris removal, revegetation (urban and rural areas), forested area planting success, establishment of a successional trajectory and line-of-sight measures establishment. Revegetation monitoring involves an assessment of the success of revegetation and the identification of any new weed infestations along the construction right-of-way. Soil erosion monitoring involves an assessment of the effects of wind and water on the construction right-of-way. This type of monitoring will include an assessment of effectiveness of any erosion control measures implemented during or after construction.

Streambeds, banks, riparian areas and approach slopes at watercourse and wetland crossings will be assessed for stability, erosion, vegetation establishment and presence of invasive species, as appropriate. The construction right-of-way will also be monitored to determine if there is any disturbance to natural surface drainage patterns.

Soil and/or vegetation sampling and testing of soil parameters will be conducted, if warranted, at locations where poor revegetation is evident in order to determine the cause (e.g., admixing of topsoil/root zone material, weeds, and/or compaction of soils) and magnitude of the problem, and to assist in the identification of appropriate remedial measures. Additional monitoring may be conducted prior to the implementation of remedial measures, depending on the extent and severity of the problem. More information regarding the monitoring of soils, vegetation, wetlands, watercourses, wildlife, noise, air and well-water quality is provided in the following subsections.

9.3 Criteria for Success

The criteria used to determine the effectiveness of the proposed mitigation measures will consist of an assessment of the topographic condition, soils, vegetation, riparian areas, instream habitat, air, noise, wetlands, wildlife habitat, human access and water wells (if warranted) along the construction right-of-way, temporary access areas and other areas disturbed during construction.

In general, in agricultural areas, right-of-way conditions will be compared to adjacent off right-of-way conditions. In forested, urban and industrial areas where the adjacent off right-of-way conditions may not resemble the post-construction right-of-way conditions (due to land use or management differences), a representative area close to the right-of-way will be selected or pre-construction conditions will be used for comparison.

Topography, line-of-sight, hydrology and microsite conditions will be assessed to ensure that the surface drainage, profile, stability and other features of the reclaimed construction right-of-way are consistent with the pre-construction conditions and the surrounding landscape.

Where soil production seems impaired, surface soils on and off the right-of-way and in working areas will be assessed for compaction, admixing, topsoil/root zone material depth, erosion, stoniness and soil structure. The success of soil mitigation measures will be based primarily on whether soil productivity is equivalent to off right-of-way conditions, measured as a function of crop yield for agricultural lands and vegetation vigour for non-agricultural areas. Physical crop/vegetation characteristics, such as colour, density and height, as well as vegetation species composition, will be assessed for deficiencies when compared to off right-of-way conditions. If these soil parameters and the crop yield/vegetation vigour on right-of-way are comparable to off right-of-way, then the proposed mitigation measures will be considered successful in relation to the soils component.

Vegetation on the reclaimed construction right-of-way (both natural and agricultural crops) will be visually compared to similar vegetation communities on undisturbed land adjacent to, or within, the vicinity of the construction right-of-way or from pre-construction field survey data. Bare soil, species type and densities, early successional species composition, shrub and tree establishment (forested TWS areas and woody riparian plant communities) and weed densities will be considered during the vegetation assessment. Where vegetation shows signs of reduced yield (cultivated), vigour and establishment success, surface soils will be assessed to ensure compaction, admixing, topsoil/root zone material depth, erosion, stoniness and soil structure are comparable to adjacent areas of the construction right-of-way.

Monitoring of OGMAs will continue each year until no major problems associated with the edges created are observed or in consultation with regulatory authorities (maximum 5 years of post-construction monitoring, depending on the level of windthrow incidence observed during annual surveying). Generally, areas with more than 15% windthrow would be considered to be experiencing levels in excess of natural windthrow and may require remedial activity.

Post-construction monitoring and reporting of the success and effectiveness of reclamation measures for instream, bank, riparian and approach slope habitat at fish-bearing watercourses will be determined through comparison of post-construction conditions to documented pre-construction conditions. Monitoring at these sites will include an evaluation of the terrain stability, soil productivity and erosion control on the banks and approach slopes (in relation to contour re-establishment and the erosion and sediment control measures that were implemented), and the success of riparian vegetation re-establishment. The evaluation of the success of riparian vegetation re-establishment will be determined by monitoring riparian vegetation (installed and naturally regenerating plants) as compared to a similar reference plant community located adjacent to, or within, the vicinity of the construction right-of-way and pre-construction conditions. Resource specialists will determine if the riparian plant community has initiated an early successional trajectory that will in time resemble the reference plant community, while recognizing the requirements of operational vegetation management (clearing of tree vegetation over the trench area for access and monitoring). In addition, the evaluation of success of riparian vegetation re-establishment will involve an assessment of weed issues and performance of the grass seed mix (establishment of a vegetation cover and limiting competition to establishing woody plants where applicable) used at watercourse crossings.

The post-construction condition of disturbed portions of wetlands will be compared to pre-construction baseline data and the condition of any wetlands located adjacent to the construction right-of-way. Criteria assessed will be a comparison of grade, substrate composition, surface water presence/absence, water quality and hydrophytic vegetation re-establishment to those observed during the baseline assessment and those evident off of the construction right-of-way. The results of this comparison will be used to measure the effectiveness of mitigation measures and to determine if there is indication of impeded wetland function.

Changes in upland, riparian, instream and wetland habitats, as well as site-specific habitat features, will be evaluated by comparing pre-construction conditions and adjacent habitats to the post-construction conditions. The results of post-construction monitoring for vegetation, aquatics and wetlands will be utilized in the determination of changes to wildlife habitat, in addition to wildlife and wildlife habitat monitoring results. Changes in wildlife presence and indication of habitat use will also be evaluated to determine whether mitigation measures are successful and to develop remedial measures to address residual effects, where warranted.

Along segments of the construction right-of-way where mitigation measures are implemented to control human access (in particular, motorized access), the effectiveness of access control will be determined by visually assessing evidence of human access (e.g., disturbance to vegetation establishment and cover, soil erosion and disturbance of access control measures). The results will be used to identify areas that require additional measures to prevent access along the right-of-way. Human access parameters will be noted by members of all post-construction monitoring teams (e.g., wildlife, vegetation, wetlands, and soils) and will be compiled into one set of information.

The noise monitoring program will be conducted to demonstrate compliance with noise legislation and to validate the modelling conducted. If mitigation is required, specific sources will be measured for the purpose of mitigation design, and follow-up monitoring will be conducted once mitigation is installed.

The ambient monitoring program will be conducted to demonstrate compliance with ambient air quality objectives and guidelines, and to confirm any modelling where elevated levels were predicted to occur. If mitigation is required, specific sources may be measured for emission levels to assist with engineering design estimates and ambient monitoring may be appropriate to confirm the success of the mitigation measures, once installed.

Where requested by a landowner, well-water quantity and quality parameters (e.g., flow rates and water quality concentration levels) will be compared to pre-construction measured levels in order to determine if measurable adverse effects have occurred related to activities conducted for the Project.

9.4 Leaseholder/Landowner/Regulatory Authority Consultation

Trans Mountain will continue to consult with regulatory authorities on the protocols for post-construction monitoring of reclamation success for terrain and soils, vegetation, wetlands, watercourses, wildlife habitat, noise and air, and will incorporate their recommendations as warranted. Consultation to date has emphasized the importance of a thorough PCEM Program for several elements and no major issues with the proposed PCEM Program methodology have been raised.

Trans Mountain will initiate a post-construction dialogue with landowners and leaseholders along the pipeline right-of-way after final clean-up to address and/or resolve any relevant issues. Construction-related issues that are raised during ongoing operation will be addressed by Trans Mountain. Trans Mountain will maintain a database to track landowner and leaseholder consultation information.

9.5 Physical Environment, Terrain and Soils Assessment

A review of the Environmental Issues List will identify areas in which soil sampling or additional assessment may be warranted to address reclamation concerns. Soil assessment, sampling and *in situ* soil testing can provide additional information to assess reclamation success related to the mixing of topsoil/root zone material and subsoil, topsoil/root zone material depth, erosion, compaction, subsidence, rutting, contamination issues, stoniness, contour reclamation and soil structure.

The frequency and location of assessment and sample locations along the construction right-of-way will be determined by the resource specialist. Criteria for determining sampling locations and frequency will include, but not be limited to, the following:

- visual indications of potential issues including growth of vegetation and agricultural crops;
- landscape variation;
- changes in construction procedures;
- changes in soil moisture; and
- changes in compaction by depth and laterally as measured *in-situ*, and through soil sampling.

Soil sampling frequency and location will be based on areas with evidence of reduced soil productivity. If potentially contaminated soil is observed during the PCEM Program, the location will be recorded and recommendations will be made for soil (and potentially groundwater) from the area to be sampled and analyzed to determine if further investigation is required and if so, it will provide recommendations on how to proceed.

9.6 Vegetation Monitoring

Vegetation monitoring consists of a visual inspection by a resource specialist. The timing of vegetation monitoring will generally be in the mid to late summer when the vegetation is mature enough for accurate identification and evaluation. Particular attention will be given to areas of terrain instability that may be prone to erosion. If warranted, detailed vegetation assessments will be completed at sites where reclamation problems are identified in the Environmental Issues List. Where warranted, rare plant, rare lichen and/or rare ecological community monitoring will be conducted by a rare plant specialist in the early and/or late-summer (depending on the species to be monitored) one full growing season after clean-up has been completed. For areas that contained native vegetation prior to construction, reclamation will focus on the establishment of an early successional trajectory of a native vegetation community. Monitoring of vegetation species composition, cover/density and vigour, compared to off right-of-way reference sites, will be performed to determine if reclamation is successful.

For cultivated lands, landowners and farm operators will be engaged to solicit information on crop production. Vegetation on the construction right-of-way and in reclaimed working areas will be visually assessed for crop growth. For hay and tame pasture lands, ground cover of desirable species will be assessed by estimating the total percent of live cover. The occurrence and type of undesirable species (*i.e.*, weeds) will be assessed by estimating the percent cover using the same method. The construction right-of-way will be inspected for issues such as poor vegetation establishment or reduced crop growth. Each area identified as having a crop production issue will be compared to adjacent land conditions. In forested areas, vegetation on the construction right-of-way will be visually assessed for cover establishment. In urban areas, vegetation will be monitored for the timely establishment of cover that will reduce erosion and sedimentation.

Vegetation parameters to be assessed include the following:

- loss or alteration of rare plants, lichens and rare ecological communities;
- revegetation and disturbances to vegetation within agricultural, forested and urban areas;
- native grass/forb re-establishment and the establishment of an early successional trajectory of native grasslands;
- acceleration of the spread of forest health pathogens;
- annual crop density, height, phenological stage, vigour, distribution and colour on cultivated lands;
- bare soil exposure, visible erosion, surface vegetation and litter, grazing pressure and plant vigour on hay, tame pasture, native pasture, native grasslands and treed pasture lands;
- cover establishment on forested lands;
- cover establishment in urban areas;
- spread of the clubroot pathogen within agricultural lands; and
- weed issues.

For some treed areas (*e.g.*, riparian areas) where the natural regeneration of woody vegetation along the construction right-of-way is the preferred option for revegetation, the establishment of a vegetative cover compatible with the surrounding vegetation and land use will be evaluated. Compatibility will be determined as it relates to the desired end use. Parameters used to assess compatibility include the following.

- Preferred species, representative of the natural subregion, are present growing on the reclaimed area, demonstrating that the existing or proposed end land use can be sustained.
- Noxious/Prohibited Noxious weeds are not present.
- Non-native, invasive species (*e.g.*, clovers and creeping red fescue) which were not previously present have not invaded the area.
- Aggressive native grass species that will outcompete naturally regenerating woody species are not present.
- Native species diversity has been maximized, as evidenced by the presence of a variety of plant forms and species, and/or the potential exists for the recolonization of the disturbed area by native species in adjacent areas.

Compatibility of vegetation will be assessed during the PCEM Program by individuals trained in identifying native, non-native, agronomic and rare plant species.

9.6.1 Old Growth Management Areas

A monitoring plan for windthrow will be implemented to document changes to newly created edges in OGMA's and to identify where further mitigation measures are required should windthrow levels exceed natural levels in consultation with regulatory authorities. The monitoring plan will commence within a year, or less, of construction right-of-way clearing, and will be completed by a Registered Professional Forester. Surveying of edges (as part of construction and clearing plan development) will highlight areas rated with moderate to high windthrow potential. These areas will be determined prior to construction and amended as construction and clearing is completed. This will ensure that sampling of edges includes habitats that are more likely to exhibit strong responses to the creation of edges. These areas generally include wet depressions or wet areas with shallow rooting, edges with high mortality (*i.e.*, mountain pine beetle attacked areas), and/or areas where historic blowdown was present within the stand prior to clearing.

Windthrow surveying will be completed by helicopter or on the ground. Monitoring will continue each year until no major problems associated with the edges created are observed (maximum 5 years of post-construction monitoring, depending on the level of windthrow incidence observed during annual surveying) or as per NEB certificate conditions. Generally, areas with more than 15% windthrow are experiencing levels in excess of natural windthrow and may require restoration.

OGMA's will be monitored during the vegetation monitoring program for invasive species where they are crossed by the proposed pipeline corridor.

9.7 Wetland Monitoring

The objectives of the wetlands monitoring component of the PCEM Program are to gather sufficient information to identify the status of the recovery of wetland function and to measure the effectiveness of Trans Mountain's wetland construction and reclamation mitigation.

The wetland-specific PCEM Program entails revisiting all disturbed wetlands following construction to document the progress of function (*i.e.*, habitat, hydrological and biogeochemical) returning to the wetland ecosystem. Ground-based surveys will be conducted at all wetlands disturbed by construction. Photographs will be taken and locations will be georeferenced at each wetland. All wetlands will be surveyed to document wetland recovery during the wetland monitoring component of the PCEM Program.

Wetland functional conditions documented during existing conditions (*i.e.*, pre-construction) and wetland functional conditions that were observed either adjacent to, or in close proximity to, the construction right-of-way will be directly compared to wetland functional conditions observed along the reclaimed (*i.e.*, post-construction) construction right-of-way. By employing the same wetland functional assessment criteria as was used during the existing study, a quantitative measurement of overall wetland function for each wetland encountered by the construction right-of-way can be determined so that existing (baseline) conditions can be compared to post-construction conditions over time. The results of this comparison will be used to measure the effectiveness and efficiency of mitigation measures and to provide support to the determination of "loss" or "no net loss" of wetland function (Environment Canada 1991, 1996). In the early stages, the monitoring will typically demonstrate whether a wetland is on the trajectory towards achieving the goal of "no net loss" of wetland function within the post-construction monitoring timeframe or whether immediate action is required to remediate the wetland to achieve this goal. The results of the PCEM Program will be compiled in a Wetlands PCEM Report as an appendix to the general PCEM Program.

A qualified wetland specialist will conduct wetland monitoring. Wetland specialists view wetlands as dynamic landscape systems (*i.e.*, all variables are interrelated) and complete functional assessments using best professional judgement.

Specifically, the PCEM Program will document:

- post-construction wetland function (*e.g.*, hydrology and seedbank reclamation);
- the degree of establishment success of site-specific woody riparian fringe reclamation efforts; and

- any land use changes by landowners or developers that prohibit the return of wetland function (*i.e.*, cultivating wetlands or wetland margins and infrastructure, such as road development affecting wetland function).

Based on the findings during the PCEM Program, recommendations for remedial measures will be provided, if warranted, to promote the successful return of wetland function to the baseline conditions as quickly as practical and within the duration of the PCEM Program. Wetland function post-construction monitoring will be conducted during the first full growing season after clean-up and again during the second growing season, if needed, or as per NEB certificate conditions. If a wetland is not determined as having the same functional conditions as documented during the baseline assessment, Trans Mountain will continue to monitor those specific wetlands in years three and five after construction.

Compensation is not currently being considered for the wetlands crossed by the Project since pipeline construction through wetlands is considered a temporary disturbance. However, if at the end of the last year of monitoring (*i.e.*, year five after construction), it is determined that wetland reclamation has not been effectively achieved and there appears to be some loss of wetland function, then compensation would be considered. Compensation would only be considered where additional mitigation to reclaim wetland function was determined not to be an appropriate course of action and following consultation with Environment Canada and other regulatory authorities regarding the appropriate next steps.

9.8 Watercourse Monitoring

Watercourse monitoring, as part of the PCEM Program, will be carried out by a specialist with experience completing post-construction monitoring. The objective of the watercourse monitoring is to gather sufficient information to document the status of the watercourse reclamation and the function of the reclaimed habitat.

Specifically, the PCEM Program will document:

- alterations of natural flow patterns;
- reduction of surface water quality;
- increased water column suspended sediment concentrations;
- channel morphology, in particular, the stability of banks and approach slopes, evidence of erosion and the effectiveness of post-construction erosion control measures;
- the continued function of any instream habitat enhancement carried out and the absence of any barriers to the movement of fishes at fish-bearing watercourses;
- the revegetation of riparian areas and the presence of invasive species; and
- sites used for withdrawal of hydrostatic test water.

Monitoring at fish-bearing watercourses will confirm that instream habitat that was reclaimed remains functional. Fish-bearing watercourses where an authorization by Fisheries and Oceans Canada (DFO) was necessary, may be subject to specific monitoring conditions and/or timing requirements for monitoring. DFO prescribed monitoring will be carried out in conjunction with the PCEM Program and will ensure that both programs are satisfied.

Based on the findings at any stage of the PCEM Program, recommendations for remedial measures will be provided, if warranted, at any watercourse, to ensure that the overall objective or reclaiming the watercourse to pre-construction conditions can be achieved. Fish-bearing watercourses crossed will be revisited during years one to five following construction or as per NEB certificate conditions. PCEM reporting will take place in years one, three and five.

9.9 Wildlife and Wildlife Habitat Monitoring

The objective of the wildlife and wildlife habitat monitoring component of the PCEM Program is to collect sufficient information to determine the effectiveness of mitigation, identify need for adaptive measures, and detect changes in wildlife and wildlife habitat resulting from the Project. The wildlife and wildlife habitat monitoring will use baseline data, collected prior to construction, as a basis for comparison of construction and post-construction monitoring data. Post-construction monitoring will be conducted at intervals over a five-year period (e.g., years one, three and five following completion of reclamation). Monitoring will be completed by qualified biologists.

The wildlife and wildlife habitat PCEM will include the following information:

- a review of mitigation measures implemented and issues identified by the Environmental Inspector(s) during construction and recommendations to address any unresolved issues; and
- details on post-construction monitoring protocols specific to wildlife and wildlife habitat. Locations selected for post-construction monitoring will be based in part on consultation with regulatory authorities and the results of the pre-construction field surveys. Likely locations for monitoring include high value wildlife habitats (e.g., select wetlands, sensitive areas, locations where there is high potential for species at risk). Appropriately timed wildlife surveys, similar to those conducted during pre-construction surveys, will be conducted at these locations.

Wildlife monitoring will be designed to detect changes in wildlife habitat, wildlife presence and, where feasible, relative abundance compared to pre-construction conditions. An adaptive management component will be included in the wildlife post-construction monitoring program, whereby results of the wildlife monitoring will be used to determine the need for further monitoring and the need for and nature of remedial measures to address identified issues. For example, remedial measures may include additional seedling planting at locations that are not demonstrating adequate natural regeneration to alleviate effects on sensitive species in a timely manner and/or installing additional access control and/or signage to discourage human access if there is evidence of new access on site-specific segments of the right-of-way. The appropriate remedial measures suited to the location, conditions and issue that requires action will be developed by qualified biologists in consultation with Trans Mountain representatives and regulatory authorities (e.g., Environment Canada, BC Ministry of Forests, Lands and Natural Resource Operations, BC Ministry of the Environment, Alberta Environment and Sustainable Resource Development), where warranted.

9.10 Noise Monitoring

The objective of the noise PCEM Program is to evaluate operational noise levels at select stations and terminals where predicted noise levels are approaching provincial regulatory guidelines. The noise monitoring will be conducted by a noise specialist within 1 year of the commencement of operation of the Project or as per NEB certificate conditions. Noise monitoring will be designed to demonstrate compliance with provincial regulatory guidelines.

Specifically, the PCEM Program will document the following items:

- noise during operations at each site where predicted noise levels are approaching thresholds (based on the Alberta Energy Regulator *Directive 038 Noise Control* [Alberta Energy Resources Conservation Board 2007], *British Columbia Noise Control Best Practices Guideline* [BC Oil and Gas Commission 2009] and the results of the Terrestrial Noise and Vibration Technical Report [Volume 5C]). Specifically, noise monitoring programs will be implemented at Burnaby Terminal, Westridge Marine Terminal and Sumas Terminal. At the Westridge Marine Terminal, the noise monitoring program will be implemented at a time when tankers will be involved in operations; and
- additional mitigation, if necessary.

9.11 Air Monitoring

The objective of the air emissions PCEM Program is to evaluate operational ambient air quality levels at select tank terminals where predicted air concentration levels resulting from the Project are approaching federal, provincial and/or municipal regulatory guidelines or objectives. The ambient monitoring will be conducted by qualified field technologists within 1 year of the commencement of operation of the Project, or as per NEB certificate conditions. Ambient monitoring will be designed to demonstrate compliance with federal, provincial and municipal regulatory guidelines.

Specifically, the PCEM Program will document the following items:

- depending on the dispersion modelling, ambient concentrations of appropriate chemicals, such as criteria air contaminants, volatile organic compounds, particulate matter, hydrogen sulphide, mercaptans and other chemicals of interest, would be monitored during operations at each facility where predicted air concentrations resulting from the Project are approaching regulatory thresholds (based on Environment Canada, Alberta, BC and municipal ambient air quality objectives); and
- additional mitigation measures to limit emissions at source, if necessary.

9.12 Water Well Monitoring

Post-construction monitoring of well water quality will take place if requested by landowners. Specifically, the water well testing program will document water quality after construction, to assess if a measurable adverse effect has occurred that can be related to activities associated with the Project. Water quality and quantity will be measured, including flow rates, total and dissolved metals, iron related bacteria, sulphur related bacteria, heterotrophic plate count, total coliforms, E.Coli and other routine water quality parameters.

All water quality parameters collected will be compared to pre-construction monitoring results and the *Guidelines for Canadian Drinking Water Quality* (Health Canada 2012). The post-construction monitoring program will determine if well samples exceed any maximum acceptable concentration levels (e.g., total coliform, e-coli bacteria, fluoride, or nitrate) and if water quality and quantity are comparable to pre-construction parameters.

9.13 Selection of Remedial Measures

In the event that the PCEM Program identifies a location where the construction reclamation measures were unsuccessful in avoiding or reducing effects (e.g., weed introduction, poor revegetation, excessive trench crown height in wetlands), the site will continue to be assessed during the course of the PCEM Program. The remedial measure(s) chosen will be influenced by the severity of the issue, areal extent and location, and likely causes that may have resulted or contributed to the ineffective construction reclamation measures. Based on the above evaluation, a determination will be made whether to continue monitoring (e.g., at locations where poor revegetation is evident but drought conditions have occurred) or to implement remedial measures (e.g., repair excessive trench crown subsidence and re-establish wetland contour to pre-construction conditions). Where appropriate, mitigation or contingency measures found in the EPPs will be used to remediate a site. In the low likelihood event that issues are identified that are not addressed in the EPPs or existing available regulatory guidelines/standards, then remedial measures will be specific to the location and will be discussed with stakeholders and Aboriginal communities, depending on impact.

Where issues are identified through this assessment, every effort will be made to implement mitigation measures as soon as feasible, however, there may be some circumstances where mitigation must be delayed (e.g., subsoil compaction may be identified at a time when the soils may be too wet for effective subsoil compaction remediation to be implemented immediately). Issues that cannot be mitigated immediately will be documented in the Environmental Issues List for mitigation as soon as conditions allow and monitoring will typically be planned during the following year of the PCEM Program.

9.14 Operations and Maintenance Activities

Monitoring during operations and maintenance activities will be composed of regular aerial patrols with ground reconnaissance to assess any issues raised during the aerial patrols, issues raised by Aboriginal communities, landowners and leaseholders or regulatory authorities or potential issues arising from heavy run-off or precipitation events. Operational and environment personnel will ensure that any mitigation measures that are warranted are implemented in a timely basis. In-line investigative tools will be run at regular intervals in order to monitor the pipeline. Investigative and/or integrity digs will be conducted as warranted. Monitoring will be conducted at facilities pursuant to permitting conditions (e.g., storm water monitoring will be conducted at the Westridge Marine Terminal). Upon the completion of the PCEM Program, monitoring by Trans Mountain personnel will occur regularly throughout the life of the pipeline.

9.15 Documentation and Reporting

The PCEM Program results will be submitted to the NEB at the end of each year of monitoring. The PCEM Report will be prepared as per Guide AA.2 (post construction environmental monitoring reports) of the NEB *Filing Manual* (2013). Wetlands and wildlife results will be submitted as detailed appendices to the overall PCEM report. The first-year PCEM report will also include the Environmental As-Built Report. PCEM reporting will include:

- a discussion of the effectiveness of mitigation and reclamation;
- the development and implementation of alternative measures to accomplish the reclamation where the initial measures were not successful; and
- the identification and documentation of all outstanding environmental issues along with, where warranted, the plans and a schedule for resolution.

The PCEM Program will document post-construction environmental issues identified for the Project. Issues that have been successfully mitigated will be listed as resolved. The program will also identify any locations with unresolved environmental issues and the remedial measures planned by Trans Mountain to resolve these issues.

9.16 TMX - Anchor Loop Project Post-Construction Environmental Monitoring

The TMX - Anchor Loop Project required construction through Jasper National Park in Alberta and Mount Robson Provincial Park in BC, both of which are part of the United Nations Environmental, Scientific and Cultural Organization Canadian Rocky Mountain Parks World Heritage Site. In recognition of this setting and through consultation with stakeholders and various government agencies, Trans Mountain implemented a number of unique and innovative restoration measures at particularly sensitive areas, with the objective of restoring ecological integrity of these lands and watercourses. Following construction of the TMX - Anchor Loop Project, Trans Mountain reported on the effectiveness of mitigation and restoration that was implemented during and following construction as outlined in the EPP and Restoration Plan for the Project. Many of the successes identified during post construction monitoring can be attributed to the implementation of those mitigation measures outlined in the plans. The mitigation measures were successful at achieving the desired end results and management objectives of Parks Canada (TERA 2013). The TMX - Anchor Loop Project is viewed by many as a legacy project, and has achieved a level of success that has exceeded expectations in many areas. This project proved that an oil pipeline can be constructed, maintained and operated in a highly valued ecological and historical setting of international importance. Many of the approaches, plans and programs which were implemented on TMX- Anchor Loop Project have been adapted and enhanced for the TMEP.

10.0 REFERENCES

- Alberta Energy Resources Conservation Board. 2007. Directive 038 Noise Control. Website: <http://www.aer.ca/documents/directives/Directive038.pdf>. Accessed: August 2013. British Columbia Oil and Gas Commission. 2009. British Columbia Noise Control Best Practices Guideline, March 17, 2009. Victoria, BC.
- British Columbia Oil and Gas Commission. 2009. British Columbia Noise Control Best Practices Guideline, March 17, 2009. Victoria, BC.
- Canadian Standards Association. 2000. Z769-00 Phase II - Environmental Site Assessment (Reaffirmed 2008). Mississauga, ON. 47 pp.
- Environment Canada. 1991. The Federal Policy on Wetland Conservation. The Canadian Wildlife Service, Environment Canada. Ottawa, ON.
- Environment Canada. 1996. The Federal Policy on Wetland Conservation. Implementation Guide for Federal Land Managers. The Canadian Wildlife Service, Environment Canada. Ottawa, ON.
- Health Canada. 2012. Guidelines for Canadian Drinking Water Quality. Website: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2012-sum_guide-res_recom/index-eng.php. Accessed: August 2013.
- National Energy Board. 2013. Filing Manual. Inclusive of Release 2013-03 (August 2013). Calgary, AB.
- TERA Environmental Consultants. 2013. 2012 Post Construction Monitoring Report for the Trans Mountain Pipeline L.P. TMX - Anchor Loop Project. Prepared by TERA Environmental Consultants. Submitted to the NEB in January 2013.