ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT FOR THE TRANS MOUNTAIN PIPELINE ULC TRANS MOUNTAIN EXPANSION PROJECT

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EXECUTIVE SUMMARY

This socio-economic component of the Environmental and Socio-Economic Assessment (ESA) was completed in support of the proposed Trans Mountain Expansion Project (referred to as "TMEP" or "the Project"). (The biophysical component of the ESA is found in the companion Volume 5A.)

Application is being made by Trans Mountain Pipeline ULC (Trans Mountain), a Canadian corporation with its head office located in Calgary, Alberta, pursuant to Section 52 of the *National Energy Board Act* (*NEB Act*) for the TMEP.

The proposed expansion will, in essence, comprise the following.

- Pipeline segments that complete a twinning (or "looping") of the pipeline in Alberta and British Columbia 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 Project will require a NEB Certificate of Public Convenience and Necessity (CPCN) pursuant to Section 52 of the *NEB Act*. In addition, according to the Regulations Designating Physical Activities, the Project is a designated project under the *Canadian Environmental Assessment Act, 2012* (*CEA Act, 2012*). The ESA considers the mandatory factors listed in Section 19(1) of the *CEA Act, 2012*, the factors listed in the NEB *Filing Manual* (NEB 2013a), and pertinent issues and concerns identified through consultation and engagement with Aboriginal communities, landowners, regulatory authorities, stakeholders and the general public.

In addition, the ESA addresses the NEB's List of Issues (July 29, 2013) for the Project (NEB 2013b) provided below. Issues 4 and 5 of this list specifically informed the ESA.

1. *The need for the proposed project.*
2. *The economic feasibility of the proposed project.*
3. *The potential commercial impacts of the proposed project.*
4. *The potential environmental and socio-economic effects of the proposed project, including any cumulative environmental effects that are likely to result from the project, including those required to be considered by the NEB's Filing Manual.*
5. *The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed project, including the potential effects of accidents or malfunctions that may occur (addressed in Volume 8A).*
6. *The appropriateness of the general route and land requirements for the proposed project.*
7. *The suitability of the design of the proposed project.*
8. *The terms and conditions to be included in any approval the Board may issue.*
9. *Potential impacts of the project on Aboriginal interests.*
10. *Potential impacts of the project on landowners and land use.*
11. *Contingency planning for spills, accidents or malfunctions, during construction and operation of the project.*
12. *Safety and security during construction of the proposed project and operation of the project, including emergency response planning and third-party damage prevention.*

The Board does not intend to consider the environmental and socio-economic effects associated with upstream activities, the development of oil sands, or the downstream use of the oil transported by the pipeline.

Project Overview

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, 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 m^3/d (300,000 bbl/d) using 23 active pump stations and 40 petroleum storage tanks. The expansion will increase the capacity to 141,500 m^3/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; and
- 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 *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.

The scope of the Project will involve:

- using existing active 610 mm (NPS 24) and 762 mm (NPS 30) OD buried pipeline segments;
- constructing three new 914 mm (NPS 36) OD buried pipeline segments totalling approximately 987 km:
  - Edmonton to Hinton – 339.4 km
  - Hargreaves to Darfield – 279.4 km
  - Black Pines to Burnaby – 367.9 km;

- reactivating two 610 mm (NPS 24) OD buried pipeline segments that have been maintained in a deactivated state:
  - Hinton to Hargreaves – 150 km
  - Darfield to Black Pines – 43 km;
- constructing two, 3.6 km long 762 mm (NPS 30) OD buried delivery lines from Burnaby Terminal to Westridge Marine Terminal (the Westridge delivery lines);
- installing 23 new sending or receiving traps (16 on the Edmonton-Burnaby mainlines), for in-line inspection tools, at nine existing sites and one new site;
- adding 35 new pumping units at 12 locations (*i.e.*, 11 existing and one new pump station site);
- reactivating the existing Niton Pump Station that has been maintained in a deactivated state;
- constructing 20 new tanks located at the Edmonton (5), Sumas (1) and Burnaby (14) Terminals, preceded by demolition of 2 existing tanks at Edmonton (1) and Burnaby (1), for a net total of 18 tanks to be added to the system; and
- constructing one new dock complex, with a total of three Aframax-capable berths, as well as a utility dock (for tugs, boom deployment vessels, and emergency response vessels and equipment) at Westridge Marine Terminal, followed by the deactivation and demolition of the existing berth.

Volume 5B includes the socio-economic component of the Environmental and Socio-economic Assessment (ESA) for the Project (*i.e.*, the proposed pipeline corridor and associated facilities, including the expansion of the Westridge Marine Terminal). The biophysical component of the ESA for the Project is provided in Volume 5A. Volume 8A provides a discussion related to potential environmental and socio-economic effects of increased marine shipping activities as a result of the Project.

Public Consultation, Aboriginal Engagement and Landowner Relations

The Aboriginal engagement, stakeholder consultation, and landowner programs are designed to foster participation from the public who have an interest in the scope, activities and routing of the Project. Engagement and consultation touched on all aspects of the Project along the proposed pipeline corridor and associated facilities. Trans Mountain has reached out to community leaders, elected officials, environmental groups and the public to receive their input. Feedback was received from public open houses, workshops, one-on-one meetings, public presentations, online discussion and comment forums that have helped shape aspects of the Project. Key topics and issues were considered and incorporated into this volume where applicable.

Since April 2012, Trans Mountain has engaged with Aboriginal communities that may be affected by the Project or that may have an interest in the Project based on the proximity of their community, and their assertion of Aboriginal rights and title governing the traditional and cultural use of the land along the proposed pipeline corridor to maintain a traditional lifestyle. A number of methods have been used to inform Aboriginal communities, obtain feedback and identify issues about the Project including: community gatherings; face-to face meetings; targeted interviews; formal and informal discussions; and distribution of Project letters, newsletters, GIS data, maps and fact sheets as well as through the collection of Traditional Ecological Knowledge (TEK) with participating Aboriginal communities during biophysical field studies for the Project, Traditional Land Use (TLU) and socio-economic studies. The results of these engagement efforts have contributed to the development of the environmental assessment, including mitigation measures. Trans Mountain is committed to the continuation of an effective engagement program that satisfies all parties.

Trans Mountain has met with essentially all landowners along the proposed pipeline corridor. Meetings comprised discussions about the Project in general as well as requests for consent for Project-specific

surveys. The meetings also provided an opportunity for landowners to ask questions and identify concerns regarding the Project.

The questions, issues, or concerns raised by landowners were categorized most frequently related to compensation issues, land impacts, land values, site-specific pipeline location and issues related to the existing TMPL line (see Volume 3B).

Landowners of approximately 85% of all tracts of land raised no comments or concerns at this phase of the program. Of those that did comment within Alberta, concerns are about environmental and land-related issues. In BC, the primary concerns relate to environmental and compensation/financial issues. Trans Mountain will continue to respond to concerns and issues of each landowner or occupant.

Corridor and Facility Site Selection

More than two thirds of the length of the proposed pipeline corridor parallels the existing TMPL right-of-way in order to reduce the socio-economic effects and facilitate efficient pipeline operations. However, paralleling the existing TMPL right-of-way was not possible in all cases because of engineering, constructability, geotechnical, environmental, socio economic, Aboriginal concerns or other reasons. In these locations, potential alternative corridors were examined. While the proposed pipeline will generally require a construction right-of-way of 45 m, it was decided to study and apply for a wider corridor (generally 150 m) to accommodate locations where field information was unavailable due lack of access to public lands or where input from environmental, socio-economic, geotechnical or other disciplines would be beneficial to guide final placement of the proposed pipeline centreline and associated right-of-way. It is recognized that corridor and route refinement is an iterative process that will continue throughout the application process of the Project as more information becomes available.

Site selection criteria primarily were used to choose the sites where facility sites will be located, including the pump stations and associated power lines, storage tanks, and mainline block valves. Site selection is primarily focused on reducing disturbance by using existing facility locations to the extent possible. Similar site selection criteria will be applied to select temporary facility sites and construction workspace.

Socio-Economic Setting

Lands traversed by the proposed pipeline corridor include: agricultural lands (disturbed by plowing for cultivation); hay and tame pasture; areas of aspen woodlands and mixed aspen forest; treed pasture; native vegetation; urban; industrial; and parks. Numerous waterbodies are crossed by and in proximity to the proposed pipeline corridor.

Socio-economic setting information along the proposed pipeline corridor and at facilities is provided in this volume for the following elements identified in the NEB *Filing Manual*:

- heritage resources;
- traditional land and resource use;
- social and cultural well-being;
- human occupancy and resource use;
- infrastructure and services;
- navigation and navigation safety;
- employment and economy;
- community health; and
- human health.

Setting information is also provided for traditional marine resource use and marine commercial, recreation and tourism use.

The socio-economic setting was compiled based on the following sources:

- heritage resources, traditional land and resource use, socio-economic, community health, economic studies, and human health risk assessment conducted for the Project;
- existing published literature including topographic maps, aerial photography, scientific papers and reference books, as well as municipal, provincial and federal government maps, reports, interactive websites, guides, information letters, fact sheets, and databases; and
- engagement with Aboriginal communities (including TLU studies, socio-economic studies and biophysical field study participation) as well as consultation with landowners, regulatory authorities, stakeholders and the general public.

The settings for each element are discussed by the six socio-economic regions that have been designated for the purposes of this assessment. The socio-economic regions are defined by political and administrative boundaries that are relevant to service delivery and governance for the communities and residents who might have direct or indirect interactions with the Project. The use of the socio-economic regions allows more precision in the estimates of potential socio-economic effects since they follow jurisdictional boundaries for service delivery and governance and, therefore, align with available data. These regions also align with a local “sense of place” and assist stakeholders in understanding how the socio-economic components of the assessment reflect local and regional interests. The six socio-economic regions for this assessment are the:

- Edmonton Region;
- Rural Alberta Region;
- Jasper National Park Region;
- Fraser-Fort George/Thompson-Nicola Region;
- Fraser Valley Region; and
- Metro Vancouver Region.

The settings for each element are also discussed in the context of the Footprint of the Project, a Local Study Area and a Regional Study Area. The Socio-economic Regional Study Area, for which most of the elements in this volume are described, considers communities close enough to the Project to potentially be a: source of labour; source of procured goods or services; location of community infrastructure/services influenced by the Project; accommodation or camp location for Project workers; or Project construction office location. This includes the counties and regional districts crossed by the proposed pipeline corridor (or certain regional subareas), and communities approximately 50 km from the proposed pipeline corridor that could participate in or be affected by the Project. It also includes Aboriginal communities whose reserves or traditional territory is crossed by the proposed pipeline corridor.

Information in the socio-economic setting is supported by several supporting studies provided in Volume 5D, including:

- Traditional Land and Resource Use Technical Report;
- Socio-Economic Technical Report;
- Worker Expenditures Along the Proposed Pipeline Corridor Technical Report;
- Managed Forest Areas and Forest Health Technical Report;
- Viewshed Modelling Analysis Technical Report;

- Agricultural Assessment Technical Report;
- Community Health Technical Report; and
- Screening Level Human Health Risk Assessment of Pipeline and Facilities Technical Report.

Socio-Economic Effects Assessment

Socio-economic elements potentially interacting with the Project include heritage resources, traditional land and resource use, traditional marine resource use, social and cultural well-being, human occupancy and resource use, infrastructure and services, navigation and navigation safety, employment and economy, community health, and human health risk assessment. The description of the socio-economic setting (current state of the socio-economic environment) within the Project area was compared against the Project description to assess potential socio-economic effects that might be caused by the Project. For this assessment, one or more indicators (*i.e.*, a biophysical, social or economic property or variable that society considers to be important, and is assessed to predict Project-related changes and focus the impact assessment on key issues, often referred to as Valued Ecosystem or Valued Socio-economic Components) were selected to describe the present and predicted future condition of an element. One or more measurement endpoints (measurable parameters) were identified for each indicator to allow quantitative or qualitative measurement of potential Project effects.

The assessment evaluates the socio-economic effects of the construction (including reactivation/modification), operation, decommissioning and abandonment phases of each component of the Project. The assessment method includes the following steps.

1. Describe the socio-economic setting.
2. Identify key socio-economic elements that could be affected.
3. Define the indicators and measurement endpoints to be used to assess each element.
4. Determine spatial and temporal boundaries for each element.
5. Identify potential socio-economic effects for each indicator.
6. Develop appropriate technically and economically feasible site-specific mitigation and, where warranted, enhancement/restitution measures that are technically and economically feasible.
7. Predict anticipated residual effects.
8. Determine the significance of residual effects.

Socio-economic effects arising from potential accidents and malfunctions are also considered. However, large onshore spill scenarios (including Westridge Marine Terminal) and marine spills are discussed in Volumes 7 and 8A, respectively. Changes to the Project caused by the environment were not considered to interact with the socio-economic environment and, therefore, are not discussed in this volume. Changes to the Project caused by the environment are, however, discussed in Volume 5A.

To ensure that the potential adverse socio-economic effects are eliminated or reduced and potential positive socio-economic effects are enhanced during Project activities, general and site-specific mitigation and enhancement measures have been recommended based upon current industry-accepted standards, consultation with regulatory authorities, interested groups and individuals, engagement with Aboriginal communities, and the professional judgment of the assessment team.

Mitigation and enhancement measures are presented in the Project-specific Environmental Protection Plans (EPPs) (Volumes 6B through 6D). Mitigation and enhancement measures that will be implemented by Trans Mountain to address certain socio-economic issues and opportunities not addressed by the EPPs are summarized in the Socio-economic Management Plan (Appendix C of Volume 6B). Mitigation measures developed from element-specific technical reports are incorporated into the assessment. In addition, various federal and provincial regulatory authorities, and industry-accepted standards and guidelines are considered in this assessment and are referenced for each element.

Most of the potential effects on socio-economic indicators arising from construction of the Project can be readily mitigated by standard socio-economic mitigation measures common to pipeline projects in similar settings. There are no situations that meet the criteria of a significant adverse residual socio-economic effect as defined in Section 7.1 of this volume. Consequently, the identified adverse residual effects of construction and operation of the Project on socio-economic indicators will be not significant for the pipeline and facilities component of the Project. There are, however, several positive residual socio-economic effects associated with the Project, of which two were identified as being significant: provincial and national economic benefits; and increased municipal taxes in Footprint communities.

The Project was evaluated with respect to the objectives and goals of relevant land and resource use management plans, municipal development plans, and government policies of the communities, counties and regional districts traversed by the proposed pipeline corridor and facilities. The planning, design, construction and operation of the Project will be consistent with key actions or objectives of these plans. In addition, for each element, it was determined that the Project does not hinder the ability of the respective agency to fulfill the relevant goals or objectives of these plans.

Cumulative Effects Assessment

The Project may act cumulatively with existing activities and reasonably foreseeable developments in the vicinity of the Project including agriculture (*e.g.*, crop production and livestock grazing), forestry, recreational activities, transportation activities (*e.g.*, vehicle and rail traffic, road infrastructure and highway maintenance), utilities activities (*e.g.*, transmission lines and gas distribution lines), rural and urban residential and commercial development, and industrial, oil and gas, and mineral resources developments. Cumulative effects associated with the Project were evaluated on a conservative basis for the element under consideration. Most of the Project's contribution to cumulative effects within the element-specific LSAs and RSAs that are likely to occur, are anticipated to be reversible in the short to long-term and are generally of low to medium magnitude. There are no situations that would result in a significant adverse cumulative socio-economic effect from the pipeline and facilities component of the Project, as defined in Section 7.1.

Supplemental Studies

Supplemental (ongoing) studies may be warranted as the route is refined and optimized. At some locations, access for environmental and resource survey was also not available at the time of field study. In those situations, information on adjacent lands, desktop studies and professional judgment based on the team's familiarity with pipeline issues and mitigation were used to predict potential effects. Ongoing studies will support effects assessment predictions and refine and augment site-specific environmental protection planning. Land access was available at intervals in all segments of the entire proposed pipeline corridor. Studies are proposed for heritage resources, traditional land and resource use and traditional marine resource use. If findings change or significantly different conditions are observed that information will be provided to the NEB. The respective scope and timing (field and reporting schedule) for the planned supplemental filings are described in Section 9.0.

Current mitigation, management and contingency plans have been conservatively developed to address the expected findings from the ongoing studies and have been based on professional judgment relying on continuity of adjoining land parcels for which comprehensive field studies have been completed. The additional study requirements are not anticipated to change the significance conclusions in Sections 7.0 and 8.0 of Volume 5B.

Follow-up

Under the *CEA Act, 2012* and as described in the NEB *Filing Manual*, a follow-up program is defined as a program to verify the accuracy of the environmental assessment of a designated project, and to determine the effectiveness of any mitigation measures. Based on Project knowledge and comprehensive field studies to date, the need for follow-up programs under the *CEA Act, 2012* have been identified for select wildlife species at risk and various indicators within the Socio-economic Management Plan. Trans Mountain plans to collect additional information in 2014 to inform and refine the mitigation strategies recommended in the Environmental Protection Plans.

Conclusion

The socio-economic assessment indicates that the proposed pipeline and associated facilities (*e.g.*, pump stations, terminals, Westridge Marine Terminal) does not result in significant adverse residual socio-economic effects as defined in Section 7.1. Consequently, the identified residual effects of construction and operation of the pipeline and facilities component of the Project on socio-economic indicators will be not significant. There are, however, two significant positive residual socio-economic effects identified, namely provincial and national economic benefits as well as increased municipal taxes in Footprint communities.

The socio-economic issues identified through engagement with Aboriginal communities, and consultation with landowners, regulatory authorities, stakeholders and the general public, as well as through literature reviews, field studies and the professional experience of the assessment team, are consistent with other projects of this nature. Most of the associated potential effects on socio-economic indicators arising from construction of the Project can be readily mitigated by standard environmental mitigation measures common to pipeline projects in similar settings.

Project design and industry and regulatory standards anticipate and address many of the Project's potential residual effects on the socio-economic environment. Routing of the proposed pipeline corridor to parallel existing linear disturbances for most of its length (89%) has reduced the potential effects associated with construction and operation of the Project. Mitigation measures have been developed to further reduce the severity of potential adverse residual environmental effects. Implementation of the proposed mitigation measures will further reduce the adverse residual environmental effects associated with the construction and operation of the Project. Enhancement measures have been developed to promote the likelihood of potential socio-economic residual effects where a positive impact balance was identified. Applicable proposed construction mitigation measures will form the basis of operation and maintenance procedures during the life of the Project.

GLOSSARY

Aboriginal Traditional Knowledge (ATK)	Knowledge that is held by, and unique to, Aboriginal peoples.
adverse effect	The impairment of or damage to the environment or the health of humans, or damage to property or loss of reasonable enjoyment of life or property.
Agricultural Land Reserve	Administered by the Agricultural Land Commission, the Agricultural Land Reserve is a provincial zone in which agriculture is recognized as the priority use and non-agricultural uses are controlled.
anthropogenic	Materials modified by human activities so that the original properties of the material have been altered.
appropriate regulatory authority	The regulator(s) that will be consulted prior to and during construction regarding approvals, notifications, constraints and the direction of activities.
archaeological site	A site composed of artefacts associated with a prehistoric period that precedes written record.
automated mainline block valves	Enable remotely operated automatic emergency shut-down and isolation of the pipeline along a given segment.
avoidance	A means to prevent a potential adverse effect through routing/siting of the project, changes to project design or construction timing.
compensation	A means intended to compensate unavoidable and potentially significant or unacceptable effects and may consist of offsets (no net loss), research, education programs, and financial compensation (considered only when all other options have been exhausted).
construction hub/ hub community	A community where staging of construction activity and accommodation of workers is anticipated to be focused.
construction right-of-way	Right-of-way area comprised of temporary workspace and the permanent easement that is disturbed during construction. Consists of four newly constructed 914 mm OD (NPS 36) pipeline segments from: Edmonton to Hinton, Alberta; Hargreaves to Darfield, BC; Black Pines to Hope, BC; Hope to Burnaby, BC; and one newly constructed pipeline segment containing two 762 mm OD (NPS 30) pipelines from Burnaby to the Westridge Marine Terminal.
cultivated land	Agricultural land use where the ground is usually tilled or disturbed regularly.
cumulative effects	Changes to the environment that are caused by an action in combination with other past, present and future human actions (“action’ includes projects and activities).
element	A technical discipline or discrete component of the biophysical or human environment identified in the NEB *Filing Manual.*
enhancement measure	A recommendation that aims to promote the likelihood of potential positive environmental or socio-economic residual effects.
Environmental Alignment Sheets	A series of maps noting the locations of select environmental features that are encountered by the proposed pipeline corridor, associated potential issues and recommended mitigation measures.
feasible	Capable of being reasonably accomplished or brought about, given environmental and economic consideration.
Footprint	The area directly disturbed by surveying, construction and clean-up and operation of the pipeline and associated physical works and activities (including, where appropriate, the permanent rights-of-way, pump stations, tanks, Westridge Marine Terminal, temporary construction workspace, temporary stockpile sites, temporary staging sites, construction camps, access roads and power lines).
historic site	An area of human activity that was created after the appearance of writing and before the last 50 years.
historic structure	An above ground structure dating prior to 50 years before present.
Indian Reserve	A tract of land, the legal title to which is vested in Her Majesty, that has been set apart by Her Majesty for the use and benefit of a band.

GLOSSARY Cont'd

indicator	A biophysical, social or economic property or variable that society considers to be important and is assessed to predict Project-related changes and focus the effects assessment on key issues. One or more indicators (often referred to as Valued Ecosystem or Valued Socio-economic Components) are selected to describe the present and predicted future condition of an element. Societal views are understood by the assessment team through published information such as management plans and engagement with regulatory authorities, the public, Aboriginal communities, and other interested groups.
International Area	The area extending beyond Canada.
Kinder Morgan Canada Inc.	Kinder Morgan Canada Inc. (KMC) is a corporation owned by Kinder Morgan Energy Partners. KMC operates Trans Mountain Pipeline L.P., a general partner of Trans Mountain Pipeline ULC (Trans Mountain).
Local Study Area	The zone of influence or area where the element and associated indicators are most likely to be affected by Project construction and operation. This generally represents a buffer from the centre of the proposed pipeline corridor.
Lower Mainland Developed Area	Urban and agricultural area in the Fraser Valley including the City of Chilliwack, City of Abbotsford, Township of Langley, City of Surrey, City of Coquitlam and City of Burnaby.
measurement endpoint	One or more measurement endpoints are identified for each indicator to allow quantitative or qualitative measurement of potential Project effects. The degree of change in these measurable parameters is used to characterize and evaluate the magnitude of Project-related environmental and socio-economic effects. A selection of the measurement endpoints may also be the focus of monitoring and follow-up programs, where applicable.
merchantable timber	Timber that will be sold to a timber processor.
mitigation measure	Mean measures for the elimination, reduction or control of a project's adverse environmental effects, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means, or a means of reducing or managing a project's adverse socio-economic effects.
National Area	The area extending beyond Alberta and BC but confined to Canada.
National Energy Board	An independent federal agency established in 1959 by the Parliament of Canada to regulate international and interprovincial pipelines and associated facilities.
native grassland	Lands dominated by native grasses and forbs, generally exhibiting a high species diversity, abundant grass thatch and little evidence of regular ground disturbance.
navigable water	Considered to be any body of water that does not meet the criteria of a Class 1 or Class 2 non-navigable water, as defined under the Minor Navigable Waters of the *Minor Works and Waters* (*NWPA*) *Ministerial Order*, or a potentially non-navigable water (Class 3) as defined in the Fisheries (Alberta) and Fisheries (British Columbia) Technical Reports (Volume 5C).
non-salvageable timber	Timber and woody debris that will not be used during and after pipeline construction that is deposed of.
nuisance	For the purposes of this assessment, an effect considered to be of nuisance value is considered to be one that is perceptible and may result in annoyance (*e.g.,* nuisance air emissions may include dust during construction while nuisance noise emissions may include noise from construction equipment).
palaeontological resource	There are two types of palaeontological resources, body fossils and trace fossils. Body fossils are the remnants of an organism, such as a skeleton or leaf imprint, that is embedded and preserved within the earth's crust. Trace fossils consist of tracks, burrows, coprolites and marks left by feeding which reflect the organisms' behaviours.
Port Metro Vancouver	A non-shareholder, financially self-sufficient corporation established by the Government of Canada and accountable to the federal Minister of Transport, responsible for the operation and development of the assets and jurisdictions of over 600 km of shoreline, extending from Point Roberts at the Canada/US border through Burrard Inlet to Port Moody and Indian Arm, and from the mouth of the Fraser River eastward to the Fraser Valley.
practical	Capable of or suitable to being put into effect, given environmental and economic consideration.
proposed pipeline corridor	Generally a 150 m wide corridor encompassing the pipeline construction right-of-way and temporary workspace.

GLOSSARY Cont'd

Provincial Area	The area extending beyond regional or administrative boundaries, but confined to Alberta and BC.
reclamation	The process of establishing a recovery trajectory to allow the land to re-establish its former or other productive use. The land will have the ability to support the land use that existed prior to the disturbance, but may support a different land use depending on the land management goals following the disturbance. Soils will be managed at contaminated sites to facilitate vegetation cover re-establishment suited to the post-disturbance land use. Reclamation will be considered complete once landscape, soils and vegetation goals for reclamation have been achieved.
Reference Kilometres	Distances measured along the general centre of the proposed pipeline corridor, referred to as Reference Kilometres (RKs), measured approximately 1 km apart.
Regional Study Area	The area extending beyond the Local Study Area boundary where the direct and indirect influence of other activities could overlap with Project-specific effects and cause cumulative effects on the environmental or socio-economic indicator. This varies for each element.
residual effects	Effects that are present after mitigation and enhancement measures are applied.
right-of-way	A legally defined strip of land with defined boundaries in which the pipeline runs through properties owned by others.
root zone material	Organic matter rich surface soil found within shrub, treed or forested land uses.
salvageable timber	Merchantable timber without a market or non-merchantable timber salvaged for use during and after pipeline construction.
salvageable timber	Merchantable timber without a market or non-merchantable timber salvaged for use during and after pipeline construction.
shoo-flies	Vehicle and equipment access to the construction right-of-way from each side of a watercourse crossing where vehicle and equipment crossing of the watercourse on the right-of-way is not practical.
significant contribution to a cumulative socio-economic effect	The Project's contribution to a cumulative socio-economic effect is considered significant if the Project's contribution to the effect is predicted to be: • high magnitude, high probability, short to medium-term reversibility and regional, provincial or national in extent that cannot be technically or economically mitigated; or • high magnitude, high probability, long-term or permanent reversibility and any spatial boundary that cannot be technically or economically mitigated.
significant residual socio-economic effect	A residual socio-economic effect is considered significant if the effect is predicted to be: • high magnitude, high probability, short to medium-term reversibility and regional, provincial or national in extent that cannot be technically or economically mitigated; or • high magnitude, high probability, long-term or permanent reversibility and any spatial boundary that cannot be technically or economically mitigated.
supplemental (ongoing) studies	Studies to be conducted post submission of the application to confirm the effects assessment conclusions and gather site-specific information for the implementation of mitigation from the Project-specific Environmental Protection Plans.
tame pasture	Agricultural land use which is dominated by perennial, non-native grasses and forbs, which is used primarily for livestock grazing.
topsoil	Organic matter rich surface soil developed within a grassland land use.
Traditional Ecological Knowledge (TEK)	A subset of ATK that is primarily concerned with the environment.
traditional land use (TLU)/ traditional land and resource use (TLRU)/ traditional marine resource use (TMRU)	Current and former use of the land/water and its resources by Aboriginal peoples.
warranted	Justify or necessitate a course of action.

GLOSSARY Cont'd

Westridge Marine Terminal	Trans Mountain-owned marine loading facility located within Port Metro Vancouver that can accommodate ships up to 120,000 deadweight tonnes and barges. This facility also receives jet fuel, which is delivered to Vancouver International Airport through Trans Mountain's affiliate, Trans Mountain (Jet Fuel) Inc. The Westridge Marine Terminal has been in operation since 1957.

ABBREVIATIONS AND ACRONYMS

AAC	Annual Allowable Cut
AADT	average annual daily traffic
AADTM	average annual daily traffic by month
AB	Alberta
ACCESS	ACCESS Pipeline Inc.
ACIMS	Alberta Conservation Information Management System
AEAE	Alberta Enterprise and Advanced Education
AENV	Alberta Environment
AER	Alberta Energy Regulator
AESO	Alberta Electric System Operator
AESRD	Alberta Environment and Sustainable Resource Development
AHS	Alberta Health Services
AIA	Archaeological Impact Assessment
Ajax	KGHM Ajax Mining Inc.
Ajax Project	Ajax Copper/Gold Project
ALR	Agricultural Land Reserve
AltaLink	AltaLink Management Ltd.
AMEC	AMEC Earth & Environmental
ATCO Electric	ATCO Electric Ltd.
ATCO Gas	ATCO Gas and Pipelines Ltd.
ATK	Aboriginal Traditional Knowledge
ATPR	Alberta Tourism, Parks and Recreation
ATV	all-terrain vehicle
AUC	Alberta Utilities Commission
bbl	barrels
bbl/d	barrels per day
BC	British Columbia
BC EAO	BC Environmental Assessment Office
BC Hydro	BC Hydro and Power Authority
BC ILMB	Integrated Land Management Bureau
BC MFLNRO	BC Ministry of Forests, Lands and Natural Resources Operations
BC MJTST	BC Ministry of Jobs, Tourism and Skills Training
BC MOE	BC Ministry of Environment
BC MOH	BC Ministry of Health
BC MOT	BC Ministry of Transportation
BC MTI	BC Ministry of Transportation and Infrastructure
BC OGC	BC Oil and Gas Commission
BCAS	BC Ambulance Service
BCCP	BC Coast Pilots
BCIT	BC Institute of Technology
BCMF	BC Métis Federation
BCUC	BC Utilities Commission
BGC Zone	Biogeoclimatic Zone
BIEAP	Burrard Inlet Environmental Action Program
BNSF	Burlington Northern Santa Fe Corp.
Brookfield	Brookfield Renewable Power Inc.
CAPP	Canadian Association of Petroleum Producers
CCG	Canadian Coast Guard
CD	census division
CEA Act, 2012	*Canadian Environmental Assessment Act, 2012*
CEA Agency	Canadian Environmental Assessment Agency

ABBREVIATIONS AND ACRONYMS Cont'd

CFN	Cheam First Nation
CHRS	Canadian Heritage Rivers System
CMA	census metropolitan area
CMHC	Canadian Mortgage and Housing Corporation
CMT	culturally modified tree
CN	Canadian National Railway Company
Coalspur	Coalspur Mines Ltd.
COPD	chronic obstructive pulmonary disorder
CPCN	Certificate of Public Convenience and Necessity
CPR	Canadian Pacific Railway
CSA	Canadian Standards Association
CSC	Construction Sector Council
DFO	Fisheries and Oceans Canada
EMR	emergency medical responders
EMS	emergency medical services
EMT	Emergency Medical Technologist
EMT-P	Emergency Medical Technologist – Paramedic
Enbridge	Enbridge Pipelines Inc.
ENGO	environmental non-government organizations
Enhance	Enhance Energy Inc.
EPCOR	EPCOR Distribution and Transmission Inc.
EPP	Environmental Protection Plan
ERA	Ecological Risk Assessment
ERCB	Alberta Energy Resources Conservation Board
ESA	Environmental and Socio-economic Assessment
EWMC	Edmonton Waste Management Centre
FEARO	Federal Environmental Assessment Review Office
FHA	Fraser Health Authority
FMA	Forest Management Agreement
FNFNES	First Nations Food, Nutrition and Environment Study
Footprint	Footprint Study Area
FortisBC	FortisBC Energy Inc.
FOTS	fibre-optic transmission system
FREMP	Fraser River Estuary Management Program
FVRD	Fraser Valley Regional District
FVREB	Fraser Valley Real Estate Board
GDP	gross domestic product
GHG	greenhouse gas
GI	gastrointestinal
GIS	geographic information system
Grand Rapids	Grand Rapids Pipeline GP Ltd.
GVRD	Greater Vancouver Regional District
GVSDD	Greater Vancouver Sewerage and Drainage District
GVWD	Greater Vancouver Water District
ha	hectare
HDD	horizontal directional drill
HHRA	Human Health Risk Assessment
HORU	human occupancy and resource use
HP	horsepower
HRA	*Historical Resources Act*
HRIA	Historical Resources Impact Assessment

ABBREVIATIONS AND ACRONYMS Cont'd

HRO	Historical Resources Overview
HRV	Historical Resources Value
HSDA	health service delivery area
ICA	Integrated Cultural Assessment
ICS	Incident Command System
IHS Inc.	Information Handling Services Inc.
Inter Pipeline	Inter Pipeline Ltd.
IR	Indian Reserve
JAMES	Joint Abbotsford Mission Environmental Systems
KDCC	KDC Consulting
KEEP Canada	Knowledge and Experience Enhancement Program Canada
km	kilometre
KMC	Kinder Morgan Canada Inc.
KP	kilometre post
kV	kilovolt
Lifeways	Lifeways Canada Ltd.
LMDA	Lower Mainland Developed Area
LOU	Letter of Understanding
LRMP	land and resource management plan
LRT	light rail transit
LSA	Local Study Area
m	metre
MADT	monthly average daily traffic
MAXIM	MAXIM Power Corp.
MBA	Mutual Benefit Agreement
MCRTU	marine commercial, recreational and tourism use
MCTS	Marine Communication and Traffic Services
MDP	municipal development plan
MLBV	mainline block valve
mm	millimetre
MNBC	Métis Nation of BC
MPMO	Major Projects Management Office
MPOI	maximum point of impingement
MRA	movement restriction area
MU	management unit
MVA	megavolt ampere
MW	megawatt
NAIT	Northern Alberta Institute of Technology
NDIT	Northern Development Initiatives Trust
NEB	National Energy Board
NEB Act	*National Energy Board Act*
NEB OPR	*National Energy Board Onshore Pipeline Regulations*
New Gold	New Gold Inc.
NGPLP	Northern Gateway Pipelines Ltd. Partnership
NHS	National Household Survey
NM	nautical mile
NPS	nominal pipe size
NWPA	*Navigable Waters Protection Act*
OCP	official community plan
OD	outside diameter
OPAC	Online Permitting and Clearances

ABBREVIATIONS AND ACRONYMS Cont'd

PCEM	Post-Construction Environmental Monitoring
PHRCC	Petroleum Human Resources Council of Canada
PMV	Port Metro Vancouver
PTP	Pacific Trails Pipeline Limited Partnership
RAP	Restricted Activity Period
RCMP	Royal Canadian Mounted Police
RDFFG	Regional District of Fraser-Fort George
REBGV	Real Estate Board of Greater Vancouver
RGS	regional growth strategy
RHS	regional health survey
RK	reference kilometer
RMZ	riparian management zone
RSA	Regional Study Area
RV	recreational vehicle
Sasol	Sasol Canada Holdings Ltd.
Seaspan	Seaspan ULC
SEMP	Socio-economic Management Plan
SFPR	South Fraser Perimeter Road
Shell	Shell Canada Ltd.
Sherrit	Sherrit International Corporation
SRMP	sustainable resource management plan
SRY	Southern Railway of British Columbia
SSN	Stk'emlupsemc te Secwepemc Nation
STARS	Shock Trauma Air Rescue Society
STI	sexually transmitted infection
TB	tuberculosis
Teck	Teck Resources Ltd.
TEK	Traditional Ecological Knowledge
Telus	Telus Communications Corp.
TERA	TERA Environmental Consultants
TERMPOL	Technical Review Process of Marine Terminal Systems and Transshipment Sites
TEU	twenty-foot equivalent unit
the Project	Trans Mountain Expansion Project
TIABC	Tourism Industry Association of British Columbia
TLU/TLRU/TMRU	traditional land use / traditional land and resource use / traditional marine resource use
TMEP	Trans Mountain Expansion Project
TMPL	Trans Mountain pipeline
TNRD	Thompson-Nicola Regional District
Trans Mountain	Trans Mountain Pipeline ULC
TransAlta	TransAlta Corp.
TransCanada	TransCanada PipeLines Limited
TSA	Timber Supply Area
TTML	Ts'elxwéyeqw Tribe Management Limited
TUC	Transportation/Utility Corridor
TUS	Traditional Use Study
UBC	University of British Columbia
UBCM	Union of British Columbia Municipalities
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
VARDA	Valemount Area Recreation Development Association
VCHA	Vancouver Coastal Health Authority

ABBREVIATIONS AND ACRONYMS Cont'd

VEC and VSC	valued environmental and social component
Vista Project	Vista Coal Mine Project
VMA	viewshed modeling analysis
VQO	visual quality objective
WCMRC	Western Canada Marine Response Corporation
West Fraser	West Fraser Mills Ltd.
Weyerhaeuser	Weyerhaeuser Company Ltd.
WMU	Wildlife Management Unit
YVR	Vancouver International Airport
YXX	Abbotsford International Airport
ZOI	zone of influence

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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 m^3/d (300,000 bbl/d) using 23 active pump stations and 40 petroleum storage tanks. The expansion will increase the capacity to 141,500 m^3/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.

The scope of the Project will involve:

- using existing active 610 mm (NPS 24) and 762 mm (NPS 30) OD buried pipeline segments;
- constructing three new 914 mm (NPS 36) OD buried pipeline segments totalling approximately 987 km:
  - Edmonton to Hinton – 339.4 km
  - Hargreaves to Darfield – 279.4 km

  - Black Pines to Burnaby – 367.9 km;

- reactivating two 610 mm (NPS 24) OD buried pipeline segments that have been maintained in a deactivated state:

  - Hinton to Hargreaves – 150 km

  - Darfield to Black Pines – 43 km;

- constructing two, 3.6 km long 762 mm (NPS 30) OD buried delivery lines from Burnaby Terminal to Westridge Marine Terminal (the Westridge delivery lines);

- installing 23 new sending or receiving traps (16 on the Edmonton-Burnaby mainlines), for in-line inspection tools, at nine existing sites and one new site;

- adding 35 new pumping units at 12 locations (*i.e.*, 11 existing and one new pump station site);

- reactivating the existing Niton Pump Station that has been maintained in a deactivated state;

- constructing 20 new tanks located at the Edmonton (5), Sumas (1) and Burnaby (14) Terminals, preceded by demolition of 2 existing tanks at Edmonton (1) and Burnaby (1), for a net total of 18 tanks to be added to the system; and

- constructing one new dock complex, with a total of three Aframax-capable berths, as well as a utility dock (for tugs, boom deployment vessels, and emergency response vessels and equipment) at Westridge Marine Terminal, followed by the deactivation and demolition of the existing berth.

Figure 1.1 provides an overview of the location of the Project.

TRANS MOUNTAIN

FIGURE 1.1

PROJECT OVERVIEW
ALBERTA AND BRITISH COLUMBIA

TRANS MOUNTAIN
EXPANSION PROJECT

- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- New Pump Station (Proposed)
- Pump Station (Reactivated)
- Existing Pump Station
- Highway
- Railway
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Provincial Boundary
- International Boundary

Projection: LCC Modified. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrastructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: Copyright:© 2009 ESRI.

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TERA ENVIRONMENTAL CONSULTANTS

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

MAP NUMBER			PAGE
201307_MAP_TERA_ESA_00341_REV0			SHEET 1 OF 1
DATE	TERA REF.		REVISION
December 2013	7894		0
SCALE	PAGE SIZE		DISCIPLINE
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ALL LOCATIONS APPROXIMATE

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1.2 Purpose of the Socio-Economic Assessment

As described in Section 3.0 of Volume 2, the Project will require a NEB CPCN pursuant to Section 52 of the *NEB Act* because the proposed pipeline crosses a provincial border and is greater than 40 km in length. In addition, according to the *Regulations Designating Physical Activities,* the Project is a designated project under the *Canadian Environmental Assessment Act, 2012* (*CEA Act, 2012*) because the new pipeline is greater than 40 km. The Environmental and Socio-economic Assessment (ESA) prepared for the Project considers the mandatory factors listed in Section 19(1) of the *CEA Act, 2012*, the factors listed in the NEB *Filing Manual* (NEB 2013a), and pertinent issues and concerns identified through consultation and engagement with Aboriginal communities, landowners, regulatory authorities, stakeholders and the general public.

Trans Mountain understands that the NEB will conduct the review of the TMEP under the *NEB Act* as well as the *CEA Act, 2012.*

The Project is federally regulated and subject to obtaining a CPCN from the NEB and complying with the terms and conditions imposed by the NEB. Trans Mountain intends to work with Provincial regulatory authorities, municipal authorities and other agencies to provide them the information they need to fulfill their permitting requirements if the NEB approves the Project. Examples of these authorizations are listed in Section 1.5 of Volume 2.

1.2.1 Scope of the Project

According to the NEB *Filing Manual*, the scope of the Project includes the activities and components required to carry out the Project and allow it to proceed. This combination of activities for pipelines and facilities is provided in Section 1.1.

There will be additional marine traffic to move the product from the Project. Although regulation and authorization of marine transportation is not specifically within the jurisdiction of the NEB, the environmental and socio-economic effects of the increased marine traffic is considered by Trans Mountain in accordance with the NEB's direction from their *List of Issues* for the Project, released on July 29, 2013 (NEB 2013b). The predicted increase in marine traffic related to the Project is discussed in Volume 8A, Marine Transportation. Volume 8A addresses the requirements of the NEB's *List of Issues* (July 29, 2013) (NEB 2013b) as they relate to increased marine shipping resulting from the Project, the *CEA Act, 2012*, and the NEB's *Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project* (September 10, 2013) (NEB 2013c).

The potential effects of an operational pipeline or marine spill are evaluated in Volumes 7 and 8A, respectively, including the risk of a spill, spill response plans, and the potential effects of hypothetical spill scenarios. The evaluation of the hypothetical spill scenarios also includes a Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA).

1.2.2 Scope of the Assessment

Scoping is the process of identifying the physical works and activities to include within the ESA, and the biophysical and socio-economic elements are likely to be affected by the Project. Proper scoping reduces the risk of including unimportant or irrelevant information in the assessment or excluding factors that should be assessed (NEB 2013a).

The NEB's *List of Issues* (July 29, 2013) for the Project (NEB 2013b) is provided below. Issues 4 and 5 of this list specifically informed the ESA.

1. *The need for the proposed project.*
2. *The economic feasibility of the proposed project.*
3. *The potential commercial impacts of the proposed project.*

4. *The potential environmental and socio-economic effects of the proposed project, including any cumulative environmental effects that are likely to result from the project, including those required to be considered by the NEB's Filing Manual.*
5. *The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed project, including the potential effects of accidents or malfunctions that may occur (addressed in Volume 8A).*
6. *The appropriateness of the general route and land requirements for the proposed project.*
7. *The suitability of the design of the proposed project.*
8. *The terms and conditions to be included in any approval the Board may issue.*
9. *Potential impacts of the project on Aboriginal interests.*
10. *Potential impacts of the project on landowners and land use.*
11. *Contingency planning for spills, accidents or malfunctions, during construction and operation of the project.*
12. *Safety and security during construction of the proposed project and operation of the project, including emergency response planning and third-party damage prevention.*

> *The Board does not intend to consider the environmental and socio-economic effects associated with upstream activities, the development of oil sands or the downstream use of the oil transported by the pipeline.*

Recognizing the scope of the assessment described above, Trans Mountain must submit an ESA for the proposed pipeline and facilities. Trans Mountain's ESA includes a description of the following:

- the environmental and socio-economic setting;
- the predicted beneficial and adverse effects of the proposed Project on the socio-economic and biophysical environment over the life of the Project;
- the methods used for effects analysis, and the rationale for selecting the methods chosen;
- the proposed inspection, monitoring and mitigation measures; and
- the predicted significance of residual Project effects and residual cumulative effects.

The socio-economic assessment considers the mandatory factors listed in Section 19(1) of the *CEA Act, 2012,* the factors listed in the NEB *Filing Manual* (NEB 2013a), and pertinent issues and concerns identified through Aboriginal engagement and consultation with landowners, regulatory authorities, stakeholders, and the general public. It should be noted that Aboriginal engagement and stakeholder consultation does not end with the filing of the application to the NEB. Engagement, consultation as well as refinement of the environmental and socio-economic mitigation measures, continue through the next phases of the regulatory process and project execution.

The socio-economic assessment considers the potential effects of the Project on the socio-economic conditions within defined spatial and temporal boundaries. These boundaries will vary with the issues and socio-economic elements or interactions to be considered and will reflect:

- the socio-economic setting within the spatial boundaries of the Project;
- the construction, operation, maintenance and decommissioning and abandonment phases of the proposed physical works and physical activities;
- the time required for an effect to become evident;
- the time required for a population to recover from an effect and return to a pre-effect condition;

- the area directly affected by proposed physical works and physical activities; and
- the area in which a population functions and within which a Project effect may be felt.

The spatial boundaries consider one or more of the following areas, as summarized below and described in detail in Section 7.2. Figures showing the spatial boundaries used for each element are provided in Sections 5.0, 6.0 and 7.0 depending on the element in question.

- A **Footprint Study Area (Footprint)** consisting of the area directly disturbed by surveying, construction and clean-up of the pipeline and associated physical works and activities (including, where appropriate, the permanent right-of-way, pump stations, tanks, Westridge Marine Terminal, temporary construction workspace, temporary stockpile sites, temporary staging facilities, construction camps, access roads, power lines, etc).
- A **Local Study Area (LSA)** consisting of the zone of influence (ZOI) or area where the element and associated indicators are most likely to be affected by Project construction and operation. This generally represents a buffer from the centre of the proposed pipeline corridor. Detailed discussions regarding the element-specific LSAs and associated rationale are provided in Section 7.2.
- A **Regional Study Area (RSA)** consisting of the area extending beyond the LSA boundary where the direct and indirect influence of other activities could overlap with project-specific effects and cause cumulative effects on the indicator. For each element considered, a separate spatial RSA boundary was established in consideration of the regional effects of the Project on the individual element. Further rationale for the establishment of the RSAs is provided in Section 7.2.
- A **Provincial Area** that extends beyond regional or administrative boundaries, but is confined to Alberta and BC.
- A **National Area** that extends beyond Alberta and BC but is confined to Canada.
- An **International Area** that extends beyond Canada.

Reconnaissance, detailed field studies and desktop studies considered a proposed pipeline corridor approximately 150 m wide, encompassing the pipeline construction right-of-way, temporary workspace, pump stations, and related facilities. In the event that an area of interest was identified, field crews expanded their survey as appropriate (the survey was not expanded to an area greater than the LSA) to identify the extent and distribution of the area of interest, and to ensure that a comprehensive assessment of the feature(s) were being surveyed.

The time frames of the socio-economic assessment of the Project include the planning, construction (including reactivation/modification), operation, and decommissioning and abandonment phases. Pending regulatory approval, construction activities are expected to commence in Q1 2016 and extend to Q4 2017. The operation phase commences following completion of construction in Q4 2017 and extends for the useful life of the pipeline (approximately 50-70 years).

The socio-economic assessment also considers residual and cumulative effects that are likely to result from the Project in combination with existing activities and reasonably foreseeable developments that have been or will be carried out. In areas where environmental field crews were not able to get access for resource surveys, desktop studies, literature reviews, information derived from study of adjacent lands and professional judgment were relied on to make predictions. Possible effects and available mitigation measures are well known and can be relied on to make assessment predictions. Where necessary to confirm impact predictions and gather site-specific information, Trans Mountain will be conducting additional studies on those areas where access was not available. Where warranted, follow-up studies may be recommended.

1.3 Overview of Volume 5B

The socio-economic component of the ESA for the Project has been prepared under the guidance provided by the NEB *Filing Manual* and the requirements of the *CEA Act, 2012*. In addition, the mitigation measures, contingency and management plans provided in the project-specific Environmental Protection

Plans (EPPs) for the pipeline, facilities and Westridge Marine Terminal (Volumes 6B, 6C and 6D), the Socio-economic Management Plan (SEMP) (Volume 6B) and information on the Environmental Alignment Sheets (Volume 6E) will form the foundation for future socio-economic management activities by Trans Mountain, particularly during the construction phase of the Project. The biophysical component of the ESA for the Project is provided in Volume 5A. The environmental and socio-economic effects of increased Project-related marine vessel traffic are discussed in Volume 8A. Volume 5B is divided into the following sections.

1.0 **Introduction:** Provides the purpose of the socio-economic assessment, a description of the scope of the Project and the scope of the assessment, an outline of Volume 5B and a summary of the Project team.

2.0 **Project Description:** Provides a description of the Project components and Project phases related to the pipeline and facilities component of the Project.

3.0 **Public Consultation, Aboriginal Engagement and Landowner Relations:** Provides a summary of public involvement and Aboriginal engagement activities conducted in preparation of the ESA for the pipeline and facilities component of the Project. This section discusses the engagement with Aboriginal communities and consultation with landowners, federal, provincial and municipal regulatory authorities, and other interested parties such as environmental non-government organizations (ENGOs), where applicable. The section also identifies key socio-economic issues raised during the consultation and engagement program. The consultation conducted in preparation of this volume was designed to complement the Trans Mountain public consultation and engagement program, which is discussed in Volumes 3A, 3B and 3C.

4.0 **Corridor and Facility Site Selection:** Provides a detailed description of the proposed pipeline corridor selection processes and site selection process for pipeline facilities, pump stations and storage tanks.

5.0 **Socio-Economic Setting for the Pipeline:** Provides a description of the current socio-economic conditions present along the proposed pipeline corridor and reactivated pipeline segments.

6.0 **Socio-Economic Setting for Facilities:** Provides a description of the current socio-economic conditions present at pump stations, storage tank sites, the Westridge Marine Terminal and temporary facilities.

7.0 **Socio-Economic Effects Assessment:** Describes the effects assessment and identifies the potential socio-economic effects, mitigation and enhancement measures and potential residual effects, including an assessment of their significance for the following Project components: pipeline; temporary facilities; pump stations (including power lines); storage tanks; Westridge Marine Terminal; and reactivated pipeline segments.

8.0 **Cumulative Effects Assessment:** Provides a description of the Project's contribution to potential adverse cumulative effects as well as an assessment of their significance.

9.0 **Supplemental Studies:** Provides a description of the plans to carry out ongoing studies.

10.0 **Follow-Up:** Provides a description of any proposed follow-up programs.

11.0 **Conclusion:** Provides conclusions related to the significance of potential adverse residual socio-economic effects and cumulative effects associated with the pipeline and facilities components of the Project.

1.4 Project Team

The companies that assisted with the preparation of Volume 5B are listed in Table 1.4-1.

TABLE 1.4-1

PROJECT TEAM

Project Description Public Consultation, Aboriginal Engagement and Landowner Relations Corridor and Facility Site Selection	Trans Mountain
Managed forest areas and forest health and assessment	B.A. Blackwell & Associates Ltd.
Palaeontological overview	Steppe Consulting Inc. L.V. Hills
Socio-economic assessment (Social and Cultural Well-Being, Human Occupancy and Resource Use, Infrastructure and Services, Navigation and Navigation Safety, and Employment and Economy)	Vista Strategy Corp. TERA Environmental Consultants (TERA) Conference Board of Canada
Agricultural assessment	McTavish Resource & Management Consultants
Worker expenditure analysis	Decision Economics Consulting Group
Community health assessment	Habitat Health Impact Consulting Corp.
Human health risk assessment	Intrinsik Environmental Sciences Inc.
Historical Resources Impact Assessment (HRIA) (Alberta) Archaeological Impact Assessment (AIA) (BC) Traditional land and resource use (TLRU) evaluation and assessment Viewshed modelling analysis (VMA)	TERA

Supporting socio-economic technical reports are provided in Volume 5D. The technical reports provide discipline-specific background information, the methodology and results of field surveys and research conducted in support of the socio-economic assessment. These technical reports and previous surveys and studies provide an information base for the pipeline and facilities component of the Project. The authors of the supporting technical reports also participated in the identification of potential effects, the evaluation of significance of residual effects and the development of mitigation measures within their respective disciplines.

1.5 References

1.5.1 Literature Cited

National Energy Board. 2013a. Filing Manual. Inclusive of Release 2013-03 (August 2013). Calgary, AB.

National Energy Board. 2013b. List of Issues for the Trans Mountain Expansion Project. Website: http://www.neb-one.gc.ca/clf-nsi/rthnb/pplctnsbfrthnb/trnsmntnxpnsn/trnsmntnxpnsn-eng.html#s4. Accessed: August 2013.

National Energy Board. 2013c. Filing Requirements Related to the Potential Environmental and Socio Economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project.

1.5.2 GIS Data and Mapping References

Alberta Tourism, Parks and Recreation - Parks Division. 2012. Protected Areas (pashape_ocsites_10tm) (digital file). Edmonton, AB. Available: http://albertaparks.ca/albertaparksca/library/downloadable-data-sets.aspx. Acquired: February 2013. Last Update Check: May 14, 2013.

AltaLIS. 2010. Alberta Settlements (digital file). Calgary, AB. Available: http://www.altalis.com/prod_base_bound.html. Acquired: February 2011. Last Update Check: May 15, 2013.

AltaLIS. 2012. Alberta Provincial Parks (digital file). Calgary, AB. Available: http://www.altalis.com/prod_base_bound.html. Acquired: August 2012. Last Update Check: May 15, 2013.

AltaLIS. 2013. Alberta Municipal Boundaries (digital file). Calgary, AB. Available: http://www.altalis.com/prod_base_bound.html. Acquired: August 2012. Last Update Check: May 15, 2013.

British Columbia Forests, Lands and Natural Resource Operations. 2008. Freshwater Atlas Lakes (digital file). Victoria, BC. Available: https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: August 2011. Last Update Check: October 10, 2013.

British Columbia Forests, Lands and Natural Resource Operations. 2012. Digital Road Atlas (DRA) - Master Partially Attributed Road Data (digital file). Victoria, BC. Available: https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: December 2012. Last Update Check: December 17, 2012.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2008a. Tantalis Conservancy Areas (digital file). Victoria, BC. Available: https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: May 2013. Last Update Check: May 21, 2013.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2008b. Tantalis Parks, Ecological Reserves and Protected Areas (digital file). Victoria, BC. Available: https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: August 2013. Last Update Check: August 1, 2013.

ESRI. 2005. US State Boundaries (digital data). Redlands, CA. Available: http://www.esri.com/data/data-maps, data came with ArcGIS software. Acquired: September 2006. Last update check: N/A.

ESRI Inc. 2013. World Shaded Relief map service (digital file). Redlands, CA. Available: via ArcGIS Online, visit http://www.arcgis.com/home/item.html?id=9c5370d0b54f4de1b48a3792d7377ff2. Acquired: June 2013. Last Accessed: October 2013.

IHS Inc. 2004a. IHS Hydro Line Data (digital file). Calgary, AB. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: June 2011. Last Update Check: October 23, 2013.

IHS Inc. 2004b. IHS Hydro Region Data (digital file). Calgary, AB. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: June 2011. Last Update Check: October 23, 2013.

IHS Inc. 2010. IHS Provincial Boundaries (digital file). Calgary, AB. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: June 2011. Last Update Check: July 31, 2013.

IHS Inc. 2013a. IHS Cities and Towns (digital file). Calgary, AB. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: October 2013. Last Update Check: October 23, 2013.

IHS Inc. 2013b. IHS First Nations (digital file). Calgary, AB. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: October 2013. Last Update Check: October 23, 2013.

IHS Inc. 2013c. IHS Road Segments (digital file). Calgary, AB. Available: http://energy.ihs.com/Solutions/Regions/Canada/. Acquired: October 23, 2013. Update Interval: Monthly.

Government of Canada. 2013. Aboriginal Lands, Canada (digital file). Edmonton, AB. Available: http://www.geobase.ca. Acquired: November = 2013. Last Update Check: November 7, 2013.

Kinder Morgan Canada. 2012. Baseline Routing (digital file). Calgary, AB. Received via FTP. Acquired: May 9, 2012. Last Update Check: N/A.

Natural Resources Canada. 2003. Canadian Geographical Names (digital file). Ottawa, ON. Available: http://geobase.ca/geobase/en/data/cgn/index.html. Acquired: June 2013. Last Update Check: June 13, 2013.

Natural Resources Canada. 2010a. North American Atlas – Hydrography (digital file). Ottawa, ON. Available: http://geogratis.cgdi.gc.ca/geogratis/en/download/northamerica.html. Acquired: June 2012. Last Update Check: January 3, 2013.

Natural Resources Canada. 2010b. North American Atlas – Hydrography (digital file). Ottawa, ON. Available: http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/4a778c9f-00b1-5fce-aa2f-42a90d19eb24.html. Acquired: June 2012. Last Update Check: June 20, 2013.

Natural Resources Canada. 2012. CanVec -Transportation - 1020009 Railway (digital file). Sherbrooke, QC. Available: http://geogratis.cgdi.gc.ca/geogratis/en/download/topographic.html. Acquired: June 2012. Last Update Check: November 2012.

Natural Resources Canada. 2013a. Canada Lands Administrative Boundaries Level 1 (digital file). Ottawa, ON. Available: http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/eb3757cc-d08b-5e62-9a44-3a8534ff3249.html. Acquired: June 2013. Last Update Check: June 13, 2013.

Natural Resources Canada. 2013b. National Road Network – Alberta (digital file). Sherbrooke, QC. Available: http://www.geobase.ca/geobase/en/data/nrn/index.html. Acquired: June 2013. Last Update Check: September 6, 2013.

Natural Resources Canada. 2013c. National Road Network - British Columbia (digital file). Sherbrooke, QC. Available: http://www.geobase.ca/geobase/en/data/nrn/index.html. Acquired: September 2013. Last Update Check: September 6, 2013.

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

Universal Pegasus International. 2013. Rev 6 Routing (digital file). Calgary, AB. Received via FTP. Acquired: August 23, 2013. Last Update Check: N/A.

2.0 PROJECT DESCRIPTION

This section provides a description of the Project's components and summarizes activities associated with the construction, operation, and decommissioning and abandonment phases of the pipeline and associated facilities.

2.1 Project Components

The following subsections describe the components of the Project and locations of the proposed and reactivated pipeline segments, proposed activities at pump stations, temporary facilities, proposed storage tank facilities, and the expansion of the Westridge Marine Terminal. More detailed descriptions are provided in Volume 2. The existing TMPL system and proposed and reactivated segments, as well as pump stations and terminals, are shown in Figure 1.1-1 of Section 1.0.

To delineate features along the proposed pipeline corridor, Reference Kilometre (RK) posts approximately 1 km apart have been established based on the general centre of the proposed pipeline corridor. RK 0.0 is located at the Edmonton Terminal where the existing TMPL system starts. The end of the existing TMPL system is located at the Burnaby Terminal (RK 1179.8), where two approximately 3.6 km long (RK 0 to RK 3.6) delivery lines extend from the Burnaby Terminal to the Westridge Marine Terminal.

The ESA is based on preliminary engineering and designs. In general, conservative assumptions have been used. However, further technical development during the upcoming phases of engineering and detailed design in 2014 and 2015 will confirm the current assessment of socio-economic effects. If there are substantive changes from the preliminary designs, additional assessment and regulatory consultation may be required.

For the purposes of the socio-economic assessment, the proposed pipeline corridor is divided into six distinct socio-economic regions (Figures 5.0-1 to 5.0-7 of Section 5.0). Table 2.1-1 describes the six regions and the type of facilities to be constructed and operated in each.

TABLE 2.1-1

SOCIO-ECONOMIC REGIONS

Socio-Economic Region	Edmonton Region	Rural Alberta Region	Jasper National Park Region	Fraser-Fort George/ hompson-Nicola Region	Fraser Valley Region	Metro Vancouver Region
Region Boundaries	Strathcona County to western boundary of Parkland County	Eastern boundary of Yellowhead County to eastern boundary of Jasper National Park	Eastern and western boundaries of Jasper National Park	Western boundary of Jasper National Park (Alberta/BC border) to halfway between Merritt and Hope	Halfway between Merritt and Hope to the western boundary of the Fraser Valley Regional District (FVRD)	Boundaries of Metro Vancouver or the Greater Vancouver Regional District
Pipeline RK Range	RK 0.0 to RK 135.0	RK 135.0 to RK 339.4	No new pipeline (RK 339.4 to RK 489.6)	RK 489.6 to RK 991.1	RK 991.1 to RK 1137.4	RK 1137.4 to RK 1179.8 RK 0 to RK 3.6 (Burnaby Terminal to Westridge Marine Terminal)
New Pipeline Segment(s) in the Region	Edmonton to Hinton	Edmonton to Hinton	None	Hargreaves to Darfield; Black Pines to Hope	Black Pines to Hope; Hope to Burnaby	Hope to Burnaby; Burnaby to Westridge
Pipeline Reactivation Segments	None	Hinton to Hargreaves	Hinton to Hargreaves	Hinton to Hargreaves; Darfield to Black Pines	None	None
Pump Stations (bolded indicates Project activity)	Stony Plain **Gainford**	Chip **Niton** **Wolf**	**Jasper**	**Rearguard** Albreda Chappel	Hope Waleach **Sumas**	Port Kells

TABLE 2.1-1 Cont'd

Socio-Economic Region	Edmonton Region	Rural Alberta Region	Jasper National Park Region	Fraser-Fort George/ Thompson-Nicola Region	Fraser Valley Region	Metro Vancouver Region
Pump Stations (cont'd) (bolded indicates Project activity)	See above	Edson Hinton	See above	**Blue River** Finn McMurphy **Blackpool** **Darfield** **Black Pines (new site)** **Kamloops** Stump **Kingsvale**	See above	See above
Terminals (bolded indicates Project activity)	Edmonton Terminal	None	None	Kamloops Terminal	Sumas Terminal	Burnaby Terminal Westridge Marine Terminal

2.1.1 Pipeline

2.1.1.1 New Pipeline

The Edmonton Region extends from the existing Edmonton Terminal at SW 5-53-23 W4M (RK 0.0) in Strathcona County to the western boundary of Parkland County at NW 17/SW 20-53-7 W5M (RK 135.0). The total length of new pipeline in the Edmonton Region is 135 km.

The Rural Alberta Region extends from the western boundary of Parkland County at NW 17/SW 20-53-7 W5M (RK 135.0) to the boundary of Jasper National Park at NE 15-49-27 W5M. The total length of proposed pipeline in the Rural Alberta Region is 204.4 km, extending from the boundary of Parkland County at NW 17/SW 20-53-7 W5M (RK 135.0) to the existing TMPL at the Hinton Pump Station at NW 33-49-26 W5M (RK 339.4). The existing deactivated pipeline segment from Hinton Pump Station to Jasper National Park will be reactivated (refer to Section 2.1.1.2).

The Fraser-Fort George/Thompson-Nicola Region extends from Mount Robson Provincial Park at the Alberta/BC border at SE 23-45-4 W6M to the boundary of the FVRD at 71-H/92-H-11 (RK 991.1). The total length of new pipeline in the Fraser-Fort George/Thompson-Nicola Region is 458.7 km, extending from a tie-in at Hargreaves at 20-B/083-E-3 (RK 489.6) to Darfield at 75-B/092-P-8 (RK 769) and from Black Pines at 41-K/092-I-16 (RK 811.8) to the boundary of the FVRD at 71-H/92-H-11 (RK 991.1). Existing deactivated pipeline segments will be reactivated where no new pipeline is proposed as part of the Project (refer to Section 2.1.1.2).

The Fraser Valley Region extends from the boundary of the FVRD at 71-H/92-H-11 (RK 991.1) to the boundary of the City of Abbotsford and Township of Langley at 57-E/92-G-1 (RK 1137.4). The total length of new pipeline in the Fraser Valley Region is 146.3 km.

The Metro Vancouver Region extends from the boundary of the City of Abbotsford and Township of Langley at 57-E/92-G-1 (RK 1137.4) to the Burnaby Terminal at 25-D/092-G-7 (RK 1179.8), also encompassing the Westridge delivery lines extending from the Burnaby Terminal at 25-D/092-G-7 (RK 0) to the Westridge Marine Terminal at 46-D/092-G-7 (RK 3.6). The total length of new pipeline in the Metro Vancouver Region is 46 km.

The proposed route of the new pipeline in the five socio-economic regions is identified along an approximately 150 m wide corridor. Although the proposed pipeline will generally require a construction right-of-way of 45 m, the corridor width varies along the route depending on the types of land use and potential engineering and environmental constraints.

The proposed pipeline corridor will parallel the existing TMPL system right-of-way to the greatest extent feasible considering, among other factors, present land uses and terrain adjacent to the existing TMPL system right-of-way. To reduce the area of new disturbance, the proposed pipeline corridor will parallel

other existing linear disturbances where feasible. For the purposes of this ESA, existing linear disturbance include electrical transmission lines, oil and gas pipelines, fibre optic lines, railways, highways and permanent roads.

A summary of technical details for the proposed pipeline corridor is provided in Table 2.1-2. Technical details specific to reactivated segments are provided in the following subsection. An overview map of the existing TMPL system and the proposed pipeline corridor is provided in Section 1.0. Additional information pertaining to the alignment of the proposed pipeline corridor and the location and rationale of route deviations is provided in Section 4.0 and Volume 2.

TABLE 2.1-2

TECHNICAL DETAILS – PROPOSED PIPELINE CORRIDOR

Total Length (including Westridge delivery lines):	Approximately 990.5 km
Length Parallel to Existing TMPL:	661.6 km (66.8%)
Length Deviating from Existing TMPL:	328.9 km (33.2%)
Total Length Parallel to Other Existing Linear Features:	221.2 km (22.3%)
Total Length Deviating from Other Existing Linear Features:	107.8 km (10.9%)
Product:	Heavy synthetic crude oil and diluted bitumen (also capable of transporting light crude oil and light synthetic oil, if necessary)
Source Point:	Existing Edmonton Terminal at SW 5-53-23 W4M (RK 0.0)
Delivery Point:	Existing Sumas Terminal at a-097-B/092-G-01 (RK 1117.5), existing Burnaby Terminal at a-025-D/092-G-07 (RK 1179.8) and existing Westridge Marine Terminal at 46-D/092-G-7 (RK 0.0 [Burnaby Terminal] to RK 3.6)
Pipe Size:	One 914.4 mm OD (NPS 36) pipeline from Edmonton Terminal to Burnaby Terminal and two 762 mm OD (NPS 30) Westridge delivery lines from Burnaby Terminal to Westridge Marine Terminal
Construction Footprint (typical) (construction right-of-way):	The construction right-of-way will typically be 45 m wide, including an approximately 18 m wide permanent easement. The remainder of the construction right-of-way width will be used as temporary workspace.
Construction Footprint (atypical) (construction right-of-way):	The construction right-of-way will be narrowed to 10 m or less where specific constraints or limitations are identified, such as parks and sensitive areas, confined valleys, urban areas, adjacent infrastructure or land features and when in proximity to the existing TMPL right-of-way.
Temporary Workspace:	Additional temporary workspace will be necessary at select locations to accommodate construction activities (*e.g.*, road, rail, buried utility line and water crossings, sharp sidebends, tie-ins, and locations where extra depth of cover, deep topsoil, three-lift handling or heavy grading is necessary). Trans Mountain will also acquire temporary workspace for Project construction needs such as stockpile sites, equipment storage sites, shoo-flies, contractor staging areas, borrow pits and construction work camps (refer to Section 2.1.2 for additional information).
Trench Depth	1.8-2.1 m, deeper at watercourses
Minimum Depth of Cover:	0.9 m (0.6 m in bedrock)
Typical Trench Width:	Approximately 2 m
Test Medium:	Water
New Above Ground Line Facilities:	Includes approximately 86 automated mainline block valves (MLBVs), scraper traps and a pressure control station (pending results of detailed hydraulic studies). Refer to Section 2.1.1.3 for a description of automated MLBVs and the pressure control station, and Sections 2.1.3 to 2.1.5 for information on scraper trap facilities at pump stations, storage terminals and the Westridge Marine Terminal, respectively.

2.1.1.2 Reactivated Pipeline Segments

The reactivated pipeline segments from Hinton to Hargreaves and Darfield to Black Pines generally parallel the existing TMPL right-of-way. The existing TMPL easement through Jasper National Park and Mount Robson Provincial Park is 6.1 m wide and 18 m wide, respectively. Outside the parks, the existing easement along the two segments is generally 18 m wide. Permanent surface disturbance along the reactivated segments will be limited to locations where automated MLBVs will be installed or where existing valves will be automated. Temporary surface disturbance will be limited to preparation for in-line inspection, defect repair and hydrostatic testing.

2.1.1.3 Pipeline Associated Permanent Facilities

Approximately 86 automated MLBVs will be installed along the pipeline for emergency shutdown and isolation of pipeline segments. Automated MLBVs will be constructed within the operating pipeline right-of-way and most will be sited adjacent to existing TMPL valves. Many automated MLBVs will be accessed by existing access roads, however, permanent access roads may be required at yet unspecified locations. Automated MLBVs will require a permanent power source. Typically, new power lines will only be used when there is a source nearby, thereby reducing any additional disturbance. Otherwise, alternative power sources such as solar panels, battery banks and/or nitrogen bottles will be used. Each automated MLBV installation will require a fenced and gravelled operating area of approximately 5 m x 12 m (60 m^2). The exact location of automated MLBVs and power sources utilized will be determined during the detailed engineering and design phase.

Pending results of detailed hydraulic studies, a pressure control station may be required for TMEP at the Hope Pump Station. The purpose of the station, if required, will be to control pressure in the pipeline to ensure product flows at a relatively steady rate as it leaves Kingsvale Pump Station (high elevation) and flows down slope toward the Lower Mainland (low elevation). The station will utilize the existing electrical distribution line and access road to the Hope Pump Station. No new lands will be required.

2.1.2 Pipeline Associated Temporary Facilities

Temporary Access Roads and Shoo-flies

Existing infrastructure will be used where practical for access during construction. Access to the new pipeline construction right-of-way, where it is not contiguous with the existing pipeline alignment, will be from existing public and private access points and roads (respecting traffic safety and concern for other users), controlled existing access, rights-of-way of others (*e.g.*, Canadian National Railway Company [CN], Telus, Spectra), and existing shoo-flies and trails. Only approved access will be used.

Where existing access is not sufficient or available, access might be improved along existing trails as necessary during construction by widening, re-grading or other means. Former access trails may also be reactivated and existing rights-of-way of others may be used to reduce disturbance.

Where new temporary access is required, all applicable authorizations and approvals will be sought on private and public lands, including parks and protected areas. Temporary access roads and shoo-flies will typically be 5 m wide to accommodate equipment and machinery.

Temporary Facility Sites

In addition to the pipeline easement and associated temporary workspace, land will be required for temporary sites, including:

- staging and stockpile sites;
- equipment storage sites;
- construction office sites;
- construction work camps (likely one in Alberta and two in BC);
- trenchless crossing work areas;
- borrow pits; and
- log decks.

Wherever practical, these temporary facilities will be located within previously disturbed areas to minimize overall Project disturbance. All temporary facility sites will be reviewed from an environmental perspective before their use.

Sewage and grey water will be treated in a temporary treatment facility on-site at each facility and hauled to regional facilities for disposal. Power will be supplied by generators and by the local electrical grid, where available.

If permitted, potable water at the facilities will be drawn from adjacent sources such as the Athabasca, Fraser, North Thompson, Coldwater and Coquihalla rivers, at rates acceptable to the appropriate regulatory authorities and filtered before use. Otherwise, potable water will be trucked in to each work camp site.

2.1.3 Pump Station Facilities

Pump stations are positioned along the existing TMPL system at 23 locations to maintain pressure and move the product along the line and monitor flow. To accommodate the expansion, the Project will include construction and operation of new pump stations serving the new pipeline at 10 of the existing pump station sites at Edmonton, Gainford, Wolf, Edson and Hinton in Alberta, and at Rearguard, Blue River, Blackpool, Kamloops and Kingsvale in BC. Two new pump stations will also be constructed and operated at a new greenfield site at Black Pines, BC to serve both the existing pipeline and new pipeline.

Pump stations are generally located within a fenced area on approximately 4 ha of land and contain the following: pumps and motors housed in a building; an electrical service building; an operator building; an electrical substation; and station piping and valves. Pump stations will be connected to the provincial power grid via new or existing power lines. Trans Mountain or a third party (*e.g.*, AltaLink Management Ltd., BC Hydro and Power Authority [BC Hydro]) will apply to the appropriate provincial regulatory authorities for electrical facilities necessary to connect with the provincial power lines. Existing access will be utilized for all pump stations with the exception of Black Pines, which will require construction of a permanent 5 m wide gravelled access road approximately 25 m in length, subject to final site selection and detailed engineering and design.

There will be one new 2,500 HP pumping unit installed on the NPS 24 pipeline heading south along the Puget Sound line from the Sumas Pump Station into Washington State. The existing Jasper Pump Station in Alberta will be relocated from the TMX Anchor Loop pipeline to serve TMPL system (currently deactivated). Valves, controls and other instruments will also be installed as part of the pump station modifications.

As an outcome of the TMEP, the Niton Pump Station will be reactivated (currently deactivated) to serve the existing pipeline and the existing pump stations at Wolf and Blue River will be deactivated since they will no longer be required for the existing TMPL system. The infrastructure that is currently in place at the deactivated pump stations will remain on-site should there be the need to reactivate either of the stations at some point in the future. The existing electrical service building and variable frequency drive building will, however, serve the new pump stations at Wolf and Blue River. The deactivated stations will be disconnected from the existing TMPL system and purged with nitrogen. All associated reactivation and deactivation activities will be conducted within the current fenced areas and no new disturbance will be required.

Although no changes to pumping capacity are anticipated at the Darfield Pump Station, valve modifications and installation of a new scraper trap (sending and receiving) are planned.

No work is planned at the following pump stations: Stony Plain and Chip, Alberta; and Albreda, Chappel, Finn, McMurphy, Stump, Hope, Wahleach and Port Kells, BC.

A summary of the location, components, present land use, land requirements and ancillary facilities (including scraper traps) at each pump station is provided in Table 2.1-3. Pump station schematics are provided in Volume 4A.

TABLE 2.1-3

TECHNICAL DETAILS – PUMP STATION ACTIVITIES

Pump Station and Location	Activities	Land Use and Land Requirements	Nearest Residence/ Receptor from Facility Fence Line
Edmonton • RK 0.0 • SW 5-53-23 W4M	• new pump station[1] consisting of four electrically driven 5,000 HP pumps plus one spare[2] added to serve TMEP • new scraper facilities (sending) on TMEP • a new substation • a new power line (to be determined by provincial regulatory authority)[3] • fencing	industrial/within existing Trans Mountain-owned lands	• 1.9 km northwest and southeast
Gainford • RK 117.5 • NE 13-53-6 W5M	• new pump station[1] consisting of three electrically driven 5,000 HP pumps to serve TMEP • upgrades to existing substation • fencing	industrial and forested (clearing required)/within existing Trans Mountain-owned lands	• 140 m east
Niton • RK 191.4 • SW 34-53-13 W5M	• reactivate two existing 2,000 HP pumps to serve TMPL	industrial/within existing Trans Mountain-owned lands	• 1 km southwest
Wolf • RK 206.2 • NW 19-53-14 W5M	• new pump station[1] consisting of two electrically driven 5,000 HP pumps serving TMEP • existing pump building will be deactivated • fencing	industrial/within existing Trans Mountain-owned lands	• 600 m west-southwest
Edson • RK 247.1 • SW 18-53-18 W5M	• new pump station[1] consisting of three electrically driven 5,000 HP pumps serving TMEP • new scraper facilities (sending and receiving) on TMEP • replace existing substation • a new power line (to be determined by provincial regulatory authority)[3] • fencing and on-site gravel road	industrial/within existing Trans Mountain-owned lands	• 360 m west
Hinton • RK 339.4 • NW 33-49-26 W5M	• new pump station[1] consisting of three electrically driven 5,000 HP pumps serving TMEP • new scraper facilities (sending) on TMPL • fencing	industrial/will require acquisition of approximately 0.32 ha (35 m x 90 m) new land outside existing Trans Mountain-owned lands to the west	• 820 m southwest
Jasper • NW 2-46-1 W6M	• relocate two existing 2,500 HP pumps from the TMX Anchor Loop pipeline to TMPL (currently deactivated) • drag resistant agent injection facility requiring small storage tank (with secondary containment) and a high pressure injection pump	industrial/within Crown lands currently leased by Trans Mountain	• 1.3 km southeast
Rearguard • RK 498.3 • d-068-K/083-D-14	• new pump station[1] consisting of two electrically driven 5,000 HP pumps serving TMEP • remove scraper facilities (sending and receiving) from Hargreaves • new scraper facilities (sending and receiving) on TMPL and TMEP • fencing and on-site gravel road	industrial and disturbed forested (clearing required)/will require acquisition of approximately 0.7 ha (70 m x 100 m) new land outside existing Trans Mountain-owned lands to the east	• none within 2 km

TABLE 2.1-3 Cont'd

Pump Station and Location	Activities	Land Use and Land Requirements	Nearest Residence/ Receptor from Facility Fence Line
Blue River • RK 614.7 • a-035-F/083-D-03	• new pump station[1] consisting of three electrically driven 5,000 HP pumps serving TMEP • existing pump building will be deactivated	industrial/within existing Trans Mountain-owned lands	• 30 m east and south
Blackpool • RK 736.8 • c-073-B/092-P-09	• new pump station[1] consisting of three electrically driven 5,000 HP pumps serving TMEP • upgrade existing transformer • fencing and on-site gravel road	industrial/within existing Trans Mountain-owned lands	• 150 m north-northwest
Darfield • RK 769 • d-075-B/092-P-08	• new scraper facilities (receiving) on TMEP • fencing	industrial and agricultural/will require acquisition of approximately 0.07 ha (23 m x 30 m) new land outside existing Trans Mountain-owned lands extending from the northwest corner of the property line	• 150 m south
Black Pines • RK 811.8 • d-041-K/092-I-16	• new pump station[1] consisting of two electrically driven 5,000 HP pumps serving TMEP • new pump station[1] consisting of two electrically driven 2,500 HP pumps serving TMPL • new substation to serve both lines • new scraper facilities (sending and receiving) on TMPL and TMEP • new access road approximately 5 m x 25 m[3] • new 138 kV power line approximately 50 m x 2.2 km[3] • fencing and on-site gravel road	forested (clearing required)/requires acquisition of approximately 150 m x 150 m (2.3 ha) of privately-owned land	• 600 m south
Kamloops • RK 850.8 • d-094-E/092-I-09	• new pump station[1] consisting of three electrically driven 5,000 HP pumps plus one spare[2] added to TMEP • new substation to serve TMEP • new scraper facilities (sending and receiving) on TMEP	industrial with grading required/within existing Trans Mountain-owned lands	• 520 m southeast
Kingsvale • RK 955.6 • b-023-L/092-H-15	• new pump station[1] consisting of two electrically driven 5,000 HP pumps serving TMEP • replace existing substation • new 138 kV power line approximately 50 m by 23.5 km[3] • fencing	forested (clearing and grading required)/within existing Trans Mountain-owned lands	• 300 m southwest
Sumas • RK 1113.8 • c-073-B/092-G-01	• one electrically driven 2,500 HP pump serving the Puget Sound line • upgrade existing substation	industrial/within existing Trans Mountain-owned lands	• 110 m southwest

Notes: 1 New pump stations require the installation of an electrical service building, pump building and operator building, as well as motors, instrumentation, station piping and valves. Existing electrical service buildings and operator buildings will be used where possible.

2 Spare pumps will remain inactive during normal operations.

3 Power line routing and the new access road will be confirmed during the detailed engineering and design phase.

2.1.4 Tank Facilities

To serve the expanded pipeline, a total of 20 new storage tanks will be constructed: 5 at the Edmonton Terminal; 1 at the Sumas Terminal; and 14 at the Burnaby Terminal. The new welded steel tanks will be similar in structure to the existing tanks at the terminals and installed on stable, engineered foundations within a bermed containment area.

After the site has been rough graded, foundations for each tank will be constructed. Foundation design parameters may vary across terminals based on the results of detailed geotechnical surveys. Leak-detection systems consisting of a passive-weeping channel between the liner and tank floor will be installed. An internal tank liner, covering the bottom and about 1 m up the shell, will be provided for corrosion prevention. Cathodic protection will be installed on all new tanks as an added measure to protect against corrosion. Tank control systems will include a radar gauging system for high and low level monitoring and overfill protection. Redundant instrumentation for overfill protection will be provided.

All tanks will have secondary containment consisting of compacted clay or a geosynthetic liner. Secondary containment will be capable of containing 100% of the working volume of the largest tank plus 10% of the working volume of other tanks that share a common impoundment. The bermed area will be graded to direct all surface water to a runoff containment area, where it can be inspected before release. Surface runoff within these containment areas will be released through manually controlled valves following water quality monitoring. Drainage features will be designed and installed to ensure that no runoff originating off-site will be allowed to enter the proposed development area.

Additional components include valves, metering and provers, pumps and inter-connecting pipes. The existing fire-protection system and stormwater management system will be expanded to accommodate the additional tanks at each site. Final details will be determined during the detailed engineering and design phase.

A summary of technical details associated with the proposed storage tanks at the Edmonton, Sumas and Burnaby terminals is provided in Table 2.1-4. Terminal schematics are provided in Volume 4A.

TABLE 2.1-4

TECHNICAL DETAILS – STORAGE TANKS AND ASSOCIATED FACILITIES AT THE EDMONTON, SUMAS AND BURNABY TERMINALS

Technical Details	Edmonton Terminal	Sumas Terminal	Burnaby Terminal
Location	• RK 0 • SW 5-53-23 W4M	• RK 1117.5 • a-097-B/092-G-01	• RK 1179.8 • a-025-D/092-G-07
Nearest Residence/Receptor from Facility Fence Line	• 1.9 km northwest and southeast	• 60 m south	• approximately 50 m south
Product	Diluted bitumen, synthetic bitumen, diluted synthetic bitumen, light crude and synthetic crude		
Existing Storage Tank Capacity	• 19 tanks with an approximate capacity of 429,270 m^3 (2.7 million bbl)[1]	• 6 storage tanks with an approximate capacity of 113,680 m^3 (715,000 bbl)	• 13 tanks with an approximate capacity of 270, 280 m^3 (1.7 million bbl)
New Storage Tank Capacity	• 2 x 34,980 m^3 (220,000 bbl) • 2 x 63,600 m^3 (400,000 bbl) • 1 x 11,920 m^3 (75,000 bbl)	• 1 x 27,820 m^3 (175,000 bbl)	• 2 x 39,750 m^3 (250,000 bbl) • 10 x 45,310 m^3 (285,000 bbl) • 2 x 53,260 m^3 (335,000 bbl)
Maximum Tank Height	21.3 m	17.1 m	18.3 m
Roof Type	external floating roof	fixed steel roof with internal floating roof	
Overall Site Area	47.2 ha	43.3 ha (only 11.6 ha currently disturbed)	76.7 ha
Total Containment Capacity	will allow for containment of 100% of the working volume of the largest tank plus 10% of the working volume of other tanks that share a common impoundment and stormwater		
Runoff Containment Area Size/Capacity	1-in-100-year storm event with a 24 hour duration period		
Pump Sizes	Seven 800 HP booster pumps (electric drive)	None	Eight 500 HP booster pumps (electric drive)
Test Water Source	from existing storage ponds filled with water diverted from nearby creeks (subject to existing or future permit approval conditions) and/or purchased from the municipal water supply		
Land Requirements	within existing Trans Mountain fence line on previously disturbed industrial lands	within the existing Trans Mountain property boundary, however, existing fence line will be moved approximately 20 m north (20 m x 350 m [0.7 ha] of new disturbance) to accommodate a new access road and earthworks for modifications to the tank secondary containment berm	within existing Trans Mountain fence line on previously disturbed industrial lands, however, disturbance to natural watercourses within the existing site boundaries will result in the loss of riparian vegetation as well as a change in natural surface flow patterns

TABLE 2.1-4 Cont'd

Technical Details	Edmonton Terminal	Sumas Terminal	Burnaby Terminal
Associated Infrastructure	on-site access roads to each new tank, power requirements/upgrades	on-site access road to the new tank, power requirements/upgrades are not required due to small increase in load at this facility	on-site access roads to each new tank and other associated facilities, power requirements/upgrades will be determined by BC Hydro (anticipated that approximately 5 MW of additional power will be required)
Other Activities	an existing 12,720 m^3 (80,000 bbl) tank will be dismantled and replaced by the new 11,920 m^3 (75,000 bbl) tank	to make space available for the new tank, a power line will be relocated approximately 20 m to the north and an existing containment berm will be dismantled and the area graded to support the foundation for the new tank. A new containment berm will be constructed before the new tank is put into operation	new scraper facilities for new pipeline (receiving) and Westridge delivery lines (sending), and an existing 12,720 m^3 (80,000 bbl) tank will be dismantled and replaced by one of the 45,310 m^3 (285,000 bbl) tanks

Note: 1 Trans Mountain is currently in the process of constructing the Edmonton Terminal Expansion Project, which involves constructing 10 new tanks and associated facilities at the Edmonton Terminal. This project was approved by the National Energy Board (NEB) in March 2008 and is now being constructed under Amending Order AO-005-XO-T246-04-2008. In February 2013, Trans Mountain applied to the NEB to vary Amending Order AO-005-XO-T246-04-2008 to permit construction of four additional tanks at the Edmonton Terminal for a total of 14 tanks. The NEB issued an Amending Order AO-006-XO-T246-04-2008 on June 20, 2013 and the four additional tanks are expected to come into service by late 2014. Furthermore, in July 2013 Trans Mountain applied to the NEB (File OF-Fac-Oil-T260-2013-04 01) to construct an additional two tanks at the Edmonton Terminal. Pending regulatory approval, the two tanks are expected to come into service by late 2014 or early 2015.

2.1.5 Westridge Marine Terminal

The Westridge Marine Terminal is located on the south shore of Burrard Inlet east of the Second Narrows at RK 3.6 (d-047-D/092-G-07) of the Westridge delivery lines. Preliminary design of the additional facilities at the Westridge Marine Terminal is currently underway. These plans include constructing the following dock facilities:

- one dock with three operational berths for Aframax tankers, with one of the three new berths equipped to accommodate oil and jet fuel barges; and
- one small utility dock with multiple berths for pilot launches, tugs, spill response vessels and equipment.

The proposed configuration of the new docks is provided in Volume 4A. Some near shore dredging might be necessary to accommodate construction of the new docks.

Each of the three tanker berths consists of a number of individual elements or structures arranged in accordance with accepted industry practice. Typical elements include:

- fender and mooring structures;
- vessel access towers;
- delivery and receipt pipeline systems, including loading arms;
- pedestrian catwalks connecting the dolphin structures to the central platform; and
- vapour recovery systems and fire-suppression systems.

The existing water lease will need to be expanded to accommodate the new docks. Foreshore lands will also be expanded along the lateral footprint to provide the necessary space for shore equipment and structures. The outer face of the fill will be protected with rip rap (stone armour) to prevent erosion.

New scraper receiving facilities will be installed for the two new Westridge delivery lines between the Burnaby Terminal and the Westridge Marine Terminal. The new scraper receiving facilities will be

installed within the existing fence line of the Westridge Marine Terminal on previously disturbed lands owned by Trans Mountain.

The existing electrical substation and electricity supply line within the Westridge Marine Terminal will be upgraded as required. Electrical upgrades will be determined through a study to be conducted by BC Hydro. At this time, it is anticipated that an additional 3 MW of power will be required at this facility. No new roads will be required to access the terminal. However, an improved site access road and an expanded parking area for staff and contractors will be required. No new access will be constructed across the existing Canadian Pacific Rail line that bisects the facility.

The nearest residence is located approximately 75 m south of the Westridge Marine Terminal property boundaries.

2.2 Project Execution

This subsection describes the activities to be conducted as part of construction of the Project, including: construction of the new pipeline segments and associated permanent and temporary facilities; pipeline reactivation; pump station construction, expansion, reconfiguration, reactivation and deactivation; storage tank construction; and expansion of the Westridge Marine Terminal. It also describes the construction schedule and estimated workforce.

2.2.1 Construction Activities

Standard activities and equipment requirements for construction and other activities associated with the Project are described in Table 2.2-1. These activities are presented in their general order of occurrence. All of these activities are considered in the socio-economic effects assessment (see Section 7.0). For detailed descriptions of Project activities refer to Volume 4B.

TABLE 2.2-1

PROJECT ACTIVITIES

Construction Phase	Associated Activities
Engineering	All Project components will be designed and constructed in accordance with all applicable Canadian Standards Association (CSA) standards, the *National Energy Board Onshore Pipeline Regulations* (*NEB OPR*) and additional requirements described in Volume 4A.
New Pipeline Segments	
Construction Survey	Activities include line-of-sight clearing with chain saws (where needed), flagging and staking of the boundaries of the construction right-of-way and temporary workspace, as well as marking the trench line and existing utilities. Avoidance areas, such as protected habitats or rare plants, will also be appropriately fenced or flagged.
Clearing	Vegetation (trees, stumps, brush, grasses, crops and other vegetation) and snow will be cleared or mowed from the construction right-of-way and temporary workspace. Equipment used during clearing activities may include chainsaws, rotary grinders, feller-bunchers, hydro-axes or other tree-clearing and brushing equipment, as well as skidders, bulldozers and excavators. A stump mulcher will be utilized rather than grubbing on areas where topsoil or root zone material salvage and grading is not necessary.
Disposal	Timber and brush disposal options will be subject to agreements with occupants and the Crown. Merchantable timber will be salvaged as determined in the Timber Salvage Plan (Pipeline EPP [Volume 6B]). Residual woody materials will be disposed of by burning or chipping, unless otherwise directed by the Lead Environmental Inspector, Inspector(s) or the appropriate regulatory authority (*e.g.*, Alberta Environment and Sustainable Resource Development [AESRD], BC Ministry of Forests, Lands and Natural Resource Operations and/or British Columbia Ministry of Environment [BC MOE]). In the Lower Mainland where air quality is an issue and along highways where smoke may be a hazard, residual woody materials will be mulched in place or hauled to an approved disposal location.
Topsoil or Root Zone Material Salvage	In general, topsoil will be salvaged to ensure that the soil productivity is maintained in agricultural and grassland areas and root zone material will be salvaged where grading is necessary on treed lands. The width and depth of topsoil or root zone material salvage depends on a number of factors including the land use, soil conditions, microtopography, landowner and regulatory authority requests, and grading requirements. Equipment used during topsoil or root zone material handling activities may include bulldozers, graders and excavators.
Grading	Following topsoil or root zone material salvage, grading will be conducted on irregular ground surfaces (including temporary workspace) to provide a safe work surface. Graders, excavators and bulldozers will be used for this activity. Ripping or blasting might be required where hard bedrock is encountered.

TABLE 2.2-1 Cont'd

Construction Phase	Associated Activities
Stringing and Welding	The pipe will be transported by truck from stockpile sites to the construction right-of-way. The pipe will be bent, lined-up, welded, joint-coated and inspected, before being lowered into the trench. Is it anticipated that a mix of manual and mechanized welding will be used depending on terrain and anticipated productivity. Other equipment used during stringing and welding activities includes pipe trucks, booms, pick-up trucks, excavators and x-ray or ultrasonic inspection equipment mounted on pick-up trucks or skids.
Trenching	The trench will be excavated using tracked excavators to a depth sufficient to ensure the depth of cover is in accordance or in excess of applicable codes. The minimum depth of cover for the pipeline will generally be 0.9 m (the pipeline trench will be deeper at watercourse crossings, highway crossings etc.). Railway crossings and paved road crossings will generally be bored.
Lowering-In	The pipe will be lowered into the trench using sideboom tractors and excavators. Trench dewatering might be necessary at certain locations during lowering-in (*e.g.*, to ensure acceptable bedding for pipe, to prevent the pipe from floating or for performing tie-in welds).
Backfilling	Before backfilling, subsurface erosion-control structures such as trench breakers will be installed on steep slopes or long continuous slopes, along with subdrains, where warranted, to control subsurface drainage along the trench. The trench will be backfilled using excavators, graders, bulldozers or specialized backfilling equipment. Backfill material will generally consist of native-trench spoil material. Displaced subsoil will be crowned over the trench to compensate for settlement and any excess trench spoil will be feathered-out over adjacent portions of the construction right-of-way where topsoil or root zone material salvage has occurred. Padding may be necessary where the trench is created in areas of bedrock.
Testing	The pipeline segments will be hydrostatically pressure-tested in accordance with the *NEB OPR*, provincial legislation, codes of practice and guidelines as well as the latest version of CSA Z662. The pipeline will be pressure-tested in sequential segments, using water. Source water is likely to be drawn from the North Saskatchewan, Pembina and McLeod rivers for new pipeline in Alberta, and from the Fraser, Canoe, North Thompson, Thompson, Coldwater, Coquihalla and Sumas rivers for new pipeline in BC. Test water will be withdrawn and released in accordance with Alberta Codes of Practice (*i.e.*, Code of Practice for the Temporary Diversion of Water for Hydrostatic Testing of Pipelines and Code of Practice for the Release of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Gas Pipelines)and BC *Water Act* approval conditions. Upon completion, test water will be returned to its source basin. A detailed hydrostatic test plan will be developed and reviewed before the start of the hydrostatic pressure testing program.
Clean-Up and Reclamation	Initial clean-up and reclamation activities along disturbed portions of the construction right-of-way and temporary access trails (shoo-flies) will be initiated following backfilling, once weather and soil conditions permit. Debris remaining following construction will be removed and disposed of in compliance with local regulations. The construction right-of-way will be graded to restore pre-construction contours, where practical, and returned to a stable condition. The topsoil or root zone material will be replaced, with cross ditches and diversion berms installed on moderate and steep slopes to reduce the risk of erosion. On treed lands where erosion is not expected, natural revegetation will be the preferred method of reclamation. Non-cultivated agricultural and native grassland areas will be seeded with an appropriate seed mix unless otherwise directed by landowners or provincial or local authorities.
Watercourse Crossings	Options available for crossing watercourses include trenched (*e.g.*, isolation [dam and pump, flume] and open cut) and trenchless (horizontal directional drill [HDD] and bore) methods. The crossing method chosen will be based on the width, streamflow, channel morphology, subsurface geology, sensitivity and approach slopes. Additional information is provided in the Pipeline EPP (Volume 6B) and the fisheries technical reports (Volume 5C).
Permanent Pipeline Facilities	
Site Preparation	Sites located within the proposed easement will be prepared as part of the pipeline construction activities above. Sites located along the existing active or reactivated easements will involve clearing of snow and/or vegetation where present, salvaging of topsoil or root zone material and grading of the site, where warranted, using equipment similar to that described for construction of the pipeline.
Facility Construction	Once the infrastructure has been installed along the new pipeline or existing pipeline rights-of-way, the area inside the new fence line will be gravelled. The Pressure Control Station, if required, will be constructed entirely within the existing pump station boundary at Hope. Permanent pipeline-related facilities will be constructed as an integrated part of the pipeline construction. Permanent facilities work along the existing active and proposed reactivated segments will require surface disturbance confined to the existing right-of-way easement.
Potential Ancillary Infrastructure	Permanent Access Roads Activities associated with construction of new permanent access roads to the MLBVs (in the event any are required) and the Black Pines Pump Station include: surveying; clearing; salvaging and storing of topsoil or root zone material; grading; installing culverts at the road bar ditches; and clean-up and reclamation. Equipment used during access road construction includes bulldozers and graders. Distribution Power Lines Activities associated with the installation of distribution power lines to the MLBVs (in the event any are required) and the Pressure Control Station, if required, as well as the power lines at Black Pines and Kingsvale pump stations, include: surveying; clearing or mowing of brush; salvaging of topsoil or root zone material; drilling of holes; erecting poles; stringing of new cable; replacing topsoil or root zone material; and clean-up and reclamation. Equipment used to install distribution lines includes backhoes, bulldozers and drill equipment for the poles.
Reactivated Segments	
Pipeline Inspection, Repairs and Cleaning	Before testing, reactivated pipeline segments will be assessed using in-line inspection tools. Specific locations along the pipeline will be physically inspected and repaired, if required, as determined necessary to ensure integrity. Following inspection, in-line cleaning tools will be used to scrub the pipe walls and remove residual hydrocarbon products and debris.

TABLE 2.2-1 Cont'd

Construction Phase	Associated Activities
Testing	Following inspection and cleaning, the pipeline segments will be hydrostatically tested using similar procedures for new pipeline above. Source water is likely to be drawn from the Athabasca, Snaring, Miette and Fraser rivers as well as Moose Lake for the reactivated pipeline segment from Hinton to Hargreaves and from the North Thompson River for the reactivated pipeline segment from Darfield to Black Pines. Discharge water from hydrostatic testing of the previously in-service pipeline segments will require more extensive treatment than new pipeline segments due to the presence of residual hydrocarbons. Holding ponds or tanks will be used to provide storage for the discharge water, which will be treated on-site before release into the environment.
Temporary Facilities	
Site Preparation	Initial site preparation will involve clearing of vegetation where present, salvaging of topsoil or root zone material and grading, where warranted, using equipment similar to that described for construction of the pipeline.
Facility Construction	Sites may be gravelled and/or fenced, depending on site use.
Access	Access to the various types of temporary facilities will be controlled during site use, if warranted, for public safety and to prevent vandalism of equipment and/or facilities.
Facility Dismantle	Any above ground structures (*e.g.*, fencing, buildings) will subsequently be dismantled and removed from the site. Access roads and associated gravel will also be removed.
Reclamation	Reclamation procedures will be initiated following the dismantling of above ground structures using bulldozers, excavators and graders. Debris remaining at temporary facility sites will be removed and disposed of in compliance with local regulations. Site contours will be replaced and the site will be returned to a stable and maintenance-free condition. Depending on the intended land use of the site, topsoil or root zone material will be replaced where salvaged and disturbed areas will be seeded with an appropriate seed mix.
New, Expanded and Reconfigured Pump Stations	
Construction Survey	Activities include staking of the boundaries of the pump station site and temporary workspace as well as marking hot lines and existing utilities. Avoidance areas, such as protected habitats, will be appropriately fenced or flagged.
Clearing and Disposal	Activities associated with vegetation clearing and disposal at pump stations are described above under new pipeline segments.
Topsoil or Root Zone Material Salvage	Topsoil or root zone material, where present, will be salvaged from pump station sites where clearing and grubbing are required. The topsoil or root zone material will be stockpiled in low profile berms or piles adjacent to the site perimeter. The topsoil or root zone material location will be documented for future reference. Equipment used during topsoil or root zone material handling activities may include bulldozers, graders and excavators.
Grading	Following topsoil or root zone material salvage, grading will be conducted on irregular ground surfaces to provide a safe work surface. Graders, excavators, and bulldozers will be used for this activity. Ripping might be required where hard bedrock is encountered.
Piles and Foundations	Once the site is graded, piles will be driven into the ground using pile drivers, where required. In some instances, concrete foundations will be poured using concrete trucks, smoothing equipment, and forms.
Building Installation	Once the piles and foundations are in place, the buildings will be installed. Equipment used during this activity includes cranes, semi-trailers and trucks.
Electrical and Pipeline Connections	The electrical and piping connections will be completed once the buildings have been installed.
Potential Ancillary Infrastructure	Activities associated with construction of the new permanent access road and power line at Black Pines Pump Station and power line at Kingsvale Pump Station are described under permanent pipeline facilities above.
Testing	All systems and processes will be connected and tested. All piping will be pressure tested during fabrication and/or after installation.
Clean-Up and Reclamation	Upon completion of building activities, clean-up and reclamation procedures will be initiated using bulldozers, excavators and graders. Debris remaining at the pump stations will be removed and disposed of in compliance with local regulations. Surface water controls, recontouring, erosion controls and terrain stabilization will be incorporated where necessary. Gravel surfaces will be placed over high-traffic areas of the pump stations (including on-site gravel roads) and fencing will be installed around the sites where none is currently present.
Reactivated Pump Stations	
Inspection, Cleaning and Testing	Reactivation will involve the removal of the existing pumps, motors and valves; inspection, servicing, refurbishment and then reinstallation of these components, testing of the system, and then commissioning of the station, including mechanical, electrical, instrumentation and control systems.
Deactivated Pump Stations	
Inspection and Shut Down	Deactivation will involve shutting-in the pump station; isolating the pump station facilities from the pipeline; purging the pump station facility with nitrogen; maintaining existing power supply; and protecting the equipment as per the manufacturer's recommendations.
Storage Tanks	
Construction Survey	Activities include staking the tank boundaries and temporary workspace as well as marking hot lines and existing utilities.
Clearing and Disposal	Activities associated with vegetation clearing and disposal at terminals are described above under new pipeline segments.
Topsoil or Root Zone Material Salvage	Topsoil and root zone material, where present, will be salvaged as described above under new, expanded and reconfigured pump stations.

TABLE 2.2-1 Cont'd

Construction Phase	Associated Activities
Site Preparation	Following topsoil or root zone material salvage, grading will be conducted on irregular ground surfaces to provide a safe work surface and level tank foundation and to establish suitable drainage at the site. Low wet areas will be dewatered and suitable fill material will be imported as necessary. Graders, excavators and bulldozers will be used for this activity. Ripping may be required where hard bedrock is encountered.
Piles, Foundations and Tank Installation	Once the site is graded, piles will be installed. In some instances, concrete foundations will be poured using concrete trucks, smoothing equipment and forms. Tanks and buildings will be installed on prepared foundations. Secondary containment consisting of compacted clay or a geosynthetic liner will be constructed under and around the tanks. All necessary fire suppression and vapour recovery equipment will be installed. Equipment used during this activity includes welders, cranes, semi-trailers and trucks.
Electrical and Pipeline Connections and Testing	Piping connections will be completed once the tanks have been installed, and all systems and processes will be connected and tested.
Testing	Tanks will be hydrostatically tested. All piping will be pressure-tested during fabrication and/or after installation. Wherever possible, test water will be released to land within a containment structure (*e.g.*, into a lined tank bay). From there, it will be tested for contaminants before being treated and either trucked away or released to a natural water body or the municipal sewer system. If naturally occurring water is likely to be used for an extended period of time (*i.e.*, for multiple tanks), it may need to be treated to prevent the growth of algae or other organic contaminants. Depending on what treatment is used, there may be special requirements for discharge, particularly if the planned discharge is to the environment.
Clean-Up and Reclamation	Upon completion of building activities, clean-up and reclamation procedures will be initiated using bulldozers, excavators and graders. Debris remaining at the terminals will be removed and disposed of in compliance with local regulations. Surface water controls, recontouring, erosion controls and terrain stabilization will be incorporated where necessary. Gravel surfaces will be placed over high traffic areas of the terminals (including on-site gravel roads).
Westridge Marine Terminal	
Construction Survey	Activities include staking all boundaries of the marine terminal land and foreshore footprint and additional temporary workspace as well as marking hot lines and existing utilities.
Dredging	Dredging may be required for foreshore preparation. Equipment used during dredging activities will include barges and clamshell buckets.
Material Disposal	Dredge material will be collected and disposed of in accordance with provincial regulations and municipal bylaws and, if suitable, may be used if suitable for reclamation of the foreshore area and to increase the land base needed for the expansion of the facility.
Dock Construction	Marine structures will likely be supported by tubular steel piles installed into the seabed. Dock structures will be constructed of steel mooring dolphins and catwalks will be constructed of steel that span between the piles. Once the dock structures are completed, the topside equipment such as piping systems, loading arms, vapour recovery piping, and fire protection systems, will be installed. Construction of the docks will mostly be done using floating equipment such as barge-mounted pile drivers and marine derricks.
Existing Dock	Operations at the existing dock are anticipated to continue during construction of the new berths. Once the new docks are in-service, the existing dock will be completely decommissioned and removed. The structures will be removed from the water by removing topside equipment, demolishing the deck structures and extracting the piles from the seabed. If complete removal of the piles is not feasible, they will be cut off at or slightly below the seabed. The demolition material would be removed from site on a barge. Some materials, such as steel and concrete, may be reclaimed and recycled for use in other projects, and some will be disposed in a landfill.
Electrical and Pipeline Connections and Testing	All systems and processes will be connected and tested.
Testing and Inspection	All piping will be pressure-tested during fabrication and/or after installation and all process piping welds will be inspected using either x-ray or ultrasonic methods.
Clean-Up and Reclamation	Upon completion of building activities, clean-up and reclamation procedures will be initiated using barges, bulldozers, excavators and graders. Debris remaining at the terminal will be removed and disposed of in compliance with local regulations. Surface water controls, recontouring, erosion controls and terrain stabilization will be incorporated where necessary. Asphalt or gravel surfaces will be placed over high traffic areas of the terminal (including on-site gravel roads) and fencing will be installed around the sites where none is currently present.

2.2.2 Construction Schedule and Workforce

Pending regulatory approval of the Project, construction of the pipeline and facilities is scheduled over an approximately 24 month period to achieve the planned in-service date of late 2017. Preliminary plans provide for seven pipeline construction spreads, ranging from approximately 34.2 km to 290.4 km in length. It is anticipated that all seven spreads will generally be constructed concurrently during the following consecutive construction seasons: summer 2016; winter 2016/2017; and summer 2017. The length of the construction period for each spread depends on, among other variables, length, land uses, terrain and construction techniques for each spread.

Front-end preparatory activities such as construction right-of-way clearing and access preparation will commence within the first month or second month on any given spread, or earlier to avoid migratory bird windows, followed by topsoil or root zone material salvage, grading, stringing and welding, trenching, pipeline installation, backfilling, machine clean-up and pressure testing. Water crossing installations requiring instream activity will take place outside instream restricted activity periods (RAPs) in Alberta and within least risk windows in BC, unless otherwise approved by the appropriate regulatory authorities for specific watercourse crossings. Segments through wetlands will typically be constructed during dry conditions or frozen conditions to reduce disturbance. Final clean-up and reclamation activities will occur on dry, non-frozen ground throughout summer months of 2017 and 2018, with the exception of inaccessible wet areas, where activities will occur during frozen conditions. Localized remedial activities will occur over the following years for minor restoration repair and maintenance as dictated by weather events.

Pipeline construction activities are progressive. Consecutive phases of the pipeline construction process are expected to overlap as construction progresses along the construction right-of-way within a spread and amongst spreads (*i.e.*, right-of-way preparation, trench excavation, pipeline installation, backfilling and initial clean-up activities will all occur concurrently at different locations along the pipeline route). Crews will be working approximately three months at any given location on the right-of-way. Tie-in locations generally take longer to complete since they are routinely completed last, immediately before and after testing. Certain late stage activities such as testing and final clean-up may be postponed until suitable weather and soil conditions occur.

Activities associated with reactivation of the existing pipeline segments from Hinton to Hargreaves and Darfield to Black Pines will take place over a period of several months, with in-line inspection activities planned for Q3 2016, and excavation, repair and testing activities taking place in Q2 and Q3 of 2017, with operations planned during late 2017.

Construction and equipment installation at pump stations and tank terminals is expected to begin in Q1 2016 and take approximately 8 to 10 months for each pump station and between 14 and 23 months at the terminals, depending on, among other variables, scope, land use and construction techniques for each facility. The construction period for the Westridge Marine Terminal is expected to commence in Q4 2015 with the first berth expected to be in-service by Q3 2017. The second and third new berths are expected to be in-service by late 2017. Demolition of the existing berth is planned to commence in late 2017 after the new berths are commissioned.

A summary of the conceptual construction schedule for each pipeline spread and reactivated pipeline segments is provided in Tables 2.2-2 and 2.2-3, respectively, while Table 2.2-4 summarizes the conceptual construction schedule for pump stations, tanks and the Westridge Marine Terminal. The proposed schedules are subject to modification in response to regulatory approval conditions, outcomes of consultation and engagement, business considerations and market forces, as well as site-specific limitations and constraints, such as the influence of weather conditions on construction activities. For additional information, see Volume 4B.

TABLE 2.2-2

PROPOSED PIPELINE CONSTRUCTION SCHEDULE

Pipeline Spread[1]	From	To	2016												2017											
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Alberta																										
A1	RK 0	RK 49.0																								
A2	RK 49.0	RK 339.4																								
BC																										
BC1	RK 489.6	RK 769.0																								
BC2	RK 811.8	RK 1018.0																								
BC3	RK 1018.0	RK 1078.1																								
BC4	RK 1078.1	RK 1148.0																								
BC5	RK 1148.0	RK 1179.8																								

TABLE 2.2-2 Cont'd

Pipeline Spread[1]	From	To	2016												2017											
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Special Works																										
Lower Fraser River Crossing (RK 1168)																										
Ledgeview Golf Course Crossing (RK 1119)																										
Burnaby Terminal to Westridge Marine Terminal (RK 0 to RK 3.6)																										

Note: 1 Access and clearing activities may start as early as January 2016 at any given location.

TABLE 2.2-3

PROPOSED PIPELINE REACTIVATION SCHEDULE

Reactivation Activities	2016												2017											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Preparation for In-Line Inspection Tool Runs																								
In-Line Inspection Tool Runs																								
Excavation and Repair																								
Hydrostatic Testing																								

TABLE 2.2-4

PROPOSED FACILITIES CONSTRUCTION SCHEDULE

Facility[1]	2015	2016				2017			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Edmonton Terminal									
Edmonton Pump Station									
Gainford Pump Station									
Wolf Pump Station									
Edson Pump Station									
Hinton Pump Station									
Rearguard Pump Station									
Blue River Pump Station									
Blackpool Pump Station[2]									
Black Pines Pump Station[2]									
Kamloops Pump Station									
Kingsvale Pump Station									
Sumas Pump Station									
Sumas Terminal									
Burnaby Terminal									
Westridge Marine Terminal									

Notes: 1 Access and clearing activities may start as early as January 2016 at any given location.

2 Activities at Darfield Pump Station (valve modifications and installation of a new scraper trap) will be conducted in conjunction with construction activities at either Blackpool or Black Pines pump stations.

It is estimated that the Project will require a construction workforce to provide over 1,324,000 worker-days in the 2016 to 2017 construction period, or over 60,000 full-time equivalent worker months.

Pipeline spreads will require approximately 400 to 600 workers per spread depending on, among other variables, length and timing of each spread, region and construction techniques utilized. Construction at terminals will require in the range of approximately 60 to 370 workers, depending on the number of new tanks to be installed and other activities. Construction activities at pump stations will require in the range of 55 to 80 workers, depending on the number of new pumps required and other activities. Construction at the Westridge Marine Terminal will require approximately 95 workers over much of the construction period.

Peak construction workforce for the entire Project (*i.e.*, peak activities combined between all Project components) is anticipated to be 4,475 workers during July 2017 (Figure 2.2-1).

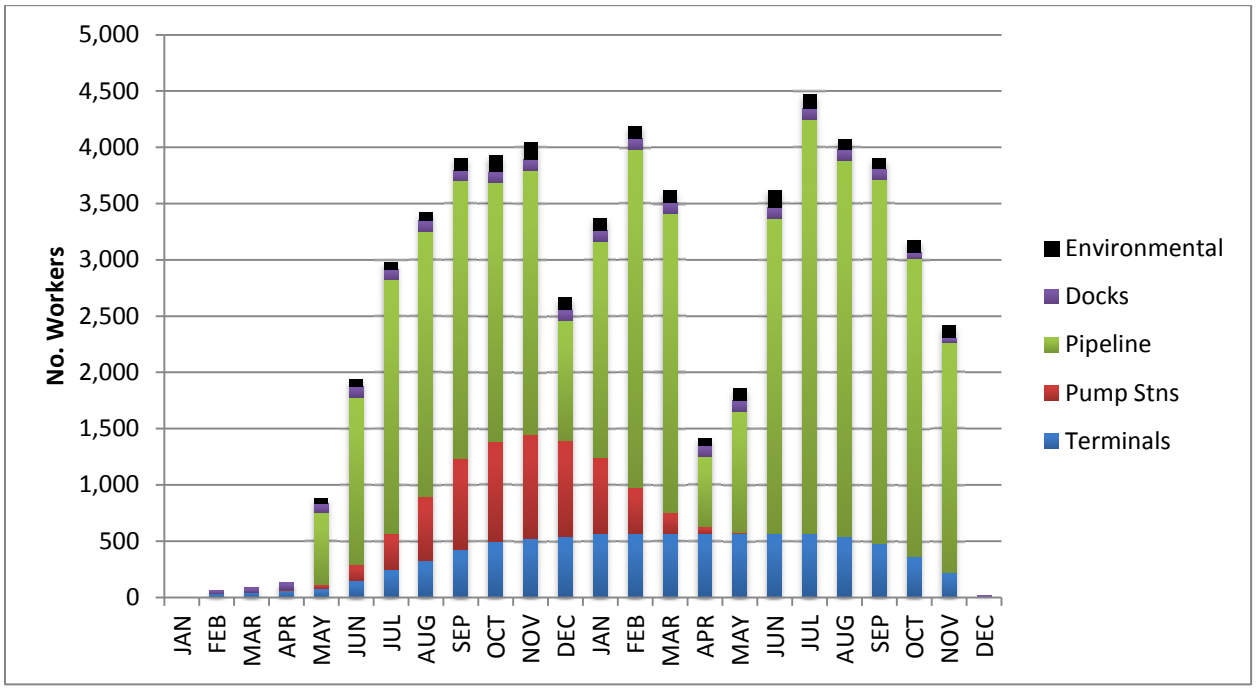

Figure 2.2-1 Estimated Direct Construction Workforce, 2016-2017 (Full-time Equivalent Worker-Months)

Required workforce skills will be varied and will include surveyors, heavy equipment operators, welders, electricians, mechanics, skilled labourers, truck drivers, supervisors, inspectors and monitors. The number of personnel working at any location along the pipeline or facility site will depend on the respective construction phase (*e.g.*, clearing, soil handling, grading, pump and tank installation, dock construction, testing and clean-up).

Large mainline crews construct most of the pipeline within each spread, while smaller specialty crews, working in parallel with mainline crews, complete construction in non-standard sections of the pipeline such as at road, rail, utility and watercourse crossings. Specialty contractors will likely be used for construction in urban or industrial development areas to ensure safe pipeline and facilities installation given the existing utilities and infrastructure situated in the Project area.

2.3 Project Operation

Operations and maintenance activities along the existing TMPL system will be expanded to include the new pipeline and facilities over the operating life of the Project (anticipated to extend beyond 50 years). The following subsections provide an overview of operation and maintenance activities for the Project as well as the anticipated operations schedule and estimated workforce. Additional details regarding Trans

Mountain's operation and maintenance activities, policies, programs and procedures are provided in Volume 4C.

2.3.1 Pipeline

Scheduling of operations and maintenance activities will coincide with periodic aerial and ground patrols of the existing TMPL system and associated facilities. All pipeline patrols are conducted by personnel familiar with the location and operation of the pipeline. Flow in the pipeline will be remotely monitored and controlled from Trans Mountain's existing control centre at the Edmonton Terminal. The pipeline will be maintained from existing bases at Edmonton, Edson, Jasper, Blue River, Clearwater, Kamloops, Hope, Abbotsford and Burnaby. No new pipeline maintenance bases will be required.

Pipeline and right-of-way operations and maintenance activities that could result in potential environmental and socio-economic effects include works associated with regular line patrols, vegetation management and integrity digs.

2.3.2 Pump Stations and Tanks

Routine facility inspections will be performed daily at storage tanks and twice per week at pump stations. The facilities will require periodic mowing of vegetation as well as occasional application of gravel on access roads and the sites. Non-residual herbicides will be used only where mowing and other mechanical methods of vegetation management are impractical, upon approval of the appropriate authority.

All Trans Mountain pump stations and storage tanks have automated leak detection and containment systems that are continuously monitored from the existing control centre at the Edmonton Terminal. Operating staff located at pump stations and terminals are trained in leak detection and emergency response as well as early identification of any potential site hazards such as potential erosion and ground instability. Storage tanks are also taken out of service periodically according to American Petroleum Institute requirements, and are cleaned, inspected and, if required, repaired before being returned back to service.

2.3.3 Westridge Marine Terminal

At the Westridge Marine Terminal, all vessel screening and loading operations have been, and will continue to be, directed by experienced loading masters, who have tanker command experience and are on-site during all vessel loadings. Additional operational details including activities performed by the loading master and preventative and site maintenance activities are provided in Volume 4C.

2.3.4 Operations Schedule and Workforce

Based upon construction beginning in Q1 2016, the operations phase of the Project is expected to begin in Q4 2017.

In addition to the existing Trans Mountain staff, once fully operational, the Project is expected to require 90 full-time personnel, of which 50 are anticipated to be located in BC and 40 are anticipated to be located in Alberta.

2.4 Decommissioning and Abandonment

It is difficult at this time to predict when or how the pipeline and facilities will be decommissioned and abandoned at the end of the Project's useful life. The existing TMPL system has been operating successfully for 60 years and will be safe and reliable for many more as a result of continuing proactive maintenance and integrity programs. The operational life of the new pipeline is anticipated to be as long or longer.

Trans Mountain is participating in and will comply with the process established by Stream 3 of the NEB Land Matters Consultation Initiative and Reasons for Decision RH-2-2008. In addition, as part of this application, Trans Mountain filed with the NEB a preliminary abandonment plan (see Volume 4C) providing a discussion of the abandonment planning strategy for the pipelines and facilities to be constructed for TMEP. The plan discusses general activities for the types of facilities that would be

abandoned in place, abandoned in place with special treatment or removed. The plan also discusses general reclamation objectives and principles that would be applied during abandonment to return the right-of-way and facility sites to a state comparable with the surrounding environment. The methods of abandonment and reclamation that will ultimately be implemented for the Project will be determined at the time the pipeline is removed from operation, however, those determinations will be based on the most current sound scientific studies and accepted industry practice at that time. Any decommissioning or abandonment activities will require prior approval by the NEB and other applicable regulatory authorities. Decommissioning and abandonment is discussed further in Section 7.0, and also in Volume 4C, Section 12.0 Preliminary Abandonment Plan.

3.0 PUBLIC CONSULTATION, ABORIGINAL ENGAGEMENT AND LANDOWNER RELATIONS

Trans Mountain Pipeline ULC (Trans Mountain) has implemented and continues to conduct open, extensive and thorough public consultation, Aboriginal engagement and landowner relations programs. These programs were designed to reflect the unique nature of the Trans Mountain Expansion Project (TMEP or the Project) as well as the diverse and varied communities along the proposed pipeline and marine corridors. These programs were based on Aboriginal community, stakeholder and landowner groups' interests and inputs, knowledge levels, time and preferred method of engagement. In order to build relationships for the long-term, these programs were based on the principles of accountability, communication, local focus, mutual benefit, relationship building, respect, responsiveness, shared process, sustainability, timeliness and transparency.

This section provides a summary of the design of the public consultation (Section 3.1), Aboriginal engagement (Section 3.2) and landowner relations (Section 3.3) programs, as well as outcomes specific to socio-economic elements considered in the Environmental and Socio-Economic Assessment (ESA). The full description of the public consultation, Aboriginal engagement and landowner relations programs are located in Volume 3. The outcomes of the consultation and engagement activities for the pipeline and facilities component of the Project specific to biophysical elements and for the marine transportation component of the Project that was assessed pursuant to the NEB's instruction in their List of Issues, issued July 29, 2013, are located in other sections and volumes of the application. Table 3.0-1 provides information on where these other consultation and engagement considerations are located.

TABLE 3.0-1

CONSULTATION INFORMATION LOCATION

Consultation Information	Application Location
Pipeline and Facilities	
Public Consultation	Volume 3A Section 3.1 of Volume 5A
Aboriginal Engagement	Volume 3B Section 3.2 of Volume 5A
Landowner Relations	Volume 3C Section 3.3 of Volume 5A
Marine Transportation	
Public Consultation	Volume 3A Section 3.1 of Volume 8A
Aboriginal Engagement	Volume 3B Section 3.2 of Volume 8A

3.1 Public Consultation

The principles of the stakeholder engagement program are based on public input as well as various stakeholder groups' interests, knowledge levels, time and preferred method of engagement. This subsection provides information on the stakeholder engagement program for the pipeline corridor and describes how stakeholder and public comments relating to the ESA were gathered as well as how these comments have been incorporated into the application.

3.1.1 Design of the Socio-Economic Environment Public Consultation Program

As part of the stakeholder engagement program, Trans Mountain has taken on an open, extensive and thorough public consultation process, commonly known as stakeholder engagement. Engagement touched on all aspects of the Project along the proposed pipeline corridor from Strathcona County, Alberta (near Edmonton, Alberta) to Burnaby, BC and marine communities from Nanaimo to Sooke, Vancouver Island and Salt Spring Island. Trans Mountain has reached out to the general public, community and business organizations, community leaders, elected officials and environmental groups to

receive their input. Open houses and public presentations provide opportunities for public input and queries.

The Project team received feedback from public open houses (also referred to as information sessions), workshops, one-on-one meetings, public presentations, online discussion, comment forms, email and phone calls that have helped shape aspects of the Project. Key topics and issues are relayed to the appropriate Project team representative to be considered and incorporated in the application, where applicable. For more information on feedback from all engagement, refer to Volume 3A. Overall, engagement activities have provided feedback on the following:

- determining the scope of the ESA;
- identifying potential mitigation measures to reduce environmental and socio-economic effects;
- identifying potential benefits associated with the Project; and
- routing alternatives where it is not practical to follow the existing Tran Mountain pipeline system (TMPL) right-of-way.

The stakeholder engagement program is designed to foster participation from members of the public who have an interest in the scope, activities and routing of the Project. The program seeks meaningful input from stakeholders regarding the proposed pipeline corridor and potential socio-economic effects and benefits. The stakeholder engagement program will also share timely information with stakeholders to keep them informed throughout the process. Through preliminary evaluation of the proposed pipeline corridor and surrounding communities, stakeholder groups that have a potential interest in the Project have been identified in the Table 3.1-1.

TABLE 3.1-1

IDENTIFIED STAKEHOLDER GROUPS FOR PIPELINE CORRIDOR

Stakeholder Type	Stakeholder Type Sub-Categories
Government Authorities	• Government of Canada (federal agencies) • Government of Alberta • Government of BC • municipal governments • regional governments • Transit Authority • Universities and colleges
Environmental Non-Government Organizations (ENGOs)	• local ENGOs • provincial ENGOs • national ENGOs
Interest Groups	• chambers of commerce • economic development associations • recreation groups • labour groups • local and regional associations and organizations • business/industry associations • agricultural/environmental associations • local interest groups
Industry	• oil and gas industry • pipeline industry • potential suppliers and contractors • other infrastructure (*e.g.*, CN Rail) • construction industries • terminal operators in Burrard Inlet (including other product terminals)
Public	• public living or working in pipeline corridor communities • public living outside of pipeline corridor communities

3.1.1.1 Public

The stakeholder engagement program includes public involvement in order to build awareness and understanding of the Project, manage information flow, identify concerns and issues, as well as gather public input into Project plans and design. Trans Mountain's target audience included all interested and potentially affected parties along the proposed pipeline corridor.

3.1.1.2 Focus Participants

The stakeholder engagement program involved focused discussions with small groups of directly affected interested stakeholders. Stakeholders had the opportunity to provide feedback on the proposed pipeline corridor as well as important issues related to the ESA. These participants included representatives from local governments, community organizations, economic development organizations, recreational groups, and ENGOs. Through building relationships with the focus participants, Trans Mountain gathered informed input, identified issues or concerns and, where appropriate, developed early mitigation measures.

3.1.1.3 Geographic Reach of Public Consultation Program

Trans Mountain recognizes that the extensive scope and scale of the Project will result in interest by members of the broader public as well as stakeholders directly affected by the Project. In order to ensure that communications and engagement opportunities are appropriately tailored to the needs and interests of local communities, engagement activities were divided into pipeline corridor communities (those potentially affected directly by the proposed pipeline and related facilities) and marine communities, which were assessed pursuant to the NEB's instruction in their List of Issues, issued July 29, 2013. In addition, pipeline corridor and marine communities were further divided into the following five regions:

- Alberta;
- BC Interior;
- Lower Mainland/Fraser Valley;
- Mainland Coastal; and
- Island Coastal communities.

As Trans Mountain proceeded through the pre-application phase of the Project, the stakeholder engagement program allowed for the identification of new information and additional stakeholders. The grouping of these communities was completed following preliminary conversations with stakeholders and municipal governments to identify local interests and needs. Table 3.1-2 provides the regional breakdown as well as the core communities associated with the proposed pipeline corridor and marine areas.

TABLE 3.1-2

STAKEHOLDER ENGAGEMENT – PIPELINE CORRIDOR AND MARINE COMMUNITIES

Pipeline Corridor			Marine	
Alberta	BC Interior	Lower Mainland/Fraser Valley	Mainland Coastal	Island Coastal
• Strathcona County • Hamlet of Sherwood Park • City of Edmonton • Parkland County • City of Spruce Grove • Town of Stony Plain • Village of Wabamun • Yellowhead County • Town of Edson • Town of Hinton • Municipality (Town) of Jasper	• Village of Valemount • Community of Blue River • Community of Avola • Community of Vavenby • District of Clearwater • Community of Little Fort • District of Barriere • City of Kamloops • City of Merritt • District of Hope[1] • Regional District of Fraser Fort George (RDFFG) • Thompson-Nicola Regional District (TNRD)	• District of Hope[1] • Fraser Valley Regional District (FVRD) • City of Chilliwack • City of Abbotsford • Township of Langley • City of Coquitlam • City of Port Coquitlam • City of Burnaby[2] • City of Surrey • City of Vancouver • Metro Vancouver Regional District[2]	• City of Burnaby[2] • Village of Anmore • Village of Belcarra • City of North Vancouver • City of Port Moody • City of Richmond • City of Vancouver • City of White Rock • Corporation of Delta • District of North Vancouver • District of West Vancouver • Bowen Island Municipality • University Endowment Lands/Metro Vancouver Electoral Area "A" • Metro Vancouver Regional District[2] • Squamish Lillooet Regional District • Village of Lions Bay • District of Squamish	• Corporation of the City of Duncan • City of Nanaimo • Nanaimo Regional District • Alberni – Clayoquot Regional District • Corporation of the City of Victoria • Cowichan Valley Regional District • Corporation of the District of Central Saanich • District of Metchosin • District of North Saanich • Corporation of the District of Oak Bay • Corporation of the District of District of Saanich • District of Sooke • Islands Trust Areas • Capital Regional District • Sunshine Coast Regional District • Town of Sidney • Corporation of the Township of Esquimalt

Notes: 1 The District of Hope, while a member of FVRD, is allocated for the purposes of stakeholder engagement activities under the BC Interior Region and the FVRD is allocated under the Lower Mainland/Fraser Valley Region.

2 Due to the location of the City of Burnaby and the Metro Vancouver Regional District, these two communities have been engaged under the Lower Mainland/Fraser Valley Region as well as the Mainland Coastal Region.

3.1.2 Phased Activities

The stakeholder engagement program adopted a phased approach to public and stakeholder engagement. Each phase was developed in response to information gathered from the previous phase as well as identified interests and needs. The current stakeholder engagement program consists of six phases, which include:

- Phase 1 Engagement: Stakeholder and Issue Identification, May to September 2012;
- Phase 2 Engagement: Public Information and Input Gathering, October 2012 to January 2013;
- Phase 3 Engagement: Community Conversations, February to July 2013;
- Phase 4 Engagement: Feedback to Stakeholders and Application Filing, August to December 2013;
- Phase 5 Engagement: Regulatory Process to In-Service, January 2014 to in-service; and
- Phase 6 Engagement: Operational Consultation.

3.1.3 Stakeholder Engagement Program Execution

The stakeholder engagement program was designed to foster positive relationships with the public and stakeholders as well as provide opportunities for stakeholders to be involved in the engagement process. The following section provides information on the activities that have taken place during the three phases of engagement activities conducted from the time of the Project announcement in May 2012 to the end of Phase 3 on July 31, 2013.

3.1.3.1 Enhanced Communications Initiatives

The communications initiatives support the consultation activities by providing notification about the various engagement opportunities including public open houses, Community Workshops and online discussion activities.

From producing printed newsletters to talking about Project details on social media channels to answering public and media inquiries to participating in speaking opportunities, the stakeholder engagement and communications team uses a variety of methods to reach various audiences. The communications initiatives include:

- a comprehensive website with information about various components of the Project and the industry;
- proactively distributing Project updates via email to people who have signed up through the Project website at open houses or through other means;
- Twitter and YouTube posts to reach people who use social media channels;
- providing various forums for people to ask questions: toll-free phone line, email, a website question and answer forum, and direct letters;
- a full media relations service including a dedicated media toll-free phone line; and
- a modest advertising campaign aimed at notifying people about ways they can engage with members of the Project team – in person or online.

The Trans Mountain stakeholder engagement and communications team provides those interested in the Project with a range of sources of information and platforms to encourage discussion and education. For more information on the Project stakeholder engagement and communication strategy, refer to Volume 3A.

<u>Phase 1 Engagement: Stakeholder and Issue Identification, May to September 2012</u>

Phase 1 of the stakeholder engagement program focused on Project introduction and the flow of Project information to the government, municipalities and key stakeholders. This phase included identifying stakeholders with interest in participating in the stakeholder engagement program, local community interests and concerns, and appropriate consultation methods. Trans Mountain provided information through mail and email, website posts, as well hand delivering information to stakeholders at Project introduction meetings.

<u>Phase 2 Engagement: Public Information and Input Gathering, October 2012 to January 2013</u>

Phase 2 of the stakeholder engagement program continued the outreach and discussions with municipalities and other stakeholders. In addition, Trans Mountain conducted a series of public information sessions along the proposed pipeline corridor. Content and format varied by the needs and interests of the communities. Trans Mountain provided Project overview information as well as the scope of the proposed pipeline corridor socio-economic assessment. Trans Mountain focused on engaging the public through open house style information sessions and seeking input through conversation, feedback forms, online discussion, and a Project-specific Twitter channel. Trans Mountain continued meeting with stakeholders and government representatives.

Trans Mountain attended the 2012 Union of British Columbia Municipalities (UBCM) convention in Victoria, BC, and later hosted a full day open house for UBCM delegates. In addition, Trans Mountain sent letters to local governments along the marine corridor offering individual meetings with representatives in Victoria, for which seven meetings with councils were arranged.

Environmental Non-Government Organizations

Research and early conversations guided the scope of engagement with stakeholders on environmental issues in different ways, based on the level of control and responsibility Trans Mountain has over each issue. Some common marine environmental concerns identified by stakeholders in this phase include effects of marine oil spills on the biodiversity, the fishery industry, human health as well as costs related to clean up of potential marine spills, among others.

Public Open Houses

Public open houses were structured as drop-in events where members of the public were invited to attend, gain information and ask questions about the Project. Project information was displayed on story boards positioned throughout the venue. Technical experts including representatives from environment, routing, geotechnical, regulatory, operations, stakeholder engagement and media relations were on hand to answer questions and receive comments and concerns from attendees. In addition, material was available as handouts and posted on the Project's website.

Phase 3 Engagement: Community Conversations, February to July 2013

Phase 3 of the stakeholder engagement program focused on seeking meaningful input from stakeholders on the proposed approach to the ESA. Engagement meetings in this phase of the program included ESA Workshops, Community Workshops and focused public information sessions in some communities on proposed Project routing. Community meetings focused on sharing updated Project information, seeking meaningful input from affected stakeholders on proposed route alternatives in areas where it is likely that the route will deviate from the existing TMPL right-of-way as well as seeking input from local stakeholders on potential Project effects and mitigation measures.

Environmental Non-Government Organizations

Engagement efforts in Phase 3 focused on local environmental groups based in communities along the pipeline and shipping corridor. Feedback from these local groups was particularly important during routing and ESA Workshops where local environmental knowledge helped to identify issues of concern in study areas as well as possible mitigation measures, and possible compensation or net benefit initiatives to consider as part of the overall Project proposal.

ESA Workshops

In Phase 3, Trans Mountain hosted ESA Workshops to provide information on the proposed approach used for the Project ESA and to seek input from stakeholders regarding study approach, methodology and regions. The Project traverses distinct geographic regions that include diverse ecosystems ranging from grasslands to rainforest. Regional experts were asked to attend ESA Workshops in representative communities in order to capture specialist knowledge for each region. The ESA Workshops targeted local and regional subject matter experts from municipal, federal and provincial governments, local ENGOs and other environmental interest groups. Trans Mountain hosted the ESA Workshops for Alberta in Edmonton and for BC in Kamloops, Surrey and Abbotsford.

The Project team provided attendees with a proposed overview of the ESA approach for the Project and sought the feedback of attendees on particular modules of the ESA including air, land and water. The ESA Workshop in Abbotsford focused on soil and agriculture as these subjects were of greatest concern to the community. Input was solicited online for 2 weeks after each workshop; information presented at the workshops was made available online following each session. Feedback received at these sessions was shared with the relevant environmental disciplines and was considered in setting the scope and methodologies for the Project's socio-economic assessment.

Community Workshops

In Phase 3, Trans Mountain hosted a series of Community Workshops along the proposed pipeline corridor to provide an opportunity for local stakeholders to receive updated information and provide feedback on issues and concerns relative to their community. Community Workshops were attended by stakeholders that held expertise on community interests, the environment, economic activity, recreation and land use. Participation included municipal representatives, local community representatives, business groups, recreational representatives and guides and outfitters. Community Workshops comprised ESA poster presentations and oral presentations on land, air, water and human activity, as well as an exit survey. All information presented at the workshops was made available online the day following each session and was live for three weeks. Trans Mountain hosted Community Workshops for Alberta in Edmonton, Parkland County (Wabamun), Edson and Hinton. Trans Mountain hosted Community Workshops for BC in Valemount, Blue River, Clearwater, Kamloops, Merritt, Hope, Chilliwack, Abbotsford, Langley, Surrey, Coquitlam and Burnaby.

Phase 4 Engagement: Feedback to Stakeholders and Application Filing, August to December 2013

The goals of the Phase 4 stakeholder engagement program include sharing the results of the marine studies, environmental field studies with stakeholders, commencing communications on the application and next steps for engagement, and communications following the filing of the application. Further details regarding refined Project plans prior to filing the application with the NEB will be shared with the public.

Engagement activities will include community and economic benefit presentations in conjunction with the Chambers of Commerce, attending events, one on one meetings, emergency response workshops and presentations/speaking opportunities. Meetings with local government and interested parties will be ongoing. Trans Mountain will continue digital engagement efforts and seek out more public opportunities to share information and gather feedback.

Planned Consultation on Reactivation

Trans Mountain is planning to reactivate two 610 mm (24 inch) segments of existing pipeline (from Hinton, Alberta to Hargreaves, BC and from Darfield, BC to Black Pines, BC) as part of the TMEP. Stakeholders include Parks Canada, the Town of Jasper, the Town of Hinton, Yellowhead County, BC Parks, local stewardship groups and the public. Project planning is currently underway and further stakeholder input will be sought as technical requirements for deactivation are further defined.

Phase 5 Engagement: Regulatory Process to In Service, January 2014 to In-Service

Additional engagement phases will be developed to support the regulatory process and, if successful, the construction phases of the Project. The goals of these engagement phases will include sharing results of any new studies or work being completed on the Project, to communicate any changes to Project plans, to share information with stakeholders on the regulatory process and to engage on construction effects and mitigation measures. Additional objectives include communicating about the benefits of the Project to local stakeholders and engaging on environment offsets.

Engagement continues with environmental groups related to the Project in regards to refining environmental input for consideration in the environmental assessment process, feedback on the approach to ecological compensation (conservation offsets), and the development and communication of geographic spill response plans. Engagement also continues with coastal stakeholders and Aboriginal communities related to the environmental aspects of the Project. Trans Mountain is also encouraging new relationships between these groups and certified spill responders so that more information can be shared about areas of high ecological value on BC's southwest coast.

Phase 6 Engagement: Ongoing Operational Consultation, Post-Construction Throughout Operational Life

Trans Mountain is committed to respectful, transparent and collaborative interactions with communities to develop long-term effective relationships. Once the pipeline becomes operational, engagement opportunities will continue through the hosting open houses, providing newsletters and Project updates,

making safety and public awareness presentations, participating in community events, regulatory processes and through ongoing informal meetings with stakeholders.

Initiatives to be activated during this phase will be developed in the lead up to construction. Trans Mountain, however, is committed to ongoing consultation in the communities in which it operates.

3.1.4 Summary of Outcomes of the Public Consultation Program as it Relates to Socio-Economic Elements

Trans Mountain designed the stakeholder engagement program to involve people who may be affected or have interest in the Project. Through the first three phases of engagement, Trans Mountain has had the opportunity to provide Project information through various methods and receive general comments as well as specific information for route and Project planning. Trans Mountain has engaged stakeholders in dialogue to discover the social and environmental issues or concerns that matter most to them. Trans Mountain has tracked these conversations and relayed the key topics to the Project representative to be considered and incorporated in the application, where applicable. Tables 3.1-3 to 3.1-9 provide information on the key topics relating to the socio-economic assessment and where these topics are addressed in the application.

3.1.4.1 Social and Cultural Well-Being

TABLE 3.1-3

INTERESTS OR CONCERNS RELATED TO SOCIAL AND CULTURAL WELL-BEING

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Proximity to schools, hospitals Concern for routing near schools	Where practical, the alignment of the proposed expansion route will parallel the existing TMPL. Trans Mountain recognizes that many regional changes have occurred since the pipeline was installed 60 years ago and that some routing decisions made today would be different. In some areas, Trans Mountain is looking at options that go beyond the current operational corridor. Alternate routes for the proposed expanded pipeline may be necessary — especially in areas where land use has changed since the pipeline was built nearly 60 years ago. The selection of the proposed pipeline corridor included both field and desktop assessments of the existing TMPL right-of-way and alternative routing locations, which resulted in a proposed pipeline corridor. The proposed pipeline corridor will be designed and constructed in accordance with all applicable standards, and was chosen on the basis of minimal new disturbance and effects to the public. Where land use has changed since the pipeline went into operation in 1953, there may be a need to route parts of the new line away from the existing TMPL right-of-way. In these cases, Trans Mountain will look at alternatives through comprehensive routing studies in combination with its consultation process. To minimize effects to the urban landscape and landowners, the proposed route of the new pipeline would follow existing linear infrastructure to the extent practical, such as municipal streets or highway, railway or utility corridors, or in some cases parklands. In communities where routing may deviate from the existing TMPL right-of-way, Trans Mountain will discuss and apply routing considerations and decision-making criteria in discussions with local stakeholders. Trans Mountain will continue to engage and communicate with communities as new information becomes available. Trans Mountain will continue to contact landowners along the existing TMPL right-of-way, and when route alternatives are selected, Trans Mountain will work with landowners to identify mutually agreeable solutions to concerns. Trans Mountain will inform landowners and lessees of the route location and construction schedule, to allow sufficient time to plan and implement alternative land use decisions. Particular attention will be paid to specialized agricultural production systems (*e.g.*, poultry, nursery or berry crop operations). Trans Mountain will locate and flag all existing buried utility lines and cables to be crossed by the pipeline prior to the commencement of ground disturbance activities by using "one call" services in addition to direct contact with utility owners. A discussion of routing principles and selection of the proposed pipeline corridor is provided in Section 4.0. Schools and hospitals are considered community assets that contribute to community way-of-life and are discussed under social and cultural well-being in Sections 5.3 and 7.2.3.	Volume 5B Sections 4.0, 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report

TABLE 3.1-3 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Awareness/mitigation of potential social issues with influx of workers into communities, and increase in traffic. Does Trans Mountain have a traffic management plan?	Socio-economic studies have been conducted to assess existing conditions and types of land use in the Project area, as well as possible effects. Mitigation strategies and management plans are being developed through discussions with regulatory authorities, Aboriginal communities and stakeholders to help minimize the potential effects of the Project on biophysical and human environments. Trans Mountain's engagement process will continue throughout the development of the facilities application to the NEB, as well as after it is filed in late 2013. Opportunities for stakeholders to provide feedback, express concerns and submit suggestions will be available through the entire process until the proposed expanded pipeline operations begin, if the Project is approved. The influx of workers into communities and the potential effects on community way-of-life are discussed under social and cultural well-being in Sections 5.3 and 7.2.3 as well as under community health as it relates to socio-economic health effects, public safety and health care service provision in Sections 5.8 and 7.2.8. Traffic concerns are discussed under infrastructure and services in Sections 5.5 and 7.2.5 as well as under community health as it relates to public safety in Sections 5.8 and 7.2.8. The Pipeline and Facilities Environmental Protection Plans (EPPs) (Volumes 6B and 6C, respectively) contain a traffic management plan.	Volume 5B Sections 5.3, 5.5, 5.8, 7.2.3, 7.2.5 and 7.2.8 Volume 5D Socio-Economic Technical Report Community Health Technical Report Volume 6B Volume 6C
Fear of spills near schools and residential neighbourhoods	Pipeline safety is a common interest and a value shared by Trans Mountain. Trans Mountain has heard some specific questions about the pipeline and its safe operation near homes and schools and welcomes any opportunity to provide information and respond to questions. Since the TMPL began operating in 1953, many communities have grown and developed around the pipeline right-of-way. It is important to understand that while the pipeline may be near homes and schools, it does not run under any buildings. Living or being active near a pipeline does not pose a health risk. There are community trails, sporting events, community gardens and all kinds of businesses and agricultural activities safely co-existing near the TMPL. Safety is a top priority and at the core of who Trans Mountain is as a company. Dedicated staff work to maintain the integrity of the pipeline through maintenance, inspection and awareness programs. While no spill is acceptable to Trans Mountain, accidents can happen. Trans Mountain has a comprehensive response plan that includes working with local regulatory authorities to make sure the public and the environment are kept safe. Where the pipeline runs near schools, Trans Mountain is open to working with individual schools or districts to fully support their safety efforts and ensure their emergency response plans and Trans Mountain's are coordinated. Community perspectives of an oil pipeline as it pertains to community way-of-life are discussed under social and cultural well-being in Sections 5.3 and 7.2.3. Large onshore spill scenarios are discussed in Volume 7.	Volume 5B Sections 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report Volume 7

3.1.4.2 Human Occupancy and Resource Use

TABLE 3.1-4

INTERESTS OR CONCERNS RELATED TO HUMAN OCCUPANCY AND RESOURCE USE

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Concerns about effects to community recreation grounds on existing right-of-way Use of the Project right-of-way as a recreational trail Effect to the enjoyment of existing right-of-way as recreational green space Is there potential for shared use (recreational) around the Sumas Terminal?	Trans Mountain is aware that people use the existing TMPL right-of-way for recreational purposes. This can be challenging as the community believes it is a part of the open space and park system when it is a major utility corridor and Trans Mountain is only there as a secondary land use. Trans Mountain is open to discussing recreational use of the right-of-way; activities such as walking, hiking and biking would be great recreational uses for the right-of-way. Trans Mountain does restrict motorized vehicle access like snowmobiles and all-terrain vehicles (ATVs) because they can cause disturbance to the ground. Trans Mountain is open to discussing opportunities to leave infrastructure post-construction to benefit recreational users. A discussion of routing principles and selection of the proposed pipeline corridor is provided in Section 4.0. Parks and protected areas and recreation trails are addressed as part of outdoor recreation under human occupancy and resource use (HORU) Sections 5.4 and 7.2.4.	Volume 5B Sections 4.0, 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report
Routing through residential areas	Since the TMPL began operating in 1953, many communities have grown and developed around the pipeline right-of-way. It is important to understand that while the pipeline may be near homes and private property, it does not run under any buildings. Living or being active near a pipeline does not pose a health risk. There are community trails, sporting events, community gardens and all kinds of businesses and agricultural activities safely co-existing near the TMPL. Trans Mountain recognizes that many regional changes have occurred since the pipeline was installed 60 years ago and that some routing decisions made today would be different. Where new roads and infrastructure have been built, and patterns of land use have changed with the growth of communities, Trans Mountain is listening to landowners and will consider deviating from the existing route while balancing operational, engineering, environmental, community and economic factors. It is Trans Mountain's intention to find a route for the proposed pipeline that minimizes effects to residences and communities. Where privately-held land is needed for the proposed new route, land agents from Trans Mountain have ongoing discussions regarding the proposed pipeline corridor with landowners. Trans Mountain's goal is to reach mutually-acceptable agreements with landowners to allow Trans Mountain to build and maintain the proposed new pipeline. A discussion of routing principles and selection of the proposed pipeline corridor is provided in Section 4.0. Residential use areas are discussed under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 4.0, 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report
Mitigations for trail-users during and after construction	Trans Mountain conducted environmental and socio-economic studies along the proposed pipeline corridor to gather data for the ESA. This assessment will consider: the potential environmental and socio-economic effects of the construction, operations and maintenance of the pipeline; ways in which these effects can be minimized or avoided altogether; and mitigation and reclamation strategies that will further reduce these effects. Overall, Project-related effects on recreation use are addressed in the ESA. This will include development of mitigation measures to reduce effects and optimize opportunities to enhance recreational use. Proposed mitigation/enhancement measures form part of the ESA, which was completed in late 2013, and then will be carried forward into the planning and design of the Project. This issue is addressed as part of outdoor recreation under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report
Effects to outdoor recreation and tourism as well as sportfishing	Outdoor recreational activities, such as hunting, camping, hiking, mountain biking, trail rides, wildlife viewing and snowmobiling are expected to occur at numerous locations along the proposed pipeline corridor. Additionally, outdoor water-based recreational activities along the proposed pipeline corridor include canoeing, kayaking, rafting, rowing, tubing and fishing. Recreational fishing occurs on large watercourses and lakes. Outdoor recreation activities are discussed under HORU in Sections 5.4 and 7.2.4.	

TABLE 3.1-4 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Potential effects to water-based recreation and tourism	During construction Trans Mountain will provide advanced and ongoing notification to users of the area to ensure they are fully aware of the activities that will occur and are occurring. Should the Project affect recreational users' infrastructure during construction, mitigation processes will ensure the infrastructure is left in the same, if not better condition. Actual methods will be discussed with landowners and or permit holders. Trans Mountain is open to discussing opportunities to leave infrastructure post-construction to benefit recreational users. As with all of its construction Projects, Trans Mountain will reclaim any areas that are affected by the proposed pipeline including the pipeline right-of-way and surrounding areas following construction. This could include adding new footpaths, developing new habitats, improving water crossings or bettering migration corridors. Post-construction environmental monitoring and ongoing right-of-way maintenance will continue following construction. Water-based recreation is considered as part of outdoor recreation under HORU in Sections 5.4 and 7.2.4 as well as Navigation and Navigation Safety in Sections 5.6 and 7.2.6.	Volume 5B Sections 5.4, 5.6, 7.2.4 and 7.2.6 Volume 5D Socio-Economic Technical Report
Potential opportunity to leave infrastructure (*e.g.*, swamp mats, crossing structures) behind to benefit users of recreational trails	Project-related effects on recreation use have been addressed in the ESA. This includes development of mitigation measures to reduce effects and optimize opportunities to enhance recreational use. Outdoor recreation use is discussed under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report
Agricultural and resource extraction land uses (HORU – disruption to agricultural and grazing activities and farm productivity)	Agriculture land uses such as grazing pastures, field crops, organic and specialty crops (*e.g.*, blueberries, raspberries, nurseries) and livestock facilities are located along the proposed pipeline corridor. Trans Mountain is working with landowners to reduce the potential disturbance to agricultural lands and disruption of agricultural practices during construction. Appropriate mitigation (*e.g.*, soil handling, erosion control) and monitoring activities will be implemented during construction to maximize reclamation success. Additional special reclamation measures will be applied, as required, to return the disturbed areas to a stable and maintenance-free condition. As part of the proposed post-construction environmental monitoring (PCEM) program, Trans Mountain will monitor revegetation growth on the construction right-of-way and implement remedial measures where necessary. A discussion of agriculture is provided under HORU in Sections 5.4 and 7.2.4 while the PCEM program is provided in Volume 6A.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report Agricultural Assessment Technical Report: Volume 6A
Future land use	The primary design objective is to construct the Project within or adjacent to the existing TMPL right-of-way and, where this is not possible, minimize any new linear disturbance. The proposed pipeline corridor was selected to minimize effects on the environment, maximize worker and public safety, and minimize other social effects. Appropriate mitigation (*e.g.*, soil handling, erosion control) and monitoring activities will be implemented during construction to optimize reclamation success. Additional special reclamation measures will be applied, as required, to return the disturbed areas to a stable and maintenance-free condition. Primary road and railway crossings will be bored to minimize interference with existing activities and usage. Land use activities are addressed under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report

TABLE 3.1-4 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Aesthetic effects around the Westridge Marine Terminal	The TMEP Team has worked extensively with Port Metro Vancouver (PMV), the Pacific Pilotage Authority (PPA) and the BC Coast Pilots (BCCP) to determine a preferred dock layout at the Westridge Marine Terminal. Trans Mountain has also incorporated feedback from the City of Burnaby and community discussions into the ESA. The team considered approximately 20 layouts during the evaluation and study process. The layout currently being evaluated is considered to be the most favourable. The team's technical goal was to develop a layout that would provide: • three Aframax-capable berths, reducing the percentage of time that tankers visiting Westridge use anchorages west of the Second Narrows; • the highest level of navigational safety (for berthing, for other vessel traffic in the inlet and considering the existing anchorages); • the ability to keep the existing dock in service during construction of the new dock; • ways to minimize the overall footprint to provide the least impact to community views; • opportunities to minimize or eliminate dredging in order to provide the least impact to the marine environment; and • ways to minimize noise disturbances. A conceptual design for Westridge Marine Terminal, based on preliminary engineering is available on the Trans Mountain website (http://www.transmountain.com/marine-westridge-terminal). The design may change after further developmental and detailed engineering. Aesthetic attributes are discussed under HORU in Sections 5.4 and 7.2.4 and 7.6.4.	Volume 5B Sections 5.4, 7.2.4 and 7.6.4 Volume 5D Socio-Economic Technical Report Viewshed Modeling Analysis Technical Report
If artificial lighting is used to extend construction hours, participants asked that care be taken to avoid 'light pollution' in their neighbourhood	Noise, dust and other disturbances will be mitigated to avoid the effects on people near the construction. Every effort is made to minimize effects to landowners and neighbours from surveying and staking the right-of-way to final clean-up. In areas where there may be a concern regarding the safety of the public, restricted areas are established. During the construction phase, Trans Mountain will schedule work for daylight hours, where feasible. The Environmental Inspector(s), in consultation with Trans Mountain's environmental staff, will determine appropriate procedures to be implemented to limit light pollution during the dark hours during construction, such as directing the lighting for all construction activities downward and, where feasible, positioning lighting to avoid or reduce effects to nearby residents. Similar procedures will be followed during the operational phase. Guidelines have been established in the Pipeline EPP (Volume 6B).	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report Volume 6B
Crop insurance and compensation	Trans Mountain's compensation plan will provide for valid effects, losses or damages to crops within the construction footprint and temporary access routes, as may be required. Further discussion is provided under the HORU indicator, Agricultural Use, in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Agricultural Assessment Technical Report
How will construction affect organic farming certification?	Mitigation measures that addresses equipment cleaning, the restriction of herbicides for weed management, disposal of construction materials and garbage and soil management considerations have been identified within the Agricultural Management Plan for construction on organic fields (see Pipeline EPP of Volume 6B). Further discussion is provided under the HORU indicator, Agricultural Use, in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6B

TABLE 3.1-4 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Routing through recreational areas and facilities	Where practical, the alignment of the proposed pipeline corridor will parallel the existing TMPL. Trans Mountain recognizes that many regional changes have occurred since the pipeline was installed 60 years ago and that some routing decisions made today would be different. In some areas, Trans Mountain is looking at options that go beyond the current operational corridor. Alternate routes for the proposed expanded pipeline may be necessary — especially in areas where land use has changed since the pipeline was built nearly 60 years ago. The selection of the proposed pipeline corridor included both field and desktop assessments of the existing TMPL right-of-way and alternative routing locations that resulted in a proposed pipeline corridor. The proposed pipeline corridor will be designed and constructed in accordance with all applicable standards, and was chosen on the basis of minimal new disturbance and public impact. Where land use has changed since the pipeline went into operation in 1953, there may be a need to route parts of the new line away from the existing TMPL right-of-way. In these cases, Trans Mountain will look at alternatives through comprehensive routing studies in combination with its consultation process. To minimize effects to the urban landscape and landowners, the proposed route of the new pipeline would follow existing linear infrastructure to the extent practical, such as municipal streets or highway, railway or utility corridors, or in some cases parklands.	Volume 5B Sections 4.0, 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report
Municipal land use and development plans	In communities where routing may deviate from the existing TMPL right-of-way, Trans Mountain will discuss and apply routing considerations and decision-making criteria in discussions with local stakeholders. Trans Mountain will continue to engage and communicate with communities as new information becomes available. Trans Mountain will continue to contact landowners along the existing TMPL right-of-way, and when route alternatives are selected, Trans Mountain will work with landowners to identify mutually agreeable solutions to concerns. Trans Mountain will inform landowners and lessees of the route location and construction schedule to allow sufficient time to plan and implement alternative land use decisions. Particular attention will be paid to specialized agricultural production systems (*e.g.*, poultry, nursery or berry crop operations). Trans Mountain will locate and flag all existing buried utility lines and cables to be crossed by the pipeline prior to the commencement of ground disturbance activities by using "one call" services in addition to direct contact with utility owners. A discussion of routing principles and selection of the proposed pipeline corridor is provided in Section 4.0. Recreational areas, schools and hospitals are considered community assets that contribute to community way-of-life and are discussed under social and cultural well-being in Sections 5.3 and 7.2.3.	Volume 5B Sections 4.0, 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report
Golf course disruption, construction and remediation (Abbotsford)	Trans Mountain is evaluating ways to reduce the effects to the Ledgeview Golf Course and other golf courses potentially encountered along the proposed pipeline corridor. Golf courses are considered a community asset that contribute to community way-of-life and are discussed under social and cultural well-being in Sections 5.3 and 7.2.3.	Volume 5B Sections 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report

3.1.4.3 Infrastructure and Services

TABLE 3.1-5

INTERESTS OR CONCERNS RELATED TO INFRASTRUCTURE AND SERVICES

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Use of infrastructure and services by construction crews (*e.g.*, roads, hotels, food services) and potential effects	Trans Mountain recognizes that the Project is a major infrastructure project and, as such, the public will have an interest in the Project's scope, environmental assessment and routing. Trans Mountain has begun and will continue to engage in meaningful consultation with affected stakeholders regarding socio-economic effects and benefits. The Project's objective, where feasible, is to maximise local sourcing and content. This will be undertaken in discussion and engagement with local communities and businesses. Discussion on infrastructure and services is provided in Sections 5.5 and 7.2.5.	Volume 5B Sections 5.5 and 7.2.5 Volume 5D Socio-Economic Technical Report

TABLE 3.1-5 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Concern about inadequate power supply in North Thompson Valley	From initial discussions with BC Hydro, Trans Mountain understands that additional power infrastructure will be required in the North Thompson Valley. Trans Mountain is also aware some community residents have expressed concerns about the power supply in the North Thompson Valley and that BC Hydro has addressed the issue with local governments. By the end of 2013, BC Hydro will inform Trans Mountain of what infrastructure is required in the North Thompson Valley to supply the additional power while maintaining the public utility's existing customer service standards and commitments. It is anticipated the required infrastructure will be a combination of additions and upgrades to the current BC Hydro system, primarily within BC Hydro's existing rights-of-way. Trans Mountain is not participating directly in any major new power infrastructure projects in the North Thompson Valley. Linear infrastructure and power supply are addressed under infrastructure and services in Sections 5.5 and 7.2.5.	Volume 5B Sections 5.5 and 7.2.5 Volume 5D Socio-Economic Technical Report
Utility crossings Routing across roads and intersections	Where practical, the alignment of the proposed expansion route will parallel the existing TMPL. Trans Mountain recognizes that many regional changes have occurred since the pipeline was installed 60 years ago and that some routing decisions made today would be different. In some areas, Trans Mountain is looking at options that go beyond the current operational corridor. Alternate routes for the proposed expanded pipeline may be necessary — especially in areas where land use has changed since the pipeline was built nearly 60 years ago. The selection of the proposed pipeline corridor included both field and desktop assessments of the existing TMPL right-of-way and alternative routing locations, which resulted in a proposed pipeline corridor. The proposed pipeline corridor will be designed and constructed in accordance with all applicable standards. Where land use has changed since the pipeline went into operation in 1953, there may be a need to route parts of the new line away from the existing TMPL right-of-way. In these cases, Trans Mountain will look at alternatives through comprehensive routing studies in combination with its consultation process. To minimize effects to the urban landscape and landowners, the proposed route of the new pipeline would follow existing linear infrastructure to the extent practical, such as municipal streets or highway, railway or utility corridors, or in some cases parklands. In communities where routing may deviate from the existing TMPL right-of-way, Trans Mountain will discuss and apply routing considerations and decision-making criteria in discussions with local stakeholders. Trans Mountain will continue to engage and communicate with communities as new information becomes available. Trans Mountain will continue to contact landowners along the existing TMPL right-of-way, and when route alternatives are selected, Trans Mountain will work with landowners to identify mutually agreeable solutions to concerns. Trans Mountain will inform landowners and lessees of the route location and construction schedule to allow sufficient time to plan and implement alternative land use decisions. Particular attention will be paid to specialized agricultural production systems (*e.g.*, poultry, nursery or berry crop operations). Trans Mountain will locate and flag all existing buried utility lines and cables to be crossed by the pipeline prior to the commencement of ground disturbance activities by using "one call" services in addition to direct contact with utility owners. A discussion of routing principles and selection of the proposed pipeline corridor is provided in Section 4.0. Discussion on utility lines and roads is provided under infrastructure and services in Sections 5.5 and 7.2.5.	Volume 5B Sections 4.0, 5.5 and 7.2.5 Volume 5D Socio-Economic Technical Report

3.1.4.4 Employment and Economy

TABLE 3.1-6

INTERESTS OR CONCERNS RELATED TO EMPLOYMENT AND ECONOMY

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Concern about decreased property values near terminals Potential decreases in property values and marketability of houses near the right-of-way Private Land – loss of property value	Treating landowners, the people who have land agreements with Trans Mountain, and neighbours fairly and equitably is a cornerstone of the relationships Trans Mountain has developed and maintained in communities along the TMPL system. Through respectful dialogue, Trans Mountain's goal is to negotiate mutually-agreeable arrangements with each landowner who may be affected by the Project. In cases where Trans Mountain is unable to reach a mutually-agreeable arrangement, the NEB has a multi-step process that Trans Mountain will follow to address differences of opinions as part of the routing review and approval process. More information about the process is available on the NEB website (http://www.neb-one.gc.ca/clf-nsi/rthnb/pblcprtcptn/pplnrgltncnd/pplnrgltncnd-eng.pdf). Trans Mountain appreciates the concern about loss of property values and has been investigating potential effects upon properties for sale – both with and without easements. To date, Trans Mountain's investigation has not shown a measurable effect, however, this situation will continue to be monitored. Trans Mountain appreciates that most homes with the existing pipeline were built after the pipeline was in-place and the easement would have been disclosed to the buyer at that time. Looking ahead to the proposed new pipeline, under the *NEB Act*, companies are required to compensate landowners for any new easement and pay for any damages and inconvenience associated with the new pipeline. Included within the determination of compensation is any change in the value of the property before and after the pipeline was built. The effects of the Project on housing prices in general will not be worked through the assessment of employment and economy in Section 7.2.7. However, factors that may be of concern to residential property owners/occupants are considered in various parts of the ESA including noise (Section 7.2.6 Acoustic Environment of Volume 5A), air quality (Section 7.2.4 Air Emissions of Volume 5A), sensory/visual disturbance (Section 7.2.4 HORU) and community way-of-life (Section 7.2.3 Social and Cultural Well-being).	Volume 5A Sections 7.2.4 and 7.2.6 Volume 5B Sections 7.2.3, 7.2.4 and 7.2.7 Volume 5D Socio-Economic Technical Report
Increases in municipal taxes in Alberta	Municipalities that the pipeline will pass through will accrue property tax increases of approximately $1,583,000 annually in Alberta. The increase in municipal taxes is discussed under employment and economy in Section 7.2.7.	Volume 5B Section 7.2.7 Volume 5D Socio-Economic Technical Report
Increases in municipal taxes in BC What municipal taxes will expanded pipeline pay to City of Coquitlam	The Project is anticipated to generate substantial provincial and municipal tax revenue for BC. Over the life of the Project, it is estimated that the municipalities, counties/regional districts, and Indian Reserves crossed by the Project will accrue aggregate property tax increases of approximately $3.4 million annually in Alberta (a 116% increase over current Trans Mountain taxes paid) and approximately $23.2 million annually in BC (a 101% increase). The increase in municipal taxes is discussed under employment and economy in Section 7.2.7.	Volume 5B Section 7.2.7 Volume 5D Worker Expenditures Along the Pipeline Corridor Technical Report
Economic effects in the event of a spill Availability of insurance for landowners in the case of an oil spill	The cost of cleaning up an oil spill is difficult to estimate, as it depends on a variety of factors: • type of oil; • amount of oil; • spill location; • environmental effects; • socio-economic effects; • weather; • water conditions; • rate of spill; and • efficiency of response operations.	Volume 7

TABLE 3.1-6 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Economic effects in the event of a spill Availability of insurance for landowners in the case of an oil spill (cont'd)	Trans Mountain carries liability insurance to provide coverage for all aspects of spill management, including compensation and remediation. To ensure there are sufficient funds to remediate a spill, Trans Mountain is covered by the insurance necessary to respond to all spills or releases from pipelines and facilities. Trans Mountain monitors the insurance program continuously, and makes annual adjustments, as necessary, to ensure adequate coverage. As part of an ongoing commitment to safety and environmental protection, Trans Mountain takes responsibility for the clean-up and remediation of spills by responding immediately to any release from the pipeline system. Trans Mountain works with qualified and trained consultants and contractors to ensure any spill is cleaned up as quickly as possible while ensuring the safety of the public and minimizing effects to the environment. Although ultimately, liability for an oil spill depends on the cause of the spill, Trans Mountain will always initiate and cover costs for clean up and restoration. Depending on circumstances, Trans Mountain will then seek to recover costs from insurance or from a third party.	See above
Benefits to Canada as a whole and to communities/municipalities along the route (*e.g.*, Hope)	As the world's third-largest oil producer, Canada benefits greatly from the export of national resources. Twinning the TMPL will increase Canada's capacity to export these resources by facilitating the movement of oil to the west coast for marine transport to market. It will further secure the supply of oil products to the lower mainland for use by BC's residents and businesses. These items are further discussed in the Conference Board of Canada report called, the Trans Mountain Expansion Project: Understanding the Economic Benefits for Canada and its Regions Section (Volume 2). The Project will also lead to new jobs in the short and long-term, job-related training opportunities, and increases in taxes collected through all three levels of government. A discussion of the benefits of the Project to Canada is provided in detail in Volume 2 and summarized under employment and economy in Section 7.2.7. A discussion of the benefits to municipal economies is also provided under employment and economy in Section 7.2.7.	Volume 2 Trans Mountain Expansion Project: Understanding the Economic Benefits for Canada and its Regions Volume 5B Section 7.2.7 Volume 5D Worker Expenditures Along the Pipeline Corridor Technical Report Socio-Economic Technical Report
Awareness of the positive benefits of the Project What are the benefits for non-pipeline communities Economic benefits resulting from construction activities	Overall, the proposed expansion will enhance Canada's ability to reach diversified markets with its oil, while also increasing tax revenues that can be used to fund government projects and services Canadians depend on such as health care, education, roads and infrastructure. Trans Mountain plans to spend $5.4 billion by the end of 2017 to construct the line and associated facilities, and a further $2.4 billion to operate it for the first 20 years. BC's economy is forecast to grow by $2.8 billion (GDP) through construction-related spending, and up to $11.3 billion including Project operations through to 2037. The Project is also anticipated to generate substantial provincial and municipal tax revenue. Provincial governments' revenues associated with the Project are anticipated to be in the order of $1.7 billion, with BC provincial government receiving $1 billion in provincial taxes and Alberta receiving over $0.4 billion in provincial taxes. Municipal tax revenues that can support community services and infrastructure are estimated to increase approximately $23 million annually, or $460 million over 20 years of operations. In Alberta, municipal property taxes are estimated to increases approximately $3.4 million annually, or $68 million over 20 years of operations. In communities along the proposed pipeline corridor, annual property tax payments to more than 20 local governments and more than 24 Aboriginal communities would jump to $52.4 million from $25.9 million per year at present. The estimated tax revenues to the Government of Canada are $2.1 billion over the life of the Project. Construction is scheduled in 2016 and 2017 with an estimated 4,500 workers at peak manpower. Trans Mountain expects to create 108,000 person years of employment, from construction and the first 20 years of operations across Canada; of this, at least 66,000 person years of employment will be in BC and at least 25,000 will be in Alberta (related to direct project spending as well as supply chain effects and spending of wages). The proposed expanded operations are anticipated to create 40 new full-time permanent positions in Alberta and 50 new full-time permanent positions in BC. Economic benefits of the Project are discussed in detail in Volume 2 and are summarized under employment and economy in Section 7.2.7.	Volume 2 Volume 5B Section 7.2.7 Volume 5D Socio-Economic Technical Report

TABLE 3.1-6 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Use of local materials during construction	The Project will take active steps to maximize regional, Aboriginal, provincial and Canadian contracting and procurement, as outlined in its procurement policy and Aboriginal procurement policy. The Project will give first consideration to qualified regional suppliers of goods and services, where practical, and continue to engage with Aboriginal communities regarding regional Aboriginal businesses/contractors, including available business services and capacity. Contracts, service agreements and materials that are not deemed critical to sustain the Project will first be sought from regional resources. Some of the procurement opportunities that are more likely to be filled by regional suppliers include: water hauling; fuel supply; reclamation (*e.g.*, seeding, shrub planting); emergency medical services; security services; flag personnel; equipment rental and lease; gravel supply and hauling; worker accommodation and temporary housing; catering; and miscellaneous equipment supply (*e.g.*, generators, lighting towers, pumps).	Volume 5B Section 7.2.7 Volume 5D Socio-Economic Technical Report
Long-term employment opportunities in BC Effects to local business activity	Expanding the TMPL system will create both short and long-term job opportunities in BC communities along the proposed pipeline corridor and will contribute to an increase in tax revenue for the Province of BC and local governments. Construction is scheduled in 2016 and 2017 with an estimated 4,500 workers at peak manpower. Trans Mountain expects to create 108,000 person years of employment, from construction and the first 20 years of operations across Canada; of this at least 66,000 person years of employment will be in BC and at least 25,000 will be in Alberta (related to direct project spending as well as supply chain effects and spending of wages). In communities where construction activities concentrate, the economic impacts are significant. During the peak construction period of the TMEP and associated facilities, construction hubs are to be established along the route for the staging of work and accommodation of workers. Construction workers residing in construction hub communities will spend dollars on accommodation, meals and other goods and services which will create spin-off benefits for local businesses and economies. Trans Mountain anticipates a large number of the total construction workforce will come from the communities directly along the corridor, including nine communities in BC, particularly in larger communities where up to 30 percent of the workforce is estimated to be local hires. The proposed expanded operations are anticipated to create approximately 50 new full-time permanent positions in BC. Long-term employment as well as potential effects of the Project on local businesses is discussed under employment and economy in Sections 5.7 and 7.2.7.	Volume 5B Sections 5.7 and 7.2.7 Volume 5D Socio-Economic Technical Report
How will Trans Mountain work with trade schools on skills development?	Trans Mountain is exploring opportunities to provide and support education and training initiatives for Aboriginal communities along the proposed pipeline corridor, and has begun dialogue with local training institutions. Education and training for Aboriginal communities in areas such as trades, maintenance, operations and environmental management will enhance the capacity of the local labour force to participate in Project opportunities. This will also build transferrable skills that can be used across other industries, and enhance the overall community capacity. The enhancement of training opportunities is discussed under employment and economy in Sections 5.7 and 7.2.7.	Volume 5B Sections 5.7 and 7.2.7 Volume 5D Socio-Economic Technical Report

3.1.4.5 Community Health

TABLE 3.1-7

INTERESTS OR CONCERNS RELATED TO COMMUNITY HEALTH

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
An influx of temporary workers into a community and the effects on health and health care services	Trans Mountain recognizes that the construction of the Project will require a large workforce and may exert an influence on health in nearby communities. The effects of an influx in temporary workers would primarily manifest in those communities acting as a construction hub for construction workers and in particular, those communities that have relatively small resident populations compared to the size of the temporary Project workforce. Engagement will be ongoing as the Project Team continues its detailed design of the Project. The influx of workers into communities and the potential effects on community health as it relates to socio-economic health effects and health care service provision are provided in Sections 5.8 and 7.2.8.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report

3.1.4.6 Human Health

TABLE 3.1-8

INTERESTS OR CONCERNS RELATED TO HUMAN HEALTH

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Health effects of airborne chemicals	Working openly and co-operatively with all levels of government, Aboriginal communities and stakeholders, Trans Mountain is committed to minimizing effects to the local environment, health, and community. A screening level human health risk assessment was initiated for the Project to assess potential effects of pipeline operations on human health. A human health risk assessment will be submitted to the NEB in Q2 2014. Potential human health effects are discussed in Sections 6.0 and 7.5.8.	Volume 5B Sections 6.0 and 7.5.8 Volume 5D Screening Level Human Health Risk Assessment of Pipeline and Facilities
Health effects from odors at Sumas Terminal	New prevention and community notification measures have been established in response to the release of oil at the Trans Mountain storage facility in Abbotsford. On January 24, 2012, oil from a storage tank at the Sumas Terminal spilled and was fully contained within a bermed area on the property that was lined with an impermeable membrane. The containment worked as designed, and all of the oil was recovered on the same day as the release. It was later determined that damage caused by freezing of the internal roof drain system caused the spill. Odors were reported in the area, which caused concern in the community. As a result, Trans Mountain has taken a number of steps to improve air quality monitoring and its process for communicating with local residents. Steps include the following. • Enhanced Odor Complaints and Investigation Process – Taking steps to minimize odors and investigate their cause is a top priority. Odors can be reported to 1-888-876-6711 around the clock. All odor reports will be thoroughly investigated and addressed. As a result of the January incident, additional measures will include notification of the local fire department dispatch. • Air Quality Monitoring and Reporting – An air monitoring station will be installed at the Sumas Terminal by the end of this year and an independent, rapid response service provider will conduct air monitoring sampling and analysis if needed in the event of an incident. In addition to the measures to improve air quality monitoring and notification processes, the drain system – found to be the cause of the incident – has been repaired and tested. Procedures have been put in place to prevent a similar incident. Later this fall, a heating system will be installed on the valves at each of the six tanks at the Sumas Terminal to prevent potential freezing during the winter.	Volume 5B Sections 6.0 and 7.5.8 Volume 5D Screening Level Human Health Risk Assessment of Pipeline and Facilities

TABLE 3.1-8 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Concern that residents are dealing with ongoing residual effects of 2012 spill (odors) re: Sumas Terminal Potential increase in odors with increase in tankers and/or tank farms	When crude oil arrives at the Sumas Terminal through the TMPL, it is held temporarily in storage tanks before being shipped to its next destination. Since the crude contains sulphur compounds, often described as having a rotten-egg smell, moving oil into and out of the tanks can cause nuisance odors near the terminal. Petroleum odors can be a nuisance for Trans Mountain's neighbours, and can sometimes also signal a problem with operations. Since safe operations and protection of the environment are always top of mind in this line of work, Trans Mountain investigates and follows up on all odor reports. Continuous air monitoring equipment has been installed at the Sumas Terminal and a new air monitoring program has been implemented for monitoring petroleum vapour concentrations in local neighbourhoods in the event of an incident. Additionally, the drain system – found to be the cause of the spill – has been repaired and tested. Procedures have been put in place to prevent a similar incident. These include: • the installation of a heating system on the external roof drain system valves to prevent potential freezing; and • all drainage valves are now maintained in the closed position when the drainage system is not in use. Finally, changes were made in the control centre process to initiate immediate field response for any observed deviations in tank volume. A tank level monitoring device has been designed to improve the accuracy of tank level changes and minimize false alarms. Trans Mountain strives to minimize the effects of its operations on their neighbors by incorporating odor mitigation measures in its day-to-day activities and project work. In addition, Trans Mountain is taking steps to enhance its early leak detection system and air monitoring/sampling protocol. Trans Mountain is also looking into procuring technology to facilitate automated calls to residents in the area in the event of an emergency and will provide more information on this initiative to local area residents.	Volume 5B Sections 6.0 and 7.5.8 Volume 5D Screening Level Human Health Risk Assessment of Pipeline and Facilities
What are the human health effects from odors, and pipeline products? Is there a carcinogenic link? Risk of carcinogenic effects from products in pipeline	There are no known carcinogenic health related risks related to products within the pipeline. In support of the ESA for the Project, Trans Mountain has commissioned a Human Health Risk Assessment (HHRA), the principal aim of which is to identify and understand the potential short-term and long-term health risks, including carcinogenic risks, to people exposed to the chemicals that could be released to the environment from the pipeline and associated facilities.	Volume 5B Sections 6.0 and 7.5.8 Volume 5D Screening Level Human Health Risk Assessment of Pipeline and Facilities

3.1.4.7 Traditional Land and Resource Use

TABLE 3.1-9

INTERESTS OR CONCERNS RELATED TO TRADITIONAL LAND AND RESOURCE USE

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Effects to traditional lands and disruption of pristine forests, Raft River crossing	As a long-time industry and community member, Trans Mountain is committed to working with Aboriginal and local communities, residents, regulatory authorities and other stakeholders on environmental initiatives. Trans Mountain helped stabilize the Raft River near the existing TMPL right-of-way in Clearwater, BC. This enhancement project involved stabilizing more than 700 m of river bank to prevent erosion, improving the local fish habitat, as well as planting native trees and shrubs. When Trans Mountain was seeking certification through the Wildlife Habitat Council, work began with a landowner on the existing TMPL right-of-way who was interested in being involved. Trans Mountain determined ways to improve the landowner's property to provide a more hospitable environment for local species. A discussion of traditional land and resource use is provided in Sections 5.2 and 7.2.2.	Volume 5B Sections 5.2 and 7.2.2 Volume 5D Traditional Land and Resource Use Technical Report

Additional concerns raised regarding traditional land and resource use can be found in Section 3.2, Aboriginal Engagement, which provides a comprehensive list of consultation conducted and a summary of interests and concerns.

3.1.4.8 Consultation Activities with Federal and Provincial Authorities

Specific disciplines consulted with federal, provincial, regional and municipal regulatory authorities throughout the proposed pipeline corridor. For each socio-economic element, a summary table provides detailed information on the agency contacted, name and title of contact, method of contact, date of engagement, reason for engagement, key interests and concerns as well as any commitments or follow-up actions required.

Heritage Resources

TABLE 3.1-10

SUMMARY OF CONSULTATION ACTIVITIES FOR HERITAGE RESOURCES

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/ Follow-Up Actions/ Comments	Where Issue is Addressed in the Application
PROVINCIAL CONSULTATION - ALBERTA							
Alberta Culture	OPAC	Email	November 24, 2012	Application for *Historical Resources Act* Clearance - Application No. 003203756	Review of the application for *Historical Resources Act* clearance has completed.	Signed Clearance Application HRM File: 4780-12-0066 Schedule "A" Project File: 4780-12-0066	Volume 5B Sections 5.1 and 7.2.1
Alberta Culture	OPAC	Email	March 18, 2013	Application for Archaeological Permit	Application has been received and review of application initiated.	Application Re: 7894 Application No 003104602 Revision No 2 Original Submission Date: September 24, 2012	Volume 5B Sections 5.1 and 7.2.1
Alberta Culture	OPAC	Email	March 23, 2013	Application for Archaeological Mitigative Permit - Application No 003104602	An approved Archaeological Research Permit was received.	Archaeological Permit No. 13-018	Volume 5B Sections 5.1 and 7.2.1
Alberta Culture	Caroline Hudecek-Cuffe (Archaeologist)	Email	May 24, 2013	Requesting Approval for Methodology Changes to Permit No. 13-018	Approval of changes to the original methodologies for Permit No. 13-018 to include the use of multiple crews in the assessment of the Project Study Area Corridor, and to incorporate geotechnical borehole testing into the testing methodology.	Archaeological Permit No. 13-018	Volume 5B Sections 5.1 and 7.2.1
Alberta Culture	OPAC	Email	June 4, 2013 to June 18, 2013	Application for *Historical Resources Act* Clearance - Application No. 003988910	Application for *Historical Resources Act* clearance has been received and review of the application has been initiated and completed.	Application No : 003988910, Revision No : 02 Original Submission Date: June 10, 2013	Volume 5B Sections 5.1 and 7.2.1
Alberta Culture	Pauline Bodevin (Heritage Resource Management Planning Assistant)	Email	November 1, 2012	Clarification of project shapefile	Request for clarification of size and location of study corridor.	TMEP	Volume 5B Sections 5.1 and 7.2.1
PROVINCIAL CONSULTATION – BRITISH COLUMBIA							
Archaeology Branch	Ewan Anderson	Email	June 13, 2012	Mapping Requirements	Received detailed list of mapping requirements from BC portion of the TMEP line	Application File: 11200-30/12A0290	Volume 5B Sections 5.1 and 7.2.1

TABLE 3.1-10 Cont'd

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/ Follow-Up Actions/ Comments	Where Issue is Addressed in the Application
Archaeology Branch	Ewan Anderson	Email	July 23, 2010	Request regarding Heritage Inspection Permit Application	Request that Ewan Anderson to review this Permit Application as the Project Officer.	Permit Application No. 11200-30/12A0290	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Ewan Anderson	Email	July 23, 2010	Request regarding Heritage Inspection Permit Application	Request that Ewan Anderson to review this Permit Application as the Project Officer.	Permit Application No. 11200-30/12A0290	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Jim Spafford (Project Officer)	Email, phone	August 7, 2012 to July 24, 2013	Submission of project shapefile, permit application 12A0290/13A0290 and feedback, Archaeological Permit 2013-0165, permit amendment	Initial permit application, shapefiles and feedback for permit application, addressing Aboriginal community concerns with regards to Permit Application 12A0290/13A0290, issue of Archaeological Permit 2013-0165, formal request that the following condition be added to Permit 2013-0165.20: In areas to be surveyed employing 100% coverage of proposed line and ancillary developments, for which all concerned Aboriginal communities have been contacted with respect to the scheduling of fieldwork and personnel, a map indicating areas of archaeological potential will not be required 15 days before the initiation of field work. Advised the permit holder that Condition 18 does not apply if the permit holder has advised an Aboriginal Community that 100% of the proposed development area within their consultative area will be inspected. In such cases, it will be sufficient to notify that First Nation of the scheduling of proposed field work within their consultative area at least 10 days before field work is initiated. Documentation of the relevant communications with the First Nation must be provided to the Archaeology Branch, upon request.	Permit Application No. 11200-30/12A0290 Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Al Makie (Heritage Resource Specialist)	Email	April 11, 2013	Permit Application	Permit Application Review v2.	Application Review 12AO290	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Doug Glaum (Manager, Archaeology Branch)	Email	July 5, 2013	Permit Application:12A0290/13A0290 (TMEP) Status	Confirmation that Archaeological Permit 2013-0165 has been issued.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1

TABLE 3.1-10 Cont'd

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/ Follow-Up Actions/ Comments	Where Issue is Addressed in the Application
AMEC Environment and Infrastructure	Diana Alexander (Archaeology Group Lead and Senior Archaeologist)	Email	July 5, 2013	Permit 2013-0165 Issue	AMEC sending Archaeological Permit 2013-0165 and the Branch's response to Aboriginal communities' letters and the permit application they sent to Aboriginal communities. The Branch requires that a map of areas to be field inspected is provided to Aboriginal communities 15 days in advance.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1
AMEC Environment and Infrastructure	Ian Franck (Project Manager and Senior Archaeologist)	Email	July 22, 2013	NTA Response to Permit Application: 12A0290/13A0290	Distribution of NTA's response to the Permit Application: 12A0290/13A0290, and their request to be involved in the Project.	Permit Application:12A0290/ 13A0290	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Eric Forgeng (Project Officer)	Email	August 30, 2013	Suggested Edits to Aboriginal Consultative List	Suggested edits to the original permit regarding Aboriginal Consultative List to include Adams Lake, Canim Lake, Hulquminum Treaty Group [core area] and six member nations: Stz'uminus, Cowichan, Lake Cowichan, Hahalt, Lyackson and Penelakut.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Eric Forgeng (Project Officer)	Email	September 4, 2013	TMPL Centre lines for Application 11200-3012A0290	Request for project GIS centre line for Application 11200-3012A0290.	Application No. : 11200-30/12A0290	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Eric Forgeng (Project Officer)	Email	September 12, 2013	Permit Amendment Request No. 2	Email chain between Eric Forgeng and Aaron Osicki discussing Amendment request to Permit 2013-0165 to amend route skirting the Coldwater Reserve near Merritt. Also a request for shapefiles for only the re-route segment of the TMEP line.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1
AMEC Environment and Infrastructure	Ian Franck (Project Manager and Senior Archaeologist)	Email	October 24, 2013	Permit Amendment No. 1	Permit amendment indicating that the TMEP will exclude the Coldwater Reserve.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Eric Forgeng (Project Officer)	Email	November 4, 2013	Discussion regarding Consultative Area Boundaries	Eric Forgeng initiated conversation with Aaron Osicki and Ian Franck regarding Simpcw First Nation issue of involving Adams Lake Indian Band on TMEP pipeline right-of-way south of RK 594.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1
Archaeology Branch	Eric Forgeng (Project Officer)	Email	November 26, 2013	Permit Amendment Request No. 3	The amendment focuses on the request of several First Nations Communities to use repositories other than the RBCM for artifacts and samples collected within their traditional territories.	Archaeological Permit 2013-0165	Volume 5B Sections 5.1 and 7.2.1

TABLE 3.1-11

SUMMARY OF CONSULTATION ACTIVITIES FOR SOCIAL AND CULTURAL WELL-BEING, HUMAN OCCUPANCY AND RESOURCE USE, INFRASTRUCTURE AND SERVICES, NAVIGATION AND NAVIGATION SAFETY, AND EMPLOYMENT AND ECONOMY ELEMENTS

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
FEDERAL CONSULTATION							
Port Metro Vancouver (PMV)	Jennifer Natland, Manager Development Strategies Sarah McPherson, Manager Project Communications Carrie Brown, Manager Environmental Programs	Meeting	April 9, 2013	Project and ESA review. Overview of Socio-Economic Assessment. RSA boundaries. Marine commercial, recreational and tourism use data collection and issues scoping.	Project providing additional community investments. Would like application to be logically structured so it is easy to find all sections pertinent to PMV. Methodology for analysis of economic benefits of tanker traffic is logical. Clarification of the RSA for marine commercial, recreational and tourism use related to the Westridge Marine Terminal assessment and tanker traffic assessment.	Follow-up with PMV, as required, as the Project proceeds.	Volume 5B Sections 7.6.4 and 7.6.5 Volume 5D Socio-Economic Technical Report Volume 8A Section 4.3.11
PMV	Jennifer Natland, Manager Development Strategies	Email correspondence	July 12 to 16, 2013	Project and ESA overview. Questions about marine use in PMV: anchorage regulations, small vessel numbers, log handling activities, recreational waterfront management.	Requested to remain informed as the Project proceeds.	Follow-up with PMV, as required, as the Project proceeds.	N/A
Royal Canadian Mounted Police (RCMP), Hope Community Policing Office	Constable Lara Davidsen	Meeting	July 2, 2013	Project introduction. Overview of Socio-Economic Assessment. Social and Cultural Well-being data collection and issues scoping.	Suggested any camps be alcohol and drug free.	Follow-up with RCMP, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.8 Volume 5D Socio-Economic Technical Report
RCMP, Upper Fraser Valley Regional Detachment	Superintendent Deanne Burleigh Inspector Grant Wilson Staff Sergeant Jim Simmill	Meeting	July 3, 2013	Project introduction. Overview of Socio-Economic Assessment. Social and Cultural Well-being and Infrastructure and Services data collection and issues scoping.	Historical incidents of theft at staging areas. Potential protests. Off-duty activities of workers.	Follow-up with RCMP, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.8 Volume 5D Socio-Economic Technical Report
RCMP, Edson Community Policing Office	Constable Bruce Chomeakwich	Meeting	July 18, 2013	Project introduction. Overview of Socio-Economic Assessment. Social and Cultural Well-being data collection and issues scoping.	No issues with work crews other than small noise/nuisance complaints. Workers come into town to drink. More skilled workers are less problematic than entry-level workers.	Follow-up with RCMP, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.8 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
RCMP, Hinton Community Policing Office	Corporal Danny Knight	Meeting	July 19, 2013	Project introduction. Overview of Socio-Economic Assessment. Social and Cultural Well-being data collection and issues scoping.	Housing capacity will be an issue. Increase in bar fights and impaired driving. Suggested a dry camp. Construction noise can be an issue. RCMP is first responder to worksite issues, which can take up RCMP resources.	Follow-up with RCMP, as required, as the Project proceeds.	Volume 5B Sections 7.2.3. 7.2.4 and 7.2.8 Volume 5D Socio-Economic Technical Report
RCMP, Division 'E' (Surrey, BC)	Unnamed member of RCMP	Phone (attempt)	June 19, 2013	Project introduction. Overview of Socio-Economic Assessment. Social and Cultural Well-being data collection and issues scoping for Metro Vancouver region.	Suggested contact RCMP Media Relations; requested call back.	Follow-up with RCMP, as required, as the Project proceeds.	N/A
PROVINCIAL CONSULTATION - ALBERTA							
Alberta Environment and Sustainable Resource Development (AESRD) - Foothills Area	Sharad Karmacharya, Land Management Planner	Meeting	October 18, 2012	Project introduction. Overview of Socio-Economic Assessment. Land and resource use data collection and issues scoping.	No concerns with RSA boundaries presented. Construction of the Project should not negatively impact the development of commercial recreational tourism in the area proposed in the forthcoming area structure plan. Project will need to have stringent reclamation plans that are on par with end land use goals for each specific area.	Follow-up with AESRD, as required, as the Project proceeds.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report
Alberta Transportation	Mark Svenson, Environmental Coordinator	Phone Call, Email	July 11, 2013	Overview of Socio-Economic Assessment. Highway infrastructure capacity.	No issues identified. Requested that the Socio-economic team send an email with specific questions and information needs.	Socio-economic team sent email with information needs. Did not receive a response.	N/A
PROVINCIAL CONSULTATION – BRITISH COLUMBIA							
Tourism BC	Krista Morten, Manager, Policy and Legislation Carol Jenkins, Senior Tourism Development Officer	Meeting	September 25, 2012	Project introduction. Overview of Socio-Economic Assessment. RSA boundaries. Land and resource use data collection and issues scoping.	Consultation with tenure holders and tourism operators is important. Discussions with BC Parks should occur. Tourism businesses that support tenured operators. Tenured operators. Viewsheds. Noise pollution. Light pollution. Water quality. General perception of BC as a tourism destination. Competing land uses.	Follow-up with Tourism BC, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.4 Volume 5D Socio-Economic Technical Report Volume 8A Section 4.3.11

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
BC Ministry of Forest, Lands and Natural Resource Operations (BC MFLNRO), Thompson Okanagan Region	Peter Lishman, Director, Resource Authorizations Megan Williams, Senior Natural Resource Officer Alan Hicks, Project Manager, Authorizations John McQueen, First Nations Relations Manager Noelle Kekula, Recreation Officer Robyn Reudink, Ecosystems Biologist	Meeting	October 31, 2012	Project introduction. Overview of Socio-Economic Assessment. RSA boundaries. Land and resource use data collection and issues scoping.	Messaging regarding off-highway vehicle use on utility corridors. Minimizing disturbance to native grasses and successful restoration, particularly in Lac du Bois Protected Area. Any restriction to forestry is an issue. Cumulative effects regarding caribou migration and fish.	Follow-up with BC MFNLRO, Thompson Okanagan Region, as required, as the Project proceeds.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report
BC MFLNRO, South Coast Region	Alec Drysdale, Director, Resource Authorizations Allan Johnsrude, District Manager, Resource Operations, Chilliwack	Meeting	November 16, 2012	Project introduction. Overview of Socio-Economic Assessment. RSA boundaries. Land and resource use data collection and issues scoping.	No concerns with RSA boundaries presented. RSA should consider visual impact, access and impact to other businesses/users. Most interest is in areas where the proposed route deviates from the existing right-of-way.	Follow-up with BC MFNLRO, South Coast Region, as required, as the Project proceeds.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report
BC Ministry of Children and Family Development (MCFD)	Bev (surname unknown), Coast Fraser Surrey Office	Phone	June 19, 2013	Project introduction. Overview of Socio-Economic Assessment. Social and cultural well-being data collection and issues scoping.	BC MCFD suggested TERA speak with members of the public to understand potential social impacts. BC MCFD chose to refrain from discussing the Project.	None.	Volume 5B Section 7.2.3 Volume 5D Socio-Economic Technical Report
BC Ministry of Transportation and Infrastructure (MOTI), South Coast Region	Brian Atkins, Lower Mainland District Manager, Transportation Mike Kelly, Operations Manager Roanna Cruz, Senior District Development Technician	Meeting	June 24, 2013	Overview of Socio-Economic Assessment. Highway infrastructure capacity.	No concerns from a socio-economic perspective. BC MOTI requires more detailed information to provide feedback on specific issues. A comprehensive Traffic Management Plan was strongly encouraged.	None.	Volume 5B Section 7.2.5 Volume 5D Socio-Economic Technical Report
BC MFLNRO, Chilliwack District	Allan Johnsrude, District Manager, Resource Operations, Chilliwack Mike Peters, Recreation Officer	Meeting	July 3, 2013	Overview of Socio-Economic Assessment. RSA boundaries. Land and resource use data collection and issues scoping.	No concerns with RSA boundaries presented. Most interest is in areas where the proposed route deviates from the existing right-of-way; concerns regarding access. Any restriction to forestry and other industry is an issue. Heavy undesignated recreational use between the old toll booth on the Coquihalla Highway and Hope.	Follow-up with BC MFNLRO, Chilliwack, as required, as the Project proceeds.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report
BC MOTI, South Coast Region	Edison Ting, Area Development and Operations Technician	Email	July 2013	BC highways inventory report.	None identified.	None.	N/A

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
MUNICIPAL CONSULTATION – ALBERTA							
Village of Wabamun	Linda Hannah, Chief Administrative Officer (CAO)	Meeting	October 9, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Sensitive since the CN rail spill (2005). Lake Wabamun, issues regarding water quality and recreational activities such as fishing and sailing. Open, transparent and easily understood and available information is important. Winter construction is preferred. Concern surrounding disruption to road access; boring roads is preferred over open cut. Aging infrastructure.	Follow-up with the Village of Wabamun, as required, as the Project proceeds.	Volume 5A Section 7.2.3 Volume 5B Section 7.2.3 Volume 5D Socio-Economic Technical Report
City of Spruce Grove	Debra Irving, Director of Planning and Development Jeff Mustard, Director of Engineering Lindsey Butterfield, Long Range Planner	Meeting	October 10, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Prefer Project to go south along existing linear disturbances such as the planned Highway 628. Wetlands/peat lands.	Follow-up with the City of Spruce Grove, as required, as the Project proceeds.	Volume 5A Section 7.2.8 Volume 5B Section 7.2.5 Volume 5D Socio-Economic Technical Report
Town of Stony Plain	Louise Frostad, Finance and Administration Matthew Clause	Meeting, Email, Phone Call	October 2012 to March 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Sensitivity regarding oil spills has grown since the 2005 CN rail spill. Environmentally conscious community. Not opposed a camp as long as it is not within the town limits.	Follow-up with the Town of Stony Plain, as required, as the Project proceeds.	Volume 5B Section 7.2.3 Volume 5D Socio-Economic Technical Report
Strathcona County	Lori Mills, Energy Exploration Liaison	Email	October 16, 2012 to July 15, 2013	Given feedback from certain communities, the socio-economic team postponed meetings in the area until a better understanding of routing has been reached.	N/A	Follow-up with Strathcona County, as required, as the Project proceeds.	N/A
		Meeting	July 15, 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Construction could be an issue for residents because of noise and traffic. Cumulatively the Project overlaps with a number of other projects in the area.		Volume 5B Sections 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
Parkland County	Pat Vincent, CAO	Email	October 16, 2012	Given feedback from certain communities, the socio-economic team postponed meetings in the area until a better understanding of routing has been reached.	N/A	Follow-up with Parkland County, as required, as the Project proceeds.	N/A
	Paul Hanlan, Manager of Planning and Development Ken Van Buul, General Manager, Community Services	Meeting	July 17, 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Identified commercial recreation businesses on the Pembina River. Any activity that affects Highway 16 may restrict access in the county. Winter is the preferred construction period. Fire services are at capacity. Vehicle accidents are an issue; any temporary increase in traffic may be an issue.		Volume 5B Sections 7.2.4 and 7.2. Volume 5D Socio-Economic Technical Report
Yellowhead County	Jack Ramme, CAO Barb Lyons, Director of Corporate & Planning Services	Meeting	October 17, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	RCMP capacity. Overlap with proposed Coalspur Mines Ltd. Vista Coal Mine Project. Lack of skilled labour. Positive tax benefits.	Follow-up with Yellowhead County, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.5 and 7.2.7 Volume 5D Socio-Economic Technical Report
Town of Edson	Brigitt Lemieux, Assistant CAO	Meeting, Email	October 2012 to March 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Do not follow existing easement, instead go south of municipality. Reduce risk from a spill/incident close to residents. New residential development (Hillendale Phase II) very near the existing route. Lack of skilled labour. Trans Mountain should partner with local organizations. Use route as recreation corridor. Positive tax benefits.	Follow-up with the Town of Edson, as required, as the Project proceeds.	Volume 5B Sections 7.2.4 and 7.2.7 Volume 5D Socio-Economic Technical Report
Town of Hinton	Bernie Kreiner, Town Manager	Meeting Email	October 2012 to March 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Routing through east, residential areas. Ensure emergency management is practiced with Trans Mountain. Trans Mountain should partner with local organizations. Use route as recreation corridor. Overlap with proposed Coalspur Mines Ltd. Vista Coal Mine Project. Positive tax benefits.	Follow-up with the Town of Hinton, as required, as the Project proceeds.	Volume 5B Sections 7.2.4, 7.2.5 and 7.2.7 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
City of Edmonton	Simon Farbrother, City Manager Gord Jackson, Director Policy Section- Sustainable Development Department	Email	October 18, 2012	Given feedback from certain communities, the socio-economic team postponed meetings in the area until a better understanding of routing has been reached.	None identified.	No follow-up required. Given the level of broader Project engagement with the City of Edmonton and feedback from the city, the socio-economic team did not meet with the city.	N/A
Municipality of Jasper	Peter Waterworth, CAO Cathy Jenkins, Manager Municipal and Realty Services-Parks Canada B. Christopher Read, Inspiration Manager (Recreation) Don Pickle, Infrastructure Manager Thea Mitchell, Environmental Assessment Specialist-Parks Canada Mabaye Dia, Environmental Assessment-Parks Canada Jurgen Deagle, Environmental Management Specialist-Parks Canada	Meeting	October 19, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Housing market. Local contract procurement. No interference with transfer station access. Overlap with proposed Coalspur Mines Ltd. Vista Coal Mine Project near the Town of Hinton. Increased rail traffic. Environmentally conscious community. Labour shortage in services industries.	Follow-up with the Municipality of Jasper, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.5 and 7.2.7 Volume 5D Socio-Economic Technical Report
Family and Community Support Services - Spruce Grove	Lorraine Berry, Supervisor Amber Nicol, Sustainability Planner, City of Spruce Grove	Phone, Meeting	July 17, 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Social and cultural well-being data collection and issues scoping.	Housing limitations with no available rentals in the City of Spruce Grove. Disconnection from families can cause temporary workers to be susceptible to mental health and addiction issues. Limited capacity for waste management.	Follow-up with Family and Community Support Services - Spruce Grove, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.5 Volume 5D Socio-Economic Technical Report
Edson Community Services	Mike Butler, Director	Meeting	July 18, 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Social and cultural well-being data collection and issues scoping.	Impacts to municipal trails. Some concern regarding influx of workers. Could be a strain on infrastructure depending on number of workers and where they are housed. Effects to Vision Park.	None.	Volume 5B Sections 7.2.3, 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report
Hinton Community and Protective Services Division	Don Engerdahl, Arts and Culture Coordinator	Meeting	July 19, 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Social and cultural well-being data collection and issues scoping.	Importance of working with local employment agencies. Potential effects to the local trail system. In past project, locals have been displaced due to construction crews.	None.	Volume 5B Sections 7.2.3, 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
MUNICIPAL CONSULTATION – BRITISH COLUMBIA							
Tourism Industry Association of British Columbia (TIABC)	Lana Denoni, Chair	Meeting	September 25, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Early and open consultation is important. Incremental increase of tankers is important to discuss.	Follow-up with TIABC, as required, as the Project proceeds.	Volume 5D Socio-Economic Technical Report Volume 8A Section 4.3.11
City of Kamloops	Jen Fretz, Sustainability and Environmental Services Manager Marvin Kwiatkowski, Development and Engineering Services Director Randy Lambright, Planning and Development Manager Mike Doll, Parks Planning Supervisor	Meeting	October 29, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Routing through the Westsyde neighbourhood. South Thompson River crossing. Overlap with Ajax Mine. Disruption of single access roads.	Follow-up with the City of Kamloops, as required, as the Project proceeds.	Volume 5B Sections 7.2.4, 7.2.5 and 7.2.6 Volume 5D Socio-Economic Technical Report
Thompson-Nicola Regional District (TNRD)	Sukh Gill, CAO Ron Storie, Manager of Community Services Regina Sadilkova, Director of Development Services Peter Hughes, Director of Environmental Services	Meeting	October 29, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Timing and location of the proposed route in relation to services, infrastructure and parks planned. Providing access to land users. Proximity of proposed route to the Little Fort cemetery.	Follow-up with the TNRD, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.4 Volume 5D Socio-Economic Technical Report
Tourism Kamloops	Lee Morris, Chief Executive Officer	Meeting	October 29, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Lac du Bois Grasslands Protected Area. Alteration of viewscapes. Reputation and public perception in the event of a spill.	Follow-up with the Tourism Kamloops, as required, as the Project proceeds.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report Volume 7

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Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
City of Merritt	Susan Roline, Mayor Matt Noble, CAO Pat Sibilleau, Manager of Financial Services James Umpherson, Business and Economic Development Manager Sean O'Flaherty, Development Services Officer	Meeting, Email	October 2012 to March 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Conflicting land use regarding the existing right-of-way and the Merritt Airport. Ability to run services (such as water) to a work camp. Opportunities for local businesses. Preference of a pipeline over trucking oil.	Follow up with the City of Merritt, as required, as the Project proceeds.	Volume 5B Sections 7.2.4, 7.2.5 and 7.2.7 Volume 5D Socio-Economic Technical Report
Community Futures Nicola Valley	Jean Perog, Chair, Governance and Board Development David Brown, Lending Committee Member	Meeting	October 30, 2012	Project introduction. Overview of ESA Approach. Employment and economy data collections and issues scoping.	Merritt has areas for temporary housing. Watershed Use and Management Program (WUMP), a subset of Nicola Valley Watershed is an active group in the areas.	Follow-up with Community Futures Nicola Valley, as required, as the Project proceeds.	Volume 5B Section 7.2.5 Volume 5D Socio-Economic Technical Report
Venture Kamloops	Anita Grover, Manager, Economic Development	Meeting	October 31, 2012	Project introduction. Overview of ESA Approach. Employment and economy data collection and scoping.	Kamloops is an environmentally sensitive community. Home builders association, construction association and BC Bid are best ways to communicate procurement contracts with local companies. Venture Kamloops is very proactive for labour in the community.	Follow-up with the Venture Kamloops, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.7 Volume 5D Socio-Economic Technical Report
Mike Wiegele Helicopter Skiing	Mike Wiegele, Owner Michelle Wiegele, President	Meeting	November 6, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Routing through the property. Disruption of summer business. Potential for housing workers during summer construction.	Follow-up with Mike Wiegele Helicopter Skiing, as required, as the Project proceeds.	Volume 5B Sections 7.2.4, 7.2.5 and 7.2.7 Volume 5D Socio-Economic Technical Report
Valemount Chamber of Commerce	Tammy VandeNobelen, Chair Jeanette Townsend, Vice Chair Marie Birkbeck, Secretary-Treasurer	Meeting	November 6, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Social well-being of the community, with reference to the potential for escort services during the TMX Anchor Loop Project. Housing during the winter. Valemount's entrepreneurial spirit and the community's interest in the Project.	Follow-up with the Valemount Chamber of Commerce, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.5 and 7.2.7 Volume 5D Socio-Economic Technical Report

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Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
Valemount Area Recreation Development Association (VARDA)	Curtis Pawliuk	Meeting	November 6, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Disruption of winter recreational activities. Negative occurrence during the TMX Anchor Loop Project: destruction of a wetland by non-local crews using ATVs. Interest in educating crews regarding recreational opportunities. Summer use of snowmobile trails. Right-of-way recreational use requests.	Follow-up with VARDA, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.4 Volume 5D Socio-Economic Technical Report
Village of Valemount	Andru McCracken, Mayor Anne Yanciw, CAO Silvio Gislimberti, Economic Development Officer Sandy Salt, Councillor Victor LaBoucane, Public Works Superintendent Christine Latimer, Councillor	Meeting	November 6, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Invasive species along right-of-way. Limited housing capacity. Any full-time employment would be positive for the community. Food for crews (currently only one grocery store). Swift Creek crossing.	Follow-up with the Village of Valemount, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.5 and 7.2.6 Volume 5D Socio-Economic Technical Report
Village of Valemount	Anne Yanciw, CAO	Phone call	July 11, 2013	Social and health discussion.	Issues encountered during construction of TMX Anchor Loop Project: food availability at grocery stores, lack of consideration for outdoor spaces, social concerns, parking and housing.	Ms. Yanciw may try to arrange another phone call with other local police and social service providers. Follow-up with the Village of Valemount, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report
TNRD	Willow Macdonald, Director, Electoral Area "B" (Thompson Headwaters)	Open House	November 6, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Concern regarding drug use. Communication of construction timing to the community is important. Winter is the busy tourist season. Limited capacity of health services.	Follow-up with the TNRD, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.5 and 7.2.8 Volume 5D Socio-Economic Technical Report
District of Clearwater	Leslie Groulx, CAO Sherri Madden, Services Coordinator (TNRD) Jared Brounstein, Public Works Superintendent Brad Bradbury, Tourism and Marketing Manager	Meeting, Email	November 2012 to March 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Land use/residential constraints. Raft River crossing. Municipal infrastructure regarding timing of construction and Yellowhead Mine development. Disruption of summer tourist season. Simpcw First Nation sites. North Thompson River Provincial Park. Proposed regional park near the Blackfoot Community Centre.	Follow-up with the District of Clearwater, as required, as the Project proceeds.	Volume 5B Sections 7.2.4, 7.2.5 and 7.2.6 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
City of Coquitlam	Verne Kucy, Acting Manager for Environmental Services Division Bill Susak, Engineering and Public Works General Manager Steve Golley, Planning and Development Mark, Engineering and Capital Projects Jim McIntyre, General Manager, Planning and Development Margaret Birch, Environmental Services Coordinator Dana Soong, Manager Utility Programs Rob Thurrott, Lands and Properties Heather Bradfield, Manager, Legal and Bylaw Enforcement Carl Johannsen, Manager, Community Planning	Email, Meeting	November 2012 to April 2013	Project introduction. Overview of ESA Approach and Socio-Economic Assessment.	Future operating implications of City infrastructure and future planning implications. Routing.	Follow-up with the City of Coquitlam, as required, as the Project proceeds.	Volume 5B Section 7.2.5 Volume 5D Socio-Economic Technical Report
District of Barriere	Bill Humphreys, Mayor Colleen Hannigan, CAO	Meeting	November 8, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Highway traffic, particularly equipment/heavy load vehicles' use of Highway 5.	Follow-up with the District of Barriere, as required, as the Project proceeds.	Volume 5B Section 7.2.5 Volume 5D Socio-Economic Technical Report
City of Abbotsford	Jay Teichroeb, General Manager, Economic Development and Planning Services Reuben Koole, Social Planner	Meeting, Phone Call	November 2012 to March 2013	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Two spills on Sumas Mountain. Odour from tank farm. Important to communicate clearly to residents whose property will be impacted. New developments on Sumas Mountain. Annual Abbotsford Airshow in August results in fully booked hotels in the region.	Follow-up with the City of Abbotsford, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.4 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
City of Chilliwack	David Blain, Director of Engineering Roderick Sanderson, Manager of Transportation and Drainage Karen Stanton, Manager of Long Range Planning Tara Friesen, Assistant Manager of Environmental Services	Meeting	November 13, 2012 and July 4, 2013	Project introduction. Review ESA approach. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Groundwater and the Vedder River Fan (Sardis) Aquifer, particularly in relation to an accident or malfunction. Municipal infrastructure. Chilliwack/Vedder River crossing regarding fisheries and environmental concerns. School properties crossed by the proposed pipeline corridor.	Follow-up with the City of Chilliwack, as required, as the Project proceeds.	Volume 5A Section 7.2.3 Volume 5B Sections 7.2.3, 7.2.5, 7.2.6 Volume 5D Socio-Economic Technical Report Volume 7
District of Hope	Susan Johnston, Mayor John Fortoloczky, CAO Ian Vaughan, Director of Operations	Meeting	November 13, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Municipal roads and bridges, in particular Othello Road. Groundwater regarding municipal wells. Archaeological sites of importance. Employment and business opportunities associated with construction of the pipeline.	Follow-up with the District of Hope, as required, as the Project proceeds.	Volume 5A Section 7.2.3 Volume 5B Sections 7.2.1, 7.2.5, 7.2.7 Volume 5D Socio-Economic Technical Report
District of Hope	John Fortoloczky, CAO Scott Misumi, Director of Community Development	Meeting	July 2, 2013	Employment and Economy, Social and Cultural Well-Being, Infrastructure and Services and Human Occupancy and Resource Use data collection and scoping.	Municipal roads, in particular Othello Road. Groundwater regarding municipal wells. Commercial accommodations in Hope would not be able to house estimated workforce. Recreational locations crossed by proposed pipeline corridor.	None.	Volume 5B Sections 7.2.3, 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report
Township of Langley	Ramin Seifi, General Manager Engineering and Community Development Roeland Zwaag, Director of Public Works Stephen Richardson, Director Development Services Scott Thompson, Manager Property Services Bernice Fara, Manager, Legal Services	Meeting	November 15, 2012	Project introduction. Review ESA approach. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	Pipeline spill. Disruption to residents during construction (*e.g.*, pile driving). Would like to provide input on potential re-route options. Coordinating river crossings with municipal infrastructure would be preferred. Engagement of environmental groups important. Northwest Langley and Port Kells industrial area.	Follow-up with the Township of Langley, as required, as the Project proceeds.	Volume 5B Sections 7.2.3, 7.2.5 Volume 5D Socio-Economic Technical Report Volume 7
City of Surrey	Carrie Baron, Drainage and Environment Manager Lee-Ann Pitcairn, Planner Daniel Chow, Senior Planner	Meeting	November 16, 2012	Project introduction. Overview of ESA and Socio-Economic Assessment. Land and resource use, employment and economy, infrastructure and services and social and cultural well-being data collection and issues scoping.	City of Surrey Council is opposed to an increase in tanker traffic. Disruption to residents during construction. Constrained land use of existing right-of-way in both residential and industrial areas. Upcoming large-scale infrastructure projects. Bon Accord Creek.	Follow-up with the City of Surrey, as required, as the Project proceeds.	Volume 5B Sections 7.2.3 and 7.2.4 Volume 5D Socio-Economic Technical Report

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Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
City of Surrey	Don Luymes, Manager, Community Planning Carrie Baron, Drainage and Environment Manager Jason Daviduk, Project Engineer	Meeting	June 25, 2013	Employment and Economy, Social and Cultural Well-Being, Infrastructure and Services and Human Occupancy and Resource Use data collection and scoping.	Infrastructure corridor near Surrey Bend Park: the landscape will change in the near future due to other linear projects. Compensation plans are important. No issues regarding temporary workforce. Municipal access to existing infrastructure.	None.	Volume 5B Sections 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report
FVRD	Linda Machmer, Executive Assistant	Phone Call, Meeting	November 2012 to March 2013	Project update. Overview of Socio-Economic Assessment.	Air quality. Aboriginal consultation. Routing.	Follow-up with the FVRD, as required, as the Project proceeds.	Volume 3B Volume 4A Volume 5A Section 7.2.4 Volume 5D Socio-Economic Technical Report
FVRD	Paul Gipps, CAO Suzanne Gresham Siri Bertelsen	Meeting	July 3, 2013	Project update. Overview of Socio-Economic Assessment.	FVRD is collecting all issues and concerns from Electoral Areas and municipalities to present questions to Trans Mountain. Conducting internal assessment of Project.	Follow-up with the FVRD, as required, as the Project proceeds.	N/A
AdvantageHOPE	Tyler Mattheis	Meeting, Email	January to March 2013	Project introduction. Overview of Socio-Economic Assessment. Employment and Economy, Infrastructure and Services and Social and Cultural Well-Being data collection and scoping.	Trail building as legacy.	Follow-up with AdvantageHOPE, as required, as the Project proceeds.	N/A
City of Burnaby	Dipak Dattani Lily Ford Heather Edwards Dion Doepker Alekxo Sarter Zeralynne Te	Meeting, Email	February to March, 2013	Project introduction. Overview of Socio-Economic Assessment. Employment and Economy, Infrastructure and Services and Social and Cultural Well-Being data collection and scoping.	City of Burnaby Council is opposed to the Project. Spills. Impacts and disruption to neighbourhoods. Long-term community impacts and benefits. Environmental risk.	Follow-up with the City of Burnaby, as required, as the Project proceeds.	Volume 5A Sections 7.2.3 and 7.2.4 Volume 5D Socio-Economic Technical Report Volume 7
Free Rein Associates	Peter Bailey, Director Jodi McBride, Proposals	Meeting, phone call	July 2 and 9, 2013	Project introductions. Overview of the Socio-Economic Assessment. Employment and Economy and Social and Cultural Well-Being data collection and scoping.	The combination of recruitment through a guided process is effective in Hope.	None.	Volume 5B Section 7.2.7 Volume 5D Socio-Economic Technical Report

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
RDFFG	Terry McEachen, General Manager of Development Services Marija Soklic, Manager of Sustainable Development Marisa Nightingale, Planner	Meeting	July 22, 2013	Project introductions. Employment and Economy, Social and Cultural Well-Being, Infrastructure and Services and Human Occupancy and Resource Use data collection and scoping.	Housing/accommodation of temporary construction workers. Routing. Environmentally-sensitive areas.	Follow-up with RDFFG, as required, as the Project proceeds.	Volume 5B Section 7.2.5 Volume 5D Socio-Economic Technical Report
COMMERCIAL RECREATION TENURE HOLDERS							
Interior White Water Expedition Ltd	Claudia (surname not given)	Phone (attempt)	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders' package to discuss potential overlap with their tenure.	None identified. Owners were not available for discussion.	None.	N/A
Maligne Rafting Adventures	Trevor (surname not given)	Phone	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders' package to discuss potential overlap with their tenure.	Winter construction preferred; do not want to be shut down during short summer season. If they are to be shut down, they would expect to be compensated.	None.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report
Mount Robson White Water Rafting Ltd.	Terri (surname not given)	Phone	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders' package to discuss potential overlap with their tenure.	Concerned about any delays due to increased traffic on highways and roads. During the TMX Anchor Loop Project construction, there was noticeable destruction of alpine areas with ATVs by pipeline workers; providing information to workers about recreational opportunities/regulations is important. Minimize impacts on short summer season.	None.	Volume 5B Sections 7.2.4 and 7.2.5 Volume 5D Socio-Economic Technical Report
Reo Rafting Ltd.	Michelle (surname not given)	Phone (attempt)	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders' package to discuss potential overlap with their tenure.	None identified. Owners not available for discussion.	None.	N/A
Stellar Descents Backcountry Adventures Ltd.	Tyler (surname not given)	Phone	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders package to discuss potential overlap with their tenure.	Biggest concern is if the section of the Fraser River used will have to be shut down during their season. Traffic delays. Concerned about the construction crossing methods of the Fraser River.	None.	Volume 5B Sections 7.2.4, 7.2.5 and 7.2.6 Volume 5D Socio-Economic Technical Report
Thompson Rivers University (Adventure Studies Department)	Sheila (surname not given)	Phone (attempt)	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders package to discuss potential overlap with their tenure.	None identified. Not available for discussion.	None.	N/A

TABLE 3.1-11 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Methods of Contact	Date Range of Consultation Activities	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
David Wabnegger (Guide Outfitter)	David Wabnegger	Phone (attempt)	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders package to discuss potential overlap with their tenure.	None identified. Not available for discussion.	None.	N/A
West Canada Bike Tours Ltd	Unknown	Phone (attempt)	August 14, 2013	Follow-up to TMEP commercial recreation tenure holders package to discuss potential overlap with their tenure.	None identified. Not available for discussion.	None.	N/A

Community Health

TABLE 3.1-12

SUMMARY OF CONSULTATION ACTIVITIES FOR COMMUNITY HEALTH

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
FEDERAL CONSULTATION							
First Nations Inuit Health Branch	Peter Mazey, Acting Regional Manager for the Environmental Health Program	Teleconference	July 11, 2013	Project introduction. Discussion of health issue areas.	No specific concerns identified.	None.	N/A
Health Canada	Carl Alleyne, BC Regional Environmental Assessment Coordinator Gladis Lemus, Regional Manager, Environmental Health Program, BC Region	Meeting	January 28, 2013	Project introduction. Discussion of health issue areas.	HHRA methodology. Accidents, malfunctions and releases. Aboriginal health. ESA review process.	None.	Volume 5B Section 7.2.8 Volume 5D Community Health Technical Report
PROVINCIAL CONSULTATION - ALBERTA							
Alberta Health	Dr. Karina Thomas, Environmental Health Scientist, Health Protection Branch Dr. James Talbot, Chief Medical Officer of Health for Alberta	Meeting	February 4, 2013	Project introduction. Discussion of the planned HHRA methodology and community health issues.	No specific concerns identified.	None.	N/A
Alberta Health	Krista Berezowski, Director, Emergency Preparedness and Planning, Emergency Management Unit	Teleconference	May 23, 2013	Project introduction. Discussion of emergency management in Alberta.	No specific concerns identified.	None.	N/A
Alberta Health Services (AHS)	Edith Zuidhof-Knoop, Manager, Addictions and Mental Health Services	Teleconference	April 25, 2013	Project introduction; Discussion of health issue areas.	Mental health first aid program for employers. Mental health/addictions problems. Employer worker support. Limited capacity.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report

TABLE 3.1-12 Cont'd

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
PROVINCIAL CONSULTATION – BRITISH COLUMBIA							
British Columbia Ambulance Service	Paul Vallely, District Manager, Cariboo Fraser Rural Operations	Teleconference	July 19, 2013	Discussion of emergency management systems and ambulance services in BC.	Communication. Medical response. Clean up during spill incidents.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7
Vancouver Coastal Health Authority Fraser Health Authority	Dr. Paul VanBuynder, Chief Medical Health Officer, Fraser Health Authority Dr. Nadine Loewen, Medical Health Officer, Fraser Health Authority Dr. Goran Krstic, HHRA Specialist, Fraser Health Authority Dr. Patricia Daly, Chief Medical Health Officer, Vancouver Coastal Health Dr. James Lu, Medical Health Officer, Vancouver Coastal Health Richard Taki, Regional Director, Health Protection, Vancouver Coastal Health	Meeting	January 28, 2013	Project introduction. Discussion of health issue areas.	Spill prevention and clean up. Health monitoring. Contents of pipelines. Exposure pathways. Air quality. Public engagement. Non-chemical pathways: disease, injury, etc.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7
REGIONAL-LEVEL CONSULTATION - ALBERTA							
Hinton Community Health Services	Kelly Armstrong, Aboriginal Health Liaison	Email	April 17, 2013	Discussion of Aboriginal Health Liaison role.	No specific concerns identified.	None.	N/A
Hinton Health Care Centre	Marilyn Lodder, Acute Care Nurse Manager Valerie Spencer, Administrative Assistant	Teleconference	April 16, 2013	Project introduction. Discussion of health issue areas.	Size of Project workforce and schedule. Material Data Safety sheets to accompany workers to hospital. Communication with health system in case of emergency. Communication of emergency response plan.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7
REGIONAL-LEVEL CONSULTATION – BRITISH COLUMBIA							
Fraser Canyon Hospital	Keith McBain, Executive Director, Fraser Canyon Hospital Catherine Wiebe, Site Manager, Fraser Canyon Hospital	Teleconference	June 26, 2013	Project introduction. Discussion of health issue areas.	Size of Project workforce and schedule. Increase in service demand. First aid responders onsite. Emergency management plans.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7

TABLE 3.1-12 Cont'd

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
Fraser Health Authority	Mark Welch, Manager of Psychiatry, Royal Columbian Hospital Helena Summers, Regional manager of substance use programs, Royal Columbian Hospital	Teleconference	Aug 15, 2013	Discussion of mental health and addictions service capacity near Westridge Marine Terminal.	Planning for housing. Healthy worker policies. Job stress. Partnership development.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7
Fraser Health Authority	Elizabeth Robbins, Manager, Stakeholder Relations	Email	Sept 26, 2013	Project introduction. Discussion of health issue areas for Burnaby Hospital.	Communication with hospital during emergency situations. Preparation for spill response. Community-based programs.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7
Interior Health Authority	Greg Baytalan, Senior Public Health Inspector	Teleconference	March 20, 2013	Discussion of environmental health effects and emergency preparedness.	No specific concerns discussed.	None.	N/A
Valemount Healthcare Centre & McBride Hospital	Debbie Strang, Health Service Administrator	Teleconference	April 25, 2013	Project introduction. Discussion of health issue areas.	First aid responders onsite. Traffic issues. Size of Project workforce and schedule. Emergency management plans. Cooperation.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7
Village of Valemount	Anne Yanciw, CAO	Teleconference	July 11, 2013	Social and health discussion.	Food availability at grocery stores. Lack of consideration for outdoor spaces. Social concerns. Parking and housing.	None.	Volume 5B Sections 5.8 and 7.2.8 Volume 5D Community Health Technical Report Volume 7

TABLE 3.1-13

SUMMARY OF CONSULTATION ACTIVITIES FOR FOREST HEALTH

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
PROVINCIAL CONSULTATION - ALBERTA							
Alberta Environment and Sustainable Resource Development	Aaron McGill	Telephone Email	May 14, 2013	Requested annual forest health aerial overview spatial data and Forest Management Unit/Forest Management Area (FMU/FMA) data.	Received all forest health data. No FMA/FMU data provided.	None. Information provided May 14 and 15, 2013.	Volume 5B Section 7.2.4 Volume 5D Managed Forests Areas and Forest Health Technical Report
Alberta Environment and Sustainable Resource Development	Dave Sadowsky	Telephone Email	July 30, 2013	Requested spatial data to identify FMU/FMAs and requested contact information.	--	None. Information provided July 30, 2013.	N/A
PROVINCIAL CONSULTATION – BRITISH COLUMBIA							
Ministry of Forest, Lands and Natural Resource Operations	Megan Williams, Senior Natural Resource Specialist	Email Telephone	December 13, 2012	Requested most up to date timber licensee data for cross-checking with Land and Resource Data Warehouse data.	Community Forest Tenures, Tree Farm Licences and Woodlots not provided.	None. Community Forest Tenures, Tree Farm Licences and Woodlots obtained from Land and Resource Data Warehouse.	N/A
Ministry of Forests, Lands and Natural Resource Operations Kamloops Forest District/Headwaters Forest District	Doug Campbell, Tenures Officer	Email	June 28, 2013	Requested verification and contact information for all timber licensees and woodlot operators in the Chilliwack Forest District.	Additional information provided by Deanna Horvath (Tenures Clerk) on July 10, 2013.	None. Information provided on July 10, 2013.	Volume 5B Section 7.2.4 Volume 5D Managed Forests Areas and Forest Health Technical Report
Ministry of Forests, Lands and Natural Resource Operations Kamloops Forest District	Bage Singh, Tenures Technician	Email	July 11, 2013	Requested verification and contact information for all timber licensees and woodlot operators in the Kamloops Forest District.	Have not received confirmation or contact information for woodlot operators in the Kamloops Forest District. Initial request sent to Dirk Trigg (Tenures) on June 28, 2013 via telephone and email.	--	Volume 5B Section 7.2.4 Volume 5D Managed Forests Areas and Forest Health Technical Report
Ministry of Forests, Lands and Natural Resource Operations Cascades Forest District	Dave Horne, Tenures Officer	Telephone Email	July 26, 2013	Requested verification and contact information for all timber licensees and woodlot operators in the Cascades Forest District.	Waiting for licensee and woodlot contact information. Initial request sent to Len Marsh (Tenures) on July 15, 2013 via telephone and email.	--	Volume 5B Section 7.2.4 Volume 5D Managed Forests Areas and Forest Health Technical Report

TABLE 3.1-14

SUMMARY OF CONSULTATION ACTIVITIES RELATED TO THE HUMAN HEALTH RISK ASSESSMENT

Stakeholder Group/ Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/ Follow-Up Actions/ Comments	Where Issue is Addressed in the Application
FEDERAL CONSULTATION							
Health Canada (BC Region)	Dr. Carl Alleyne, BC Regional Environmental Assessment Coordinator Dr. Gladis Lemus, BC Regional Manager	Meeting	January 28, 2013	Project introduction. Discussion of the planned HHRA methodology.	Health Canada advised that they will be directing particular attention to Aboriginal health. Health Canada expressed an interest in knowing the potential health effects associated with accidents and malfunctions. Health Canada will be interested in knowing the potential short-term as well as long-term health effects associated with the Project, with consideration given to all relevant exposure pathways.	None.	Volume 5B Section 7.5.8 Volume 5D Screening Level Human Health Risk Assessment for Pipelines and Facilities
PROVINCIAL CONSULTATION - ALBERTA							
Alberta Health	Dr. Karina Thomas, Environmental Health Scientist, Health Protection Branch Dr. James Talbot, Chief Medical Officer of Health for Alberta	Meeting	February 4, 2013	Project introduction. Discussion of the planned HHRA methodology.	No specific issues/concern regarding the planned HHRA methodology were identified.	Alberta Health requested that the HHRA team keep them informed of progress as the HHRA is completed.	Volume 5B Section 7.5.8 Volume 5D Screening Level Human Health Risk Assessment for Pipelines and Facilities
LOCAL CONSULTATION - BRITISH COLUMBIA							
Fraser Health Authority (FHA)	Dr. Paul Van Buynder, Chief Medical Health Officer Dr. Nadine Loewen, Medical Health Officer Dr. Goran Krstic, Human Health Risk Assessment Specialist, Health Protection Tim Shum, Regional Director	Meeting	January 28, 2013	Project introduction. Discussion of the planned HHRA methodology.	FHA and VCHA expressed an interest in knowing whether any long-term monitoring of health is planned. FHA and VCHA expressed an interest in knowing the historical effects of the Legacy Line. FHA and VCHA expressed an interest in knowing the potential health effects associated with a spill to an urban environment. FHA and VCHA will be interested in knowing the potential short-term as well as long-term health effects associated with the Project, with consideration given to all relevant exposure pathways.	None.	Volume 5B Section 7.5.8 Volume 5D Screening Level Human Health Risk Assessment for Pipelines and Facilities
Vancouver Coastal Health Authority (VCHA)	Dr. Patricia Daly, Chief Medical Health Officer Dr. James Lu, Medical Health Officer, Richmond Public Health Dr. Richard Taki, Regional Director, Health Protection						
Fraser Valley Regional District (FVRD)	Alison Stewart, Senior Planner, Strategic Planning and Initiatives	Telephone call	March 20, 2013	Project introduction. Discussion of the planned HHRA methodology.	FVRD expressed an interest in knowing the potential effects of the Project on air quality, and subsequently human health, in the FVRD. From a health perspective, Ms. Stewart indicated that the FVRD would be taking their direction from FHA.	None.	Volume 5B Section 7.5.8 Volume 5D Screening Level Human Health Risk Assessment for Pipelines and Facilities

TABLE 3.1-15

SUMMARY OF CONSULTATION ACTIVITIES RELATED TO THE AGRICULTURAL ASSESSMENT

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
FEDERAL CONSULTATION							
Canadian Food Inspection Agency	Elizabeth Powles, Horticulture Specialist	Phone	August 30, 2013	Information on movement of people and equipment.	Biosecurity.	None.	N/A
Canadian Food Inspection Agency	Dr. Ann Allain, Animal Products and By-Products	Phone	August 30, 2013	Animal health.	Biosecurity.	None.	N/A
Canadian Food Inspection Agency	Dominique Pelletier, Senior Horticultural Specialist	Phone	August 30, 2013	Quarantine pests.	Biosecurity.	None.	N/A
PROVINCIAL CONSULTATION – ALBERTA							
Alberta Agriculture and Rural Development	Dale Kaleil, Senior Production Economist	Phone	July 5, 2013	Economic effects of pipeline construction on agriculture.	Financial effects and quantification of effects.	None.	Volume 5B Section 7.2.7 Volume 5D Agricultural Assessment Technical Report
PROVINCIAL CONSULTATION – BRITISH COLUMBIA							
BC Ministry of Agriculture	Geoff Hughes-Games, Provincial Soil Specialist	Meeting	June 11, 2013	Discussions on impact of pipeline construction on agriculture.	Soil handling. Communication. Drainage. Pipe depth. Field access.	None.	Volume 5A Sections 5.2 and 7.2.2 Volume 5B Section 7.2.4 Volume 5C Soils Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
BC Ministry of Agriculture	Orlando Schmidt, Provincial Environmental Soil Specialist	Meeting	June 11, 2013	Discussions on effect of pipeline construction on agriculture.	Soil handling. Communication. Drainage. Pipe depth. Field access.	None.	Volume 5A Sections 5.2 and 7.2.2 Volume 5B Section 7.2.4 Volume 5C Soils Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B

TABLE 3.1-15 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
BC Ministry of Agriculture	Francis Mienga Manager Agriculture and Wildlife Program	Phone	July 3, 2013	Effect of pipeline construction on ranches.	Water access. Weeds and invasive plants. Fencing.	None.	Volume 5A Sections 5.3, 5.9, 7.2.3 and 7.2.9 Volume 5B Section 7.2.4 Volume 5C Groundwater Technical Report Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
BC Ministry of Agriculture	Jim Forbes, Rangeland Specialist	Phone	July 10, 2013	Effect of pipeline construction on ranches.	Invasive species. Soil handling. Disruption to operations.	None.	Volume 5A Sections 5.2, 5.9, 7.2.2 and 7.2.9 Volume 5B Section 7.2.4 Volume 5C Soils Technical Report Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
BC Ministry of Agriculture	Leila Salm, Thompson area Range Officer	Phone	July 3, 2013	Effect of pipeline construction on ranches.	Weeds and invasive plants.	None.	Volume 5A Sections 5.9 and 7.2.9 Volume 5B Section 7.2.4 Volume 5C Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
BC Ministry of Agriculture	Kathleen Zimmerman, District Agrologist	Phone	July 30. 2013	Effect of pipeline construction on berry crops.	Dust and dust control.	None.	Volume 5B Section 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6B

TABLE 3.1-15 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
BC Agriculture Land Commission	Colin Fry Brain Underhill Executive Directors	Meeting	July 15, 2013	General discussion on impact of pipeline construction on agriculture.	Depth of pipe. Proper soil handling. Fair compensation to farmers. Duration of construction. Weed control. Disruption to farm infrastructure (drainage and irrigation). Dust on blueberries.	None.	Volume 5A Sections 5.2, 5.9, 7.2.2, 7.2.4 and 7.2.9 Volume 5B Sections 7.2.4 and 7.2.7 Volume 5C Soils Technical Report Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
OTHER CONSULTATION							
Organic Dairy Farmer	David Janssen, Owner	Phone	July 26, 2013	Impact of noise on dairy cows.	Noise effect on milk production.	None.	Volume 5A Section 7.2.6 Volume 5C Agricultural Assessment Technical Report Volume 6B
Blueberry farmer and processor	Dave Sandu, Owner	Meeting	July 26, 2013	Effects of pipeline construction on blueberry harvesting and fruit quality.	Dust effects. Routing angle through fields.	None.	Volume 5A Section 7.2.4 Volume 5B Volume 7.2.4 Volume 5C Air Quality and Greenhouse Gas Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
Nursery owner Past President BC Landscape & Nursery Association	Gord Mathies, owner	Meeting	June 18, 2013	Effects of pipeline construction on field nurseries.	Irrigation lines. Drain lines. Routing angle through fields. Consultation early. Compensation. Access.	None.	Volume 5A Section 7.2.3 Volume 5B Section 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6B

TABLE 3.1-15 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
BC Landscape & Nursery Association	Hedy Dyck, CEO	Meeting	June 23, 2013	Effects of pipeline construction on field and container nurseries.	Irrigation lines. Drain lines. Routing angle through fields. Consultation early. Compensation. Access.	None.	Volume 5B Section 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6B
Nursery owner Past President BC Landscape & Nursery Association	Bill van Belle Owner on TMPL	Meeting	June 23, 2013	Financial effects of pipeline construction on container nurseries.	Compensation. Damage to infrastructure including irrigation, water recirculation and automated systems.	None.	Volume 5B Section 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6B
Poultry Farmer including organic, broilers, and specialty birds	Garrett Broatch, Owner	Phone	July 25, 2013	Financial impact of pipeline construction on poultry farms.	Financial effect. Biosecurity impact.	None.	Volume 5B Section 7.2.7 Volume 5D Agricultural Assessment Technical Report
Agricultural Advisory Committee Abbotsford Greenhouse Vegetable Industry	Marcus Janzen Member Abbotsford Agricultural Advisory Committee	Phone	August 15, 2013	Financial impact of pipeline construction on farms.	Consultation with farmers.	None.	Volume 3C
Owner/manager Guichon Ranch	Allison Guichon Owner	Meeting	July 29, 2013	Effect of pipeline construction on ranches.	Weeds. Reclamation. Consultation with landowners and tenure holders. Water and irrigation. Fencing. Public access. Biosecurity.	None.	Volume 3C Volume 5A Sections 5.3, 5.9, 7.2.3 and 7.2.9 Volume 5B Section 7.2.4 Volume 5C Groundwater Technical Report Fisheries (British Columbia) Technical Report Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Socio-Economic Technical Report Volume 6B

TABLE 3.1-15 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
Owner/manager Pine Ranch	Bill Strand, Owner	Meeting	July 29, 2013	Effect of pipeline construction on ranches.	Weeds. Reclamation. Consultation with landowners and tenure holders. Water and irrigation. Fencing. Public access.	None.	Volume 3C Volume 5A Sections 5.3, 5.9, 7.2.3 and 7.2.9 Volume 5B Section 7.2.4 Volume 5C Groundwater Technical Report Fisheries (British Columbia) Technical Report Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
Southern Interior Weed Management Committee	Jo-Anne Fox Program Manager	Phone	July 3, 2013	Effect of pipeline construction on weeds.	Weed management. Consultation with owners and tenure holders. Fencing. Water supply. Access roads.	None.	Volume 3C Volume 5A Sections 5.3, 5.9, 7.2.3 and 7.2.9 Volume 5B Section 7.2.4 Volume 5C Groundwater Technical Report Fisheries (British Columbia) Technical Report Vegetation Technical Report Volume 5D Agricultural Assessment Technical Report Volume 6B
Greenbelt Veterinary Services Ltd.	Dr. Dick Clegg, Veterinary	Phone	July 25, 2013	Effect of pipeline construction on animal health.	Economic effect of pipeline expansion on dairy cows in the disturbance zone. Mitigation measures. Biosecurity.	None.	Volume 6B Volume 6C

TABLE 3.1-15 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason for Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments	Where Issue is Addressed in the Application
BC Chicken Marketing Board	Kathy Erickson	Meeting	July 17, 2013	Effect of pipeline construction on poultry health and productivity.	Noise. Vibration. Biosecurity.	None.	Volume 5B Section 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6B
Dairy Farmer	Bill Kools	Phone	July 25, 2013	Financial effect of construction of dairy farms.	Value of forage. Short term and long term effects.	None.	N/A

3.2 Aboriginal Engagement

Since April 2012, Trans Mountain has engaged with Aboriginal communities that might have an interest in the Project or have Aboriginal interests potentially affected by the Project, based on the proximity of their community and their assertion of traditional and cultural use of the land along the proposed pipeline corridor to maintain a traditional lifestyle. Trans Mountain respects the Aboriginal and treaty rights, unique culture, diversity, languages and traditions of Aboriginal people. Trans Mountain acknowledges the importance of teaching, the significance of culture and language and the considerable traditional knowledge that has been passed on for generations and, as such, is committed to continued listening, learning and working with Aboriginal people to ensure that knowledge and advice is considered and incorporated in the Project. The Aboriginal Engagement Program is based on mutual respect, timeliness, accountability and transparency in order to build positive and productive relationships for the long-term.

This subsection provides information on the Aboriginal Engagement Program for the Project and describes how the results of Project engagement activities relating to the ESA were gathered as well as how these results have been incorporated into the application. The Aboriginal Engagement Program was developed in accordance with the KMC Aboriginal Policy and Volume 3B provides detailed information on Trans Mountain's approach to the Aboriginal Engagement Program as well as detailed information on the Trans Mountain vision and the principles and goals of the engagement program and engagement activity to date.

For purposes of this application, the engagement activities conducted to date are reported up to November 30, 2013. The results of ongoing engagement efforts will be reported in supplemental filings.

3.2.1 Design of Aboriginal Engagement Program

3.2.1.1 Identification of Aboriginal Communities and Aboriginal Groups

Beginning in 2012, Trans Mountain worked in collaboration with the federal government and provincial ministries to identify Aboriginal communities and groups for engagement. Aboriginal communities in BC were identified as those within a 10 km buffer of the corridor. Of these, there are Aboriginal communities who are negotiating treaties within the BC Treaty Commission process and those that are not currently engaged in the BC treaty process. Aboriginal communities in Alberta were identified as those within a 100 km buffer of the corridor.

Trans Mountain also contacted each of the provincial government ministries – the BC Ministry of Aboriginal Relations and Reconciliation and the Alberta Ministry of Aboriginal Affairs and received guidance on the development of engagement lists for the Project. In addition to engagement with the federal and provincial ministries, further engagement took place in early 2012 with representatives from the Major Projects Management Office (MPMO), NEB, and BC Oil and Gas Commission (OGC) regarding communities and groups to include in the Aboriginal Engagement Program.

The result was a comprehensive list of 103 Aboriginal communities with traditional territories located within 10 km of the corridor in BC and 100 km in Alberta, and two non-land based BC Métis groups included in the engagement list: the BC Métis Federation (BCMF); and the Métis Nation of BC (MNBC). In total, Trans Mountain is engaged with 105 Aboriginal communities and Aboriginal groups. Geographically, in Alberta and BC, there are substantial areas of shared territory with the 103 communities engaged.

Details regarding the identification of communities that might have an interest in the Project or having Aboriginal interests potentially affected by the Project are provided in Volume 3B.

3.2.1.2 Aboriginal Communities and Aboriginal Groups Engaged

The following is a list of the 103 Aboriginal communities and two non-land based BC Métis groups in proximity to the pipeline corridor and marine corridor that was assessed pursuant to the NEB's instruction in their List of Issues, issued July 29, 2013, that might have an interest in the Project or have Aboriginal interests potentially affected by the Project.

Aboriginal Communities Located in the Edmonton to Alberta/British Columbia Border Region

Alexander First Nation	Louis Bull Tribe	Samson Cree Nation
Alexis Nakota Sioux Nation	Métis Regional Council Zone IV of the Métis Nation of Alberta (Region 4)	Sturgeon Lake Cree Nation
Aseniwuche Winewak Nation	Montana First Nation	Sunchild First Nation
Enoch Cree Nation	Nakcowinewak Nation of Canada	
ErmineskinCree Nation	O'Chiese First Nation	
Foothills Ojibway First Nation	Paul First Nation	
Horse Lake First Nation	Saddle Lake Cree Nation	

Aboriginal Communities Located in the Alberta/British Columbia Border to Kamloops Region

Adams Lake Indian Band	Lhtako Dene Nation	Splatsin First Nation
Aseniwuche Winewak Nation	Neskonlith Indian Band	Tk'emlúps te Secwepemc
Ashcroft Indian Band	Oregon Jack Creek Band	Toosey Indian Band
Canim Lake Band (Tsq'escenemc Nation)	Shuswap Indian Band	Whispering Pines (Clinton Indian Band)
Little Shuswap Indian Band	Simpcw First Nation	Xat'sull First Nation (Soda Creek)
Lheidli T'enneh	Skeetchestn First Nation	

Aboriginal Communities Located in the Kamloops to Hope Region

Boothroyd Band	Lower Similkameen Indian Band	Siska Indian Band
Boston Bar Band	Lytton First Nation	Skuppah Indian Band
Coldwater Indian Band	Nicomen Indian Band	Spuzzum First Nation
Cook's Ferry Indian Band	Nooaitch Indian Band	St'uxwtews (Bonaparte Indian Band)
Kanaka Bar	Penticton Indian Band	Upper Nicola Indian Band
Lower Nicola Indian Band	Shackan Indian Band	Upper Similkameen Indian Band

Aboriginal Communities Located in the Hope to Burnaby Terminal/Burrard Inlet Region

Aitchelitz First Nation	Popkum First Nation	Squamish First Nation
Chawathil First Nation	Qayqayt First Nation	Squiala First Nation
Cheam First Nation	Scowlitz First Nation	Sts'ailes Band (Chehalis Indian Band)
Katzie First Nation	Seabird Island Band	Sumas First Nation
Kwantlen First Nation	Semiahmoo First Nation	Tsawwassen First Nation
Kwaw-kwaw-aplit First Nation	Shxw'ow'hamel First Nation	Tsleil-Waututh Nation
Kwikwetlem First Nation	Shxwha:y Village	Tzeachten First Nation
Leq'á:mel First Nation	Skawahlook First Nation	Union Bar First Nations
Matsqui First Nation	Skowkale First Nation	Yakweakwioose First Nation
Musqueam First Nation	Skwah First Nation	Yale First nation
Peters Indian Band	Soowahlie First Nation	

Aboriginal Communities Located in the Marine Corridor

Cowichan Tribes	Pacheedaht First Nation	Songhees Nation
Esquimalt Nation	Pauquachin First Nation	Stz'uminus First Nation (Chemainus)
Halalt First Nation	Pacheedaht First Nation	T'Sou-ke First Nation
Hwlitsum First Nation	Scia'new Indian Band (Beecher Bay)	Tsartlip First Nation
Lake Cowichan First Nation	Sechelt Indian Band	Twawout First Nation
Lyackson First Nation	Snaw-Naw-As (Nanoose)	Tseycum First Nation
Malahat First Nation	Snuneymuxw First Nation	Stz'uminus First Nation (Chemainus)

Aboriginal Groups – Non-Boundary Specific

BC Métis Federation
Métis Nation of BC

3.2.1.3 Associations, Councils and Tribes

Trans Mountain has also engaged with multiple Aboriginal associations, councils and tribes, of which many of the Aboriginal communities listed in Section 3.2.1.3 are members. Additional details are provided in Volume 3B.

Cowichan Nation Alliance

The Cowichan Nation Alliance is an organization that was identified by Trans Mountain as an entity that might have an interest in the Project or having Aboriginal interests potentially affected by the Project. Made up of eight member communities, for the purposes of the Project, Trans Mountain is engaging with the following member communities who have indicated an interest in the Project:

- Cowichan Tribes;
- Halalt First Nation;
- Hwlitsum First Nation;
- Penelakut Tribe; and
- Stz'uminus First Nation.

Trans Mountain continues to engage with individual member communities and the Cowichan Nation Alliance to further enhance the Aboriginal Engagement Program.

Okanagan Nation Alliance

The Okanagan Nation Alliance is an organization that was identified by Trans Mountain as an entity that might have an interest in the Project or having Aboriginal interests potentially affected by the Project. Made up of eight member communities, for the purposes of the Project, Trans Mountain is engaged with the following four member communities who have indicated an interest in the Project:

- Lower Similkameen Indian Band;
- Penticton Indian Band;
- Upper Nicola Band; and
- Upper Similkameen Indian Band.

Trans Mountain continues to engage with the individual member communities and the Okanagan Nation Alliance to further enhance the Aboriginal Engagement Program.

Nicola Tribal Association

The Nicola Tribal Association is an organization that was identified by Trans Mountain as an entity that might have an interest in the Project or having Aboriginal interests potentially affected by the Project. Made up of seven member nations, for the purposes of the Project, Trans Mountain is engaged with the following Nicola Tribal Association member communities who have indicated an interest in the Project:

- Nicomen Indian Band;
- Nooaitch Indian Band; and
- Shacken Indian Band.

Trans Mountain continues to engage with the individual member communities and the Nicola Tribal Association to further enhance the Aboriginal Engagement Program.

Stkemlupsemc Te Secwepemc

Stkemlupsemc Te Secwepemc is an organization that was identified by Trans Mountain as an entity that might have an interest in the Project or having Aboriginal interests potentially affected by the Project.

As an administrative body working with communities with shared territories, for the purposes of the Project, Trans Mountain is engaged with the following Stkemlupsemc Te Secwepemc member communities who have indicated an interest in the Project:

- Skeetchestn First Nation; and
- Tk'emlups te Secwepemc.

Trans Mountain continues to engage with the individual member communities and the Stkemlupsemc Te Secwepemc to further enhance the Aboriginal Engagement Program.

Ts'elxweyeqw Tribe Management Limited

Ts'elxweyeqw Tribe Management Limited is an organization that was identified by Trans Mountain as an entity that might have an interest in the Project or having Aboriginal interests potentially affected by the Project. Ts'elxweyeqw Tribe Management Limited comprises the following communities (all of which are engaged with the Project):

- Aitchelitz First Nation;
- Shxwha:y Village;
- Skowkale First Nation;
- Soowahlie Indian Band;
- Squila First Nation;
- Tzeachten First Nation; and
- Yakweakwioose First Nation.

For the purposes of a Capacity Funding Agreement, the following Aboriginal communities are engaged with Ts'elxweyeqe Tribe:

- Kwaw-kwaw-apilt First Nation; and
- Shwah First Nation.

Additionally, for the purposes of an Integrated Cultural Assessment, the following two Aboriginal communities are engaged with the Project:

- Cheam First Nation; and
- Sumas First Nation.

Trans Mountain continues to engage with the individual member communities and Ts'elxweyeqw Tribe Management Limited to further enhance the Aboriginal Engagement Program.

3.2.1.4 Engagement Method

The Aboriginal Engagement Program uses a comprehensive Aboriginal engagement process led by experienced engagement advisors in Alberta and BC, working with a group of professionals who are specialised in the areas of Aboriginal relations, law, economic development, education, training,

employment and procurement. Trans Mountain's engagement process for the Project is flexible, allowing each community and group to engage in meaningful dialogue in the manner they choose and in a way that meets their objectives and values.

In May 2012, the Trans Mountain Aboriginal engagement team was created and Aboriginal engagement team field advisors were assigned to each of the groups based on their knowledge and experience. Each advisor is a professional experienced in engagement.

The Aboriginal Engagement Program focuses on:

- enhancing trusting and respectful relationships;
- sharing Project information – Project scope, routing options, safety and emergency response, scheduling, environmental field study components;
- negotiating group and community-specific protocols, capacity agreements, Letters of Understanding and Mutual Benefit Agreements, as appropriate;
- facilitating Traditional Land Use (TLU) studies, socio-economic interviews and Traditional Ecological Knowledge (TEK) collection;
- identifying potential effects and addressing concerns;
- discussing the adequacy of planned mitigation and opportunities; and
- identifying education, training, employment and procurement opportunities.

3.2.1.5 Comprehensive Aboriginal Engagement Process

Acting as a framework for the engagement process, the following activities provide guidance to ensure a comprehensive and consistent process in working with each of the communities identified by Trans Mountain.

As outlined in Volume 3B, each community has the opportunity to engage with Trans Mountain in the manner they choose, depending on Project interests and potential effects:

- Project announcement;
- initial contact with Aboriginal community or Aboriginal group;
- meetings with Chief and Council and meetings with staff;
- negotiate and execute confidential letter of understanding/capacity agreement;
- host community information session(s);
- conduct TLU studies and socio-economic interviews;
- identify interests and concerns;
- identify mitigation options;
- provide additional capacity funding, if required; and
- negotiate and execute confidential mutual benefits agreement.

In December 2013, at the time of filing, Trans Mountain continues to actively engage with all Aboriginal communities that have been identified as having an interest in the Project or have Aboriginal interests potentially affected by the Project. Engagement with Aboriginal communities is at varying stages in the

engagement process. Specific detail about the engagement activities and the status of engagement with each group can be found in Section 1.5 of Volume 3B and within Appendix A of Volume 3B.

3.2.1.6 Incorporating Aboriginal Traditional Land Use Studies, Traditional Marine Resource Use Studies and Traditional Ecological Knowledge

Traditional Land and Resource Use/Traditional Marine Resource Use

TERA was commissioned to assist in the collection of traditional land and resource use information with potentially affected Aboriginal communities that focused on the current use of Crown lands and waters for traditional activities potentially disturbed by pipeline and facility construction and clean-up activities, including associated physical works and activities. Although regulation and authorization of marine transportation is not specifically within the jurisdiction of the NEB, the environmental and socio-economic effects of the increased marine traffic is considered by Trans Mountain in accordance with the NEB's direction from their List of Issues for the Project, released on July 29, 2013. The engagement activities with potentially affected Aboriginal communities in relation to the marine vessel traffic are described in Volume 8A.

Trans Mountain and TERA acknowledge the unique relationship that has evolved between the Aboriginal people and their surrounding physical environment. This physical environment includes the lands, waters, resources and events that have shaped and sustained the local Aboriginal people, their culture and their communities. In Volume 5B, TERA will refer to this relationship as "traditional land use" or "traditional land and resource use", and both shall be interpreted broadly, respectful of the Aboriginal worldview, not limited to lands, but be inclusive of all aspects of the terrestrial and marine environments.

The aim of the TLU studies is to assess and mitigate effects of the Project on current use of Crown lands for traditional activities and on identified TLU sites. This is achieved by meeting the following objectives:

- determine the extent and general nature of each community's current use of lands for traditional activities relative to the Project;
- identify existing concerns and potential effects of the Project on traditional land and resource use for baseline scoping and selection of social or environmental indicators for the effects assessment;
- provide traditional knowledge information, where appropriate, for the assessment of potential Project-related effects on traditional land and resource use; and
- establish appropriate site-specific mitigation measures to address concerns raised relative to the Project regarding traditional land and resource use.

Following Project initiation, Trans Mountain began facilitation of the TLU studies conducted by interested Aboriginal communities for the Project (see Traditional Land and Resource Use Technical Report of Volume 5D). The Project scope, timetable and location were discussed. Project information packages, which included a Project description, facts on the nature, timing, scope and location of the Project and relevant contact information for communication with Trans Mountain and TERA, were sent to each community and meetings were subsequently scheduled. Communities were also provided with copies of the proposed TLU study methods and a draft outline of TERA's TLU study work plan. The initiation of TLU studies, either as TERA-facilitated or community directed using a third-party consultant, was discussed with Aboriginal communities based on an indicated interest in participating in these studies.

Trans Mountain also provided funding to assist Aboriginal communities that elected to conduct their own community-directed TLU studies. These communities often engaged other consultants to provide technical support and assistance with their TLU studies for the Project. During these studies, community representatives are asked to contribute to the discussion of potential Project-related effects on TLU and to participate in the discussion of potential mitigation measures to reduce potential Project-related effects.

TERA has prepared a separate Traditional Land and Resource Use Technical Report that outlines Trans Mountain's information collection efforts for the assessment of potential adverse effects of the Project on

current land use for traditional purposes (Volume 5D). Volume 5D also provides a description of how TLU studies were developed for each interested Aboriginal community. The TLU information collected has been incorporated into the Traditional Land and Resource Use Technical Report and used to assist in the assessment of the potential effects of the Project.

Appendix A of Volume 3B provides a summary of the meetings and interviews that took place for the traditional land and resource use component of the socio-economic assessment. The issues that were raised and where they are considered in the traditional land and resource use assessment are also summarized in Table 3.2-2.

3.2.1.7 Traditional Ecological Knowledge

TEK does not have a stand-alone section in the ESA. However, TEK information has been incorporated throughout Volumes 5A and 5B, where appropriate. It has contributed by supplementing the methodology of the archaeological field study. TEK has also contributed by adding results that western science may not have gathered or considered, confirmed results that had been collected through scientific field studies as well as identifying and confirming issues of concern that would need to be addressed in the ESA.

Review of collected TEK and discussions of potential Project-related effects and mitigation strategies described in this ESA were conducted directly with participating community members during the field surveys. Approximately 28 Aboriginal communities were engaged in the TEK program with over 200 participants involved in field surveys. Confirmation of the accuracy of the information incorporated and approval of the inclusion of the confidential and proprietary information in Project planning occurred in the field during community follow-up results review (Table 3.2-1). The TEK collected has been incorporated into the heritage resources setting of this ESA (Section 5.1) and used to assist in the assessment of the potential effects of the Project. The issues that were raised and where they are considered in Volume 5B ESA – Socio-Economic are summarized in Table 3.2-2.

3.2.2 Implementation

A number of methods have been used to inform Aboriginal communities, obtain feedback and identify issues about the Project including: Project letters, meetings, phone conversations, email dialogue, newsletters; public information sessions; the Project website and over 4,000 engagement activities have been carried out to date. The results of these engagement efforts, in conjunction with the collection of Traditional Land Use (TLU), TEK and socio-economic information (Sections 3.2.1.5, 3.2.2.4, and 3.2.2.5) have contributed to the development of the ESA for the pipelines and facilities components of the Project (Volumes 5A and 5B), including mitigation and enhancement measures. A detailed overview of the engagement activities implemented to date and a detailed summary of engagement with each Aboriginal community is available in Volume 3B.

3.2.2.1 Employment, Education and Training

Trans Mountain is committed to supporting the sustainability of Aboriginal communities through the creation of employment opportunities over the life of the proposed Project and is committed to the development of an Aboriginal workforce through effective and accessible training programs to maximize participation in available employment opportunities.

As detailed in Volume 3B, Trans Mountain is working in partnership with communities to achieve the objectives of the Aboriginal Peoples Training Policy to enhance employment opportunities with all interested communities, including marine communities.

3.2.2.2 Project Letters, Update Newsletters and Trans Mountain Website

The communications materials forwarded communities that might have an interest in the Project or have Aboriginal interests potentially affected by the Project by Trans Mountain included the following:

- Project notification and introduction letter;

- advanced notice of field study work letter and field study process brochure;
- Project update letters and newsletters including updates to the Project website content, regulatory filings and participation funding;
- letter invitations to meet to discuss routing options for those communities where the existing TMPL system encounters Indian Reserve (IR) lands; and
- Project Description as filed with the NEB.

The formal kick-off for Project engagement began with a Project notification letter sent from Ian Anderson, President of KMC, on May 29, 2012. Three versions of the letter were created and distributed depending on community location and proximity to the pipeline right-of-way.

The ESA Approach Summary document issued in March 2013 intended to provide an overview of Trans Mountain's understanding of the environmental and socio-economic context of the Project at the time of its release. Since its release, Trans Mountain continues to actively engage with regulatory authorities, stakeholders and Aboriginal communities on the methods, indicators and spatial boundaries listed in the approach document. Methods, indicators, and spatial boundaries for many of the environmental and socio-economic elements were revised based on comments received. In May 2013 Trans Mountain filed the Project Description for the Project with the NEB, which included updated information on key issues and indicators.

Communication materials have been compiled to meet NEB filing requirements and details (including samples) of these materials are provided in Volume 3B.

3.2.2.3 Project Meetings

Following distribution of the Project notification letter, Trans Mountain contacted Aboriginal communities to set up in-person meetings to discuss the Project with Chief and Council, staff and community members. The primary purpose of Project meetings is to share Project-related information. For initial meetings specifically with Chief and Council or community staff, the primary objective is to determine the community's interest in engagement and to develop a process for involvement in Project activities. A presentation titled "Aboriginal Engagement Program: Trans Mountain Expansion Project" is used during initial meetings to share project details with attendees (see Volume 3B). Copies of the presentation were left with attendees post-meeting. Routing maps and operational information is also discussed at Project meetings and questions from meeting attendees are addressed.

Meetings and community gatherings were arranged with the assistance of community council leadership and staff. In general, open houses and introductory meetings were conducted by both Trans Mountain and TERA, while TERA conducted subsequent meetings as representatives of Trans Mountain.

Meetings with Aboriginal leadership and staff, harvesters and trappers were an important method of engagement. Meetings were held to:

- introduce the Project (timelines, Project description, regulatory requirements, process);
- provide a broad understanding of the NEB process;
- discuss methods for conducting engagement in the community;
- negotiate work plans and funding for those Aboriginal communities who propose to conduct their own TLU studies or socio-economic data collection;
- initiate environmental field work, TLU studies and socio-economic assessment discussions;
- identify economic development opportunities;

- identify capacity issues with Aboriginal communities to address ability of the community to participate in the Project review;
- identify community concerns, interests and opportunities;
- obtain input and feedback on environmental field studies;
- identify site-specific concerns and interests for harvesters;
- identify site-specific locations important for historical and cultural reasons; and
- determine the TLU approach.

Meetings with specific communities are summarized in Volume 3B. Table 3.2-2 provides further information regarding issues and concerns identified through Project-related meetings with Aboriginal communities.

3.2.2.4 Environmental Field Program Participation

The purpose of Aboriginal participation during the environmental field program is to incorporate Aboriginal views and the additional knowledge of the land that has accumulated over generations and passed down from the Elders into the consideration of potential Project-related environmental effects. The collection of TEK for the Project focused on Aboriginal additional knowledge of the land and field reconnaissance was conducted along Crown lands potentially disturbed by Project construction, including associated physical works and activities. The objectives of Aboriginal participation during the archaeological field surveys are to:

- document the TEK of Aboriginal communities;
- augment the design and execution of the field surveys;
- inform baseline/existing conditions;
- identify potential effects of the Project on environmental resources;
- integrate TEK into the consideration and mitigation of environmental effects; and
- contribute to final Project design.

TERA, on behalf of Trans Mountain, was commissioned to facilitate the participation of potentially affected Aboriginal communities during the archaeological field studies conducted for the Project. Engagement for the Project was initiated in spring 2012 and continued throughout 2013. Opportunities for Project participation were made available to potentially affected Aboriginal communities that have an interest in the Project, based on their proximity to the Project or their assertion of traditional and cultural rights of the land.

An important issue identified by the participating Aboriginal communities was the need for their participation and contribution to the archaeological field programs, while balancing capacity limitations in their respective lands departments. The field program was designed to provide Aboriginal community members with the opportunity to provide TEK information to the ESA. Translators were made available in the field upon the request of a given community, as warranted. Dates detailed in Table 3.2-1 may not correspond to dates noted in the heritage resource setting (Section 5.1). The reason for this discrepancy is that additional time was spent in the field with Aboriginal participants for mobilization and demobilization to study areas, pre-field work meetings, wrap up meetings and to evaluate alternate routes.

The methods used to determine how participants were to be involved in Project field surveys were common to all Aboriginal communities. Each field survey was discussed with the community, usually with

staff from the lands department. This discussion included the details regarding the type of work to be conducted, the timing and the proposed locations. Based on the described field work to be conducted, the Aboriginal communities chose their own members who would participate in each program. The participating Aboriginal communities are listed in Table 3.2-1 from east to west in relation to the Project.

TABLE 3.2-1

ARCHAEOLOGICAL FIELD STUDY PARTICIPATION FOR THE PROJECT

Aboriginal Community	Dates	Follow-Up Results Review
Edmonton to Hinton Segment		
Saddle Lake Cree Nation	May 22 to 31, 2013 June 10 to 19, 2013	November 28, 2013
Alexander First Nation	May 22 to 31, 2013 June 5 to 19, 2013	November 28, 2013
Samson Cree Nation	May 22 to 31, 2013 June 5 to 19, 2013	November 28, 2013
Ermineskin Cree Nation	May 22 to 31, 2013 June 5 to 19, 2013	October 31, 2013
Montana First Nation	May 22 to 31, 2013 June 5 to 12, 2013	November 28, 2013
Louis Bull Tribe	May 24 to 31, 2013	November 28, 2013
Alexis Nakota Sioux First Nation	May 22 to 31, 2013 June 5 to 19, 2013	To be determined
Paul First Nation	May 24 to 31, 2013 June 10 to 19, 2013	November 8, 2013
Nakcowinewak Nation of Canada	July 4 to 8, 2013 July 16 to 19, 2013	November 25, 2013
Sunchild First Nation	May 22 to 31, 2013 June 10 to 19, 2013 July 3 to 8, 2013 July 16 to 22, 2013	November 28, 2013
Black Pines to Hope Segment		
Lower Nicola Indian Band	July 26, 2013	November 28, 2013
Nicola Tribal Association	July 26, 2013	November 28, 2013
Hope to Burnaby Segment		
Chawathil First Nation	July 31, 2013	November 28, 2013

A Band Counsel Resolution was received by Trans Mountain, which delegated authority to the Nicola Tribal Association to act on behalf of Nooaitch Indian Band, Nicomen Indian and Shackan Indian Band for Project engagement.

During the field surveys, traditional methods of resource procurement were discussed, as well as modern methods currently employed. Seasonality of resource harvesting was also important information shared by the Aboriginal participants. Geographical locations were identified, as were areas that are not used and the reasons why. Potential mitigation measures to reduce any Project-related effects on a resource were also discussed during the archaeological field surveys. Open discussions occurred regularly between participants and archaeologists regarding the resources present and available to Aboriginal communities. These discussions were important to help build relationships among the field crews. Aboriginal participants spoke about aspects of the environment that were important to them and the importance of the resource from a western science perspective was also discussed. The TEK collected during the archaeological field surveys has added results that western science may not have gathered or considered, confirmed results that had been collected through the field surveys, as well as identified and confirmed issues of concern to be addressed in the ESA. The TEK collected is also used to assist in the review of potential Project-related effects on heritage resources.

3.2.2.5 Socio-Economic Interviews

Socio-economic engagement with participating Aboriginal communities occurred in parallel with Trans Mountain's Aboriginal Engagement Program. Activities included one-on-one meetings with leaders and staff members, and meetings, interviews and discussions with people living in the area. Additionally, while TLU studies have been initiated separately from the socio-economic assessment and TEK was provided and recorded during the various environmental field studies, it is often the case that information related to socio-economic elements (*e.g.*, cabin locations, resource use and employment and economy concerns) is provided during the meetings and discussion associated with TLU and TEK. As a result, information made available from the non-confidential TLU study reports and the TEK discussions as it relates to the socio-economic elements has been incorporated into the socio-economic assessment.

Trans Mountain also provided funding to assist Aboriginal communities that elected to conduct their own community directed socio-economic data collection. These communities often engaged other consultants to provide technical support and assistance with their socio-economic data collection for the Project.

TERA has prepared a separate Socio-Economic Technical Report that outlines Trans Mountain's information collection efforts for the assessment of potential adverse effects of the Project on socio-economic elements (Volume 5D). Volume 5D also provides a description of how socio-economic interviews and third-party socio-economic studies were developed for each interested Aboriginal community. The socio-economic information collected has been incorporated into the Socio-Economic Technical Report and used to assist in the assessment of the potential effects of the Project.

Appendix A of Volume 3B provides a summary of the meetings and interviews that took place for the socio-economic component of the ESA. The issues that were raised and where they are considered in the socio-economic assessment are also summarized in Table 3.2-2.

3.2.2.6 Economic Development

One of the goals of Aboriginal Engagement Program is to work collaboratively with Aboriginal communities to support access to economic development opportunities that will arise from the Project. These include employment and procurement opportunities and, where possible, education, training and community investments to maximize access to these opportunities. To identify procurement prospects, Project staff work with Aboriginal communities to identify Aboriginal businesses that are interested in contracting opportunities. Trans Mountain has developed, in partnership with KMC's procurement team, an Aboriginal Procurement Policy to provide guidance and allowances for facilitating Aboriginal participation in the Project.

With regard to employment, Trans Mountain recognizes that the fast growth rate of Aboriginal population will have a substantial effect on the available workforce in the future and there is a need for proactive program development in the areas of education and training to support employment opportunities. Through the Aboriginal Engagement Program, employment opportunities are being shared with each Aboriginal community and a capacity inventory for employment within the communities is being encouraged. The content will then be used for the realization of employment benefits with both Trans Mountain and prime contractors during the Project. In partnership with KMC, Trans Mountain has worked with Aboriginal communities regarding the Youth Summer Work Project at the Burnaby terminal. Three youths were hired during the summer of 2013, two from Kwikwetlem First Nation and one from Kwantlen First Nation.

Regarding Education and Training, the Project dedicates staff to work with Aboriginal communities to identify workforce development opportunities and enhance skill development related to the Project. Trans Mountain's Aboriginal Peoples' Training Policy is focused on creating initiatives that increase the long-term capability for Aboriginal people to participate in the economy and to share in the success of the Project. In partnership with the First Nation Emergency Services Society, Trans Mountain has engaged with a number of Aboriginal communities in BC to pilot an emergency response training program. Approximately 40 participants took part in the training in July and August, 2013.

Community Investment, through the Aboriginal Engagement Program, takes the form of sponsorships, cultural events and festivals, cultural awareness workshops and other community development initiatives. Specific to the Project, Trans Mountain will work with Aboriginal communities to support areas of importance that will drive benefits to the community pre-construction, during and post-construction.

Through the creation of partnerships and shared goals between Trans Mountain and Aboriginal communities, economic development will take place and all parties can work towards achieving mutually-beneficial Project-based or long-term goals.

3.2.3 Summary of Outcomes of the Aboriginal Engagement Program for Socio-Economic Elements

The results of engagement have helped refine the ESA for the Project. With this information, Trans Mountain identified issues, addressed concerns and responded to questions. Engagement has also provided Aboriginal communities with an understanding of the Project.

Although a wide range of issues were raised by community members and representatives throughout the Aboriginal engagement process, recurring themes have emerged, including the following:

- potential environmental effects of spills on land and in water and the related effects to traditional activities;
- potential construction and operation effects on traditional hunting and fishing areas, gathering areas, sacred sites and heritage resources;
- need to resolve historical issues first, before participating in the Project review;
- need for Project-related employment, skills development, contracting opportunities on both the existing and proposed expansion systems;
- additional economic incentives including preferred procurement opportunities, revenue sharing, community enhancement opportunities and equity participation; and
- ongoing respectful and meaningful engagement including participation in environmental field studies, capacity funding and TLU study funding.

Results of the engagement have been considered and incorporated throughout the socio-economic assessment, where relevant, including the effects assessment and mitigation and enhancement measures. The issues identified by participating Aboriginal communities through engagement activities for the Project are described in Table 3.2-2. References to where these issues are considered in the application are also provided Table 3.2-2. Detailed information on engagement activities conducted and opportunities provided for Project input to date with each Aboriginal community is presented in Appendix A of Volume 3B.

3.2.4 Future Aboriginal Engagement Activities

Following submission of the application to the NEB, including the ESA, Trans Mountain will continue engagement with Aboriginal communities to provide updates on the status of the Project and discuss proposed mitigation and enhancement measures. Information updates will continue to be sent to Aboriginal communities. From information sharing to continued environmental field studies to address interests and concerns, Trans Mountain is committed to the continuation of an effective engagement program that satisfies all parties. The outcomes of meetings and remaining TLU study engagement efforts will be documented and filed with the NEB (see Section 9.0). As described in Volume 3B, Trans Mountain will continue engagement through the regulatory process and Project development and operations. Trans Mountain will also continue its liaison with the Crown and provide updates regarding Trans Mountain's engagement activities with Aboriginal communities potentially affected by the Project.

TABLE 3.2-2

SUMMARY OF INTERESTS OR CONCERNS IDENTIFIED THROUGH ENGAGEMENT ACTIVITIES WITH ABORIGINAL COMMUNITIES FOR THE PROJECT

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Effects to archaeological artifacts	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Ermineskin Cree Nation Montana First Nation Louis Bull Tribe Alexis Nakota Sioux Nation Nakcowinewak Nation of Canada Paul First Nation Sunchild First Nation Aseniwuche Winewak Nation Simpcw First Nation Canim Lake Band Lower Nicola Indian Band Yale First Nation Chawathil First Nation Shx'ow'hamel First Nation Cheam First Nation Seabird Island Band Popkum First Nation	Trans Mountain is conducting studies along the proposed pipeline corridor to gather data for the environmental and socio-economic assessment. This assessment will consider: the potential environmental and socio-economic effects of the construction, operations and maintenance of the pipeline; ways in which these effects can be minimized or avoided altogether; and mitigation and reclamation strategies that will further reduce these effects. Overall, Project-related effects on heritage resources are being addressed in the ESA. This will include development of mitigation measures to reduce effects related to archaeological, palaeontological and historical sites. Trans Mountain will follow any conditions or recommendations identified in the permits for the HRIA for Alberta and AIA for BC. In the event archaeological, palaeontological or historical sites are discovered during construction, follow the contingency measures identified in the Heritage Resources Discovery Contingency Plan (Appendix B of Volume 6B). No work at that particular location shall continue until permission is granted by the appropriate regulatory authority. Further discussion is provided under heritage resources in Section 7.2.1.	Volume 5B Sections 7.2.1 and 7.2.4 Volume 6B Volume 6C
Effects on known sacred sites and burial sites	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Ermineskin Cree Nation Montana First Nation Louis Bull Tribe Alexis Nakota Sioux Nation Paul First Nation Sunchild First Nation Aseniwuche Winewak Nation Simpcw First Nation Lower Nicola Indian Band Ts'elxweyeqw Tribe Management Limited Yale First Nation Shx'ow'hamel First Nation Seabird Island Band Popkum First Nation	Trans Mountain has facilitated TLU studies with potentially affected Aboriginal communities to gather data for the environmental and socio-economic assessment. This assessment will consider: the potential environmental and socio-economic effects of the construction, operations and maintenance of the pipeline; ways in which these effects can be minimized or avoided altogether; and mitigation and reclamation strategies that will further reduce these effects. Overall, Project-related effects on traditional land and resource use are being addressed in the ESA. An environmental education program (Volume 6A) will be developed and implemented to ensure that all personnel working on the construction of the Project are informed of the location of known sacred sites and burial sites. All sensitive resources identified on the Environmental Alignments Sheets (Volume 6E) and environmental tables within the immediate vicinity or the right-of-way will be clearly marked before the start of clearing. In the event that previously unidentified sacred sites are discovered during clearing or construction measures outlined in the Traditional Land Use Sites Discovery Contingency Plan (Appendix B of Volume 6B) will be implemented. Further discussion is provided under traditional land and resource use in Section 7.2.2.	Volume 5B Section 7.2.2 Volume 6A Volume 6B Volume 6E

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Capacity Funding	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Métis Nation of Alberta (Region 4) Louis Bull Tribe Alexis Nakota Sioux Nation Paul First Nation Sunchild First Nation Simpcw First Nation Lower Nicola Indian Band Nooaitch Indian Band Pacheedaht First Nation Yale First Nation Shx'ow'hamel First Nation Scowlitz First Nation Semiahmoo First Nation	Trans Mountain is committed to ongoing respectful and meaningful engagement. Trans Mountain provides funding, as appropriate, to Aboriginal communities and Aboriginal groups who have an interest in the Project and who wish to engage in the Aboriginal Engagement Program. Ongoing TLU studies supported by the Project and any mutial benefit agreements established between Trans Mountain and Aboriginal communities may also contribute to and support broader Aboriginal community cultural objectives.	Volume 3B

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Employment opportunities	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Métis Nation of Alberta (Region 4) Ermineskin Cree Nation Montana First Nation Louis Bull Tribe Paul First Nation Sunchild First Nation Lheidli T'enneh Simpcw First Nation Neskonlith Indian Band Lower Nicola Indian Band Ts'elxweyeqw Tribe Management Limited Yale First Nation Shx'ow'hamel First Nation Popkum First Nation	One of the goals of Aboriginal Engagement Program is to work collaboratively with Aboriginal communities to support access to economic development opportunities that will arise from the Project. These include employment and procurement opportunities and, where possible, education, training and community investments to maximize access to these opportunities. To identify procurement prospects, Project staff work with Aboriginal communities to identify Aboriginal businesses that are interested in contracting opportunities. Trans Mountain has developed, in partnership with KMC's procurement team, an Aboriginal Procurement Policy to provide guidance and allowances for facilitating Aboriginal participation in the Project. With regard to employment, Trans Mountain recognizes that the fast growth rate of Aboriginal population will have a substantial effect on the available workforce in the future and there is a need for proactive program development in the areas of education and training to support employment opportunities. Through the Aboriginal Engagement Program, employment opportunities are being shared with each Aboriginal community and a capacity inventory for employment within the communities is being encouraged. The content will then be used for the realization of employment benefits with both Trans Mountain and prime contractors during the Project. The Trans Mountain Aboriginal engagement team continues to communicate with Aboriginal communities along the proposed pipeline corridor to identify education, training, employment and procurement opportunities. Trans Mountain will: • maximize the hiring of on-reserve and off-reserve Aboriginal community members; • liaise with communities, appropriate resources and with contractors; • initiate an Aboriginal Employment and Training Program to support increased access to Aboriginal employment opportunities on the Project; • develop a mentorship program for Aboriginal workers to encourage work site integration and retention; • evaluate contractors' recruitment and selection processes to ensure opportunities will be available to Aboriginal workers; and • ensure contractors communicate upcoming employment opportunities directly to Project area employment offices, women's organizations and Aboriginal communities and organizations on a timely basis. Trans Mountain will continue to collaborate with regional training providers to identify ongoing opportunities to facilitate, support or participate in delivery of training for Aboriginal communities. Information will be provided in a timely manner to educators and governments about the types of Project-related jobs that will be available, and the required skills and qualifications, to assist training providers in developing and implementing appropriate training. Trans Mountain will work with contractors and labour organizations to encourage contractors to provide training and apprenticeship opportunities related to the work they perform, including opportunities for on-the-job training on the Project. The Project will collaborate with training providers to provide job preparation and Project specific training to Aboriginal residents. All training programs that are supported by the Project will be mutually agreeable with particular training providers. Trans Mountain's Aboriginal Peoples' Training Policy is focused on creating initiatives that increase the long-term capability for Aboriginal people to participate in the economy and to share in the success of the Project. Community Investment, through the Aboriginal Engagement Program, takes the form of sponsorships, cultural events and festivals, cultural awareness workshops and other community development initiatives. Specific to the Project, Trans Mountain will work with Aboriginal communities to support areas of importance that will drive benefits to the community pre-construction, during and post-construction. Through the creation of partnerships and shared goals between Trans Mountain and Aboriginal communities, economic development will take place and all parties can work towards achieving mutually-beneficial Project-based or long-term goals. Further discussion is provided in Section 7.2.7 Employment and Economy.	Volume 3B Volume 5B Section 7.2.7
Preferred procurement opportunities	Alexander First Nation Ermineskin Cree Nation Sunchild First Nation Simpcw First Nation Shx'ow'hamel First Nation Popkum First Nation Semiahmoo First Nation Kwantlen First Nation		
Educational opportunities	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Métis Nation of Alberta (Region 4) Foothills Ojibway First Nation Paul First Nation Sunchild First Nation Lower Nicola Indian Band Simpcw First Nation Ts'elxweyeqw Tribe Management Limited Yale First Nation Popkum First Nation Scowlitz First Nation Semiahmoo First Nation		

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Aboriginal monitors during construction	Enoch Cree Nation Métis Nation of Alberta (Region 4)	Aboriginal Monitors onsite through the construction of the Project will work with Environmental Inspectors to provide traditional knowledge to the construction program to ensure protection of the environment; to discuss upcoming traditional and western science elements with the Environmental Inspector to ensure protection and monitoring; and to monitor mitigation success in protecting the environment. Trans Mountain will continue to engage Aboriginal communities through all phases of the Project.	Volume 3B Volume 6A
Language barriers to engagement, employment, and education	Paul First Nation Nakcowinewak Nation of Canada	Trans Mountain understands that language barriers may limit Aboriginal peoples' employment opportunities. Trans Mountain considers employment readiness programs as an important training tool to reduce the barriers and provide increased access to employment or employment resources in general and for the Project.	Volume 3B
Effects on Aboriginal harvesting practices and subsistence living	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Métis Nation of Alberta (Region 4) Ermineskin Cree Nation Montana First Nation Louis Bull Tribe Alexis Nakota Sioux Nation Paul First Nation Nakcowinewak Nation of Canada Sunchild First Nation Aseniwuche Winewak Nation Simpcw First Nation Whispering Pines Clinton Indian Band Lheidli T'enneh Lhtako Dene Nation Canim Lake Band Nicola Tribal Association Lower Nicola Indian Band Yale First Nation Chawathil First Nation Shx'ow'hamel First Nation Ts'elxweyeqw Tribe Management Limited Popkum First Nation Cowichan Nation Alliance Chemainus First Nation Halalt First Nation Penelakut First Nation	Trans Mountain is conducting environmental studies along the proposed pipeline corridor to gather data for the environmental assessment. This assessment will consider the potential environmental effects of the construction, operations and maintenance of the pipeline; ways in which these effects can be minimized or avoided altogether; and mitigation and reclamation strategies that will further reduce these effects. Overall, Project-related effects on traditional land and resource use are being addressed in the ESA. An environmental education program will be developed and implemented to ensure that all personnel working on the construction of the Project are informed of the location of known TLU sites. All sensitive resources identified on the Environmental Alignments Sheets (Volume 6E) and environmental tables within the immediate vicinity or the right-of-way will be clearly marked before the start of clearing. Trans Mountain will: • provide Aboriginal communities with the anticipated construction schedule and proposed pipeline corridor maps, a minimum of two weeks prior to the start of construction in the vicinity of their respective communities; • install signage notifying of construction activities in the area; and • work with Aboriginal communities to develop strategies to most effectively communicate the construction schedule and work areas to its members. In the event that additional TLU sites are identified during ongoing engagement with Aboriginal communities prior to construction for the Project, the sites will be assessed and appropriate mitigation measures will be determined. Access will be managed, where required, along the Project where new temporary and permanent access is created for the construction and operation of the pipeline. To mitigate environmental effects associated with increased access, which could further lead to increased concentrations of hunting and fishing activities at previously unattainable locations, increased predation of wildlife, disturb reclamation efforts on sensitive terrain, and other anthropogenic disturbances, Trans Mountain will manage access along portions of its right-of-way where new access is/was created by implementing one or more of the mitigation measures to manage access during the pre-construction, construction and post-construction phases. Mitigation measures are provided in the Traffic and Access Control Management Plan (Appendix C of Volume 6B). Further discussion is provided under traditional land and resource use in Section 7.2.2.	Volume 5B Section 7.2.2 Volume 6A Volume 6B Volume 6E

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Effect on traplines/trapline owner notifications prior to construction	Saddle Lake Cree Nation Enoch Cree Nation Samson Cree Nation Ermineskin Cree Nation Montana First Nation Louis Bull Tribe Nakcowinewak Nation of Canada Sunchild First Nation Aseniwuche Winewak Nation Simpcw First Nation Shx'ow'hamel First Nation	Trappers of affected registered fur management areas and traplines and guide-outfitters in relevant wildlife management units will be contacted prior to clearing and construction activities. Maps and schedule information will be provided to enable them to select alternate areas for their activities. Compensation will be provided, considering various forms, to affected trappers according to established industry and provincial protocols if reduced fur harvest and lost revenue is proven. Vandalism or theft of trapper equipment or trapped animals will be prohibited if they are observed on the construction right-of-way or the construction site. Further discussion is provided under human occupancy and resource use in Section 7.2.4. Mitigation measures are provided in the EPPs (Volumes 6B and 6C).	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report Volume 6B Volume 6C
Effects on access for areas of habitation, agriculture or culturally important activities	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Montana First Nation Louis Bull Tribe Alexis Nakota Sioux Nation Paul First Nation Nakcowinewak Nation of Canada Sunchild First Nation Simpcw First Nation Lower Nicola Indian Band Yale First Nation Shx'ow'hamel First Nation Popkum First Nation Chawathil First Nation Le'qa:mel First Nation Kwantlen First Nation	The Traffic and Access Control Management Plan (Appendix C of Volume 6B) addresses the management of pipeline construction traffic and access along the construction right-of-way and temporary access routes. This plan also addresses the activities during pre-construction, construction (pipe installation) and construction clean-up and reclamation phases of the Project and provides guidelines for vehicular use on the construction right-of-way and associated access roads, as well as blocking and/or controlling access to previously inaccessible portions of the right-of-way following construction and throughout the operation phase of the Project. The intent of the mitigation is to reduce disturbances caused by access, construction equipment and vehicle traffic, during and following pipeline construction. The objectives of the Traffic and Access Control Management Plan will be accomplished by minimizing the development of access routes, controlling public access along the construction right-of-way, selecting appropriate access routes that cause the least disturbance to high quality, sensitive wildlife habitat, managing traffic on these routes and determining appropriate construction reclamation. Trans Mountain will work with applicable resource managers, traditional land and resource users to define locations where access control is necessary, and what type(s) of access control will be implemented. Trans Mountain will: • provide Aboriginal communities with the anticipated construction schedule and proposed pipeline corridor maps, a minimum of two weeks prior to the start of construction in the vicinity of their respective communities; • install signage notifying of construction activities in the area; and • work with Aboriginal communities to develop strategies to most effectively communicate the construction schedule and work areas to its members. Access will be managed, where required, along the Project where new temporary and permanent access is created for the construction and operation of the pipeline. To mitigate environmental effects associated with increased access, which could further lead to increased concentrations of hunting and fishing activities at previously unattainable locations, increased predation of wildlife, disturb reclamation efforts on sensitive terrain, and other anthropogenic disturbances, Trans Mountain will manage access along portions of its right-of-way where new access is/was created by implementing one or more of the mitigation measures to manage access during the pre-construction, construction and post-construction phases. Further discussion is provided under traditional land and resource use in Section 7.2.2. Mitigation measures are provided in the EPPs (Volumes 6B and 6C).	Volume 5B Section 7.2.2 Volume 6B Volume 6C

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Traffic and transportation	Enoch Cree Nation Paul First Nation Whispering Pines Clinton Indian Band Cowichan Nation Alliance Le'qa:mel First Nation	Speed limits that have been approved by Trans Mountain will be established on the construction right-of-way and access roads. Signs will be posted stating the applicable speed limits for construction traffic. An environmental education program will be developed and implemented. Environmental training will include the expectation that speed limits and signage, flagging and/or fences delineating the environmental features shall be respected at all times. Multi-passenger vehicles will be used for the transportation of crews to and from the job sites, to the extent feasible. Further discussion is provided under infrastructure and services in Section 7.2.5. Mitigation measures are provided in the Pipeline EPP (Volume 6B).	Volume 5B Section 7.2.5 Volume 6A Volume 6B
Increased need for waste management practices	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Ermineskin Cree Nation Montana First Nation Louis Bull Tribe Alexis Nakota Sioux Nation Paul First Nation Lower Nicola Indian Band Nakcowinewak Nation of Canada Sunchild First Nation Simpcw First Nation Yale First Nation Shx'ow'hamel First Nation Seabird Island Band Popkum First Nation	The Waste Management Standard outlines specific measures to be followed by all Trans Mountain employees and contractors involved with the construction of the Project. This plan is designed to ensure wastes generated by the Project are handled, stored and disposed of in an environmentally responsible manner, thereby maintaining ecological and cultural integrity. This Waste Management Standard will reduce the likelihood of an accidental release of potentially hazardous waste products into the environment during pipeline construction. The Waste Management Standard applies to all employees, contractors and consultants who conduct work on behalf of Trans Mountain during construction of the Project. All employees, contractors and consultants will abide by all federal, provincial and local requirements for the storage, handling, transport, disposal and spill reporting requirements of all waste materials that are potentially hazardous to the environment. Further discussion is provided under infrastructure and services in Section 7.2.5. Mitigation measures are provided in the EPPs (Volumes 6B, 6C and 6D).	Volume 5B Section 7.2.5 Volume 6B Volume 6C Volume 6D
Human safety and health	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Ermineskin Cree Nation Alexis Nakota Sioux Nation Paul First Nation Sunchild First Nation Nakcowinewak Nation of Canada Aseniwuche Winewak Nation Lheidli T'enneh Simpcw First Nation Lower Nicola Indian Band Whispering Pines Clinton Indian Band Yale First Nation Shx'ow'hamel First Nation Cheam First Nation Seabird Island Band Popkum First Nation Tzeachten First Nation	Pipeline safety is a common interest and a value shared by Trans Mountain. Safety is a top priority and at the core of who Trans Mountain is as a company. Dedicated staff work to maintain the integrity of the pipeline through maintenance, inspection and awareness programs. While no spill is acceptable to Trans Mountain, accidents can happen. Trans Mountain has a comprehensive response plan that includes working with local regulatory authorities to make sure the public and the environment are kept safe. Where the pipeline runs near schools, Trans Mountain is open to working with individual schools or districts to fully support their safety efforts and ensure their emergency response plans and Trans Mountain's are coordinated. Trans Mountain agrees that measures to protect sensitive environmental areas such as water bodies and riparian areas are critical. This is why Trans Mountain takes a multi-layered approach to pipeline safety, including taking measures such as strategically placed pipeline valves near waterways and drilled river crossings at some locations. Trans Mountain has comprehensive spill response plans in place for the Trans Mountain pipeline and facilities. These plans are constantly being updated to keep them current and are regularly practiced through deployment exercises. While the specific strategies used in response to a spill will vary depending on the circumstances, the primary objectives in all cases are to ensure safety and to minimize environmental damage. To ensure there are sufficient funds to remediate a spill, Trans Mountain is covered by insurance necessary to respond to all spills or releases from Trans Mountain's pipelines and facilities. Trans Mountain monitors the insurance program continuously and makes annual adjustments, as necessary, to ensure adequate coverage. Further discussion is provided under community health in Section 7.2.8. Mitigation measures are provided in the EPPs (Volumes 6B and 6C). Terrestrial spills are discussed in Volume 7.	Volume 5A Sections 5.0 and 7.0 Volume 5B Sections 5.3 and 7.2.8 Volume 5D Community Health Technical Report Screening Level Human Health Risk Assessment for Pipeline and Facilities Volume 6B Volume 6C Volume 7

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application
Noise pollution	Alexander First Nation Enoch Cree Nation Montana First Nation Alexis Nakota Sioux Nation Nakcowinewak Nation of Canada Sunchild First Nation Lheidli T'enneh Simpcw First Nation	Noise from construction of the Project has the potential to affect a variety of land users including users of parks and protected areas, Aboriginal traditional areas, residential areas and outdoor recreation areas. The potential effects on human receptors are not anticipated to extend beyond the Acoustic Environment local study area. Trans Mountain will ensure equipment is well-maintained during construction to minimize air emissions and unnecessary noise. Additionally, Trans Mountain will restrict the duration that vehicles and equipment are allowed to sit and idle to less than 1 hour unless air temperatures are less than 0°C. Trans Mountain recognizes that many regional changes have occurred since the pipeline was installed over 60 years ago including urban encroachment near some of its existing pump stations and terminals and is aware that noise during operations is of concern to nearby residents. Ambient sound surveys representative of sound levels at noise receptors and existing facilities were conducted and all noise level results were compared to Alberta Energy Regulator's *Directive 038 Noise Control* and the BC Oil and Gas Commission's *Noise Control Best Practices Guideline*. Standard mitigation plus noise-specific mitigation measures will be implemented. Further discussion is provided under acoustic environment in Section 7.2.6 of Volume 5A. Mitigation measures are provided in the Pipeline EPP (Volume 6B).	Volume 5A Sections 5.6 and 7.2.6 Volume 5B Section 5.4 and 7.2.4 Volume 5C Terrestrial Noise and Vibration Technical Report Volume 5D Socio-Economic Technical Report Volume 6B
Mature forest protection	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Ermineskin Cree Nation Montana First Nation Paul First Nation Sunchild First Nation Simpcw First Nation Lower Nicola Indian Band Yale First Nation Shx'ow'hamel First Nation Popkum First Nation	Discussions with BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) will be ongoing to discuss potential effects of the Project on Old Growth Management Areas. Mature forests are further discussed in managed forest areas under Section 7.2.4 HORU of Volume 5B. Mitigation measures are provided in the Pipeline and Facilities EPPs (Volumes 6B and 6C).	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Managed Forests Areas and Forest Health Technical Report Volume 6B Volume 6C
Salvageable timber to communities	Enoch Cree Nation Montana First Nation Louis Bull Tribe Paul First Nation Nakcowinewak Nation of Canada Sunchild First Nation Shx'ow'hamel First Nation	Trees, stumps, brush and other vegetation will be cleared from the construction right-of-way; temporary work sites; and permanent facilities that are not located on existing TMPL previously cleared easements. Timber harvesting and/or land clearing and debris disposal activities will be coordinated according to Provincial legislation or agreements. Trans Mountain will apply all mitigation measures pertaining to timber outlined in the Timber Salvage Management Plan of the Pipeline EPP (Volume 6B).	Volume 6B
Engagement or consultation process	Saddle Lake Cree Nation Enoch Cree Nation Alexander First Nation Samson Cree Nation Paul First Nation Sunchild First Nation Simpcw First Nation Lower Nicola Indian Band Yale First Nation Popkum First Nation	Since April 2012, Trans Mountain has engaged with Aboriginal communities that may be affected by the Project based on their assertion of traditional and cultural use of resources to maintain a traditional lifestyle. Trans Mountain respects the Aboriginal and treaty rights, unique culture, diversity, languages and traditions of Aboriginal people. Trans Mountain acknowledges the importance of teaching, the significance of culture and language and the considerable traditional knowledge that has been passed on for generations and as such is committed to continued listening, learning and working with Aboriginal people to ensure that knowledge and advice is considered and incorporated in the Project. The Aboriginal Engagement Program is based on mutual respect, timeliness, accountability and transparency in order to build positive and productive relationships for the long-term. Further discussion is provided in Volume 3B.	Volume 3B

TABLE 3.2-2 Cont'd

Summary of Interest or Concern	Aboriginal Community	Response Summary[1]	Where Issue is Addressed in the Application

Emergency response protocol	Enoch Cree Nation
	Samson Cree Nation
	Whispering Pines Clinton Indian Band
	Cowichan Tribes
	Yale First Nation
	Chawathil First Nation
	Scowlitz First Nation
	Tzeachten First Nation
	Matsqui First Nation
		• Pipeline safety is a common interest and a value shared by Trans Mountain. Trans Mountain has heard some specific questions about the pipeline and its safe operation near homes and schools and welcomes any opportunity to provide information and respond to questions.
		• Safety is a top priority and at the core of who Trans Mountain is as a company. Dedicated staff work to maintain the integrity of the pipeline through maintenance, inspection and awareness programs. While no spill is acceptable to Trans Mountain, accidents can happen.
		• Trans Mountain has a comprehensive response plan that includes working with local regulatory authorities to make sure the public and the environment are kept safe. Where the pipeline runs near schools, Trans Mountain is open to working with individual schools or districts to fully support their safety efforts and ensure their emergency response plans and Trans Mountain's are coordinated.
		• Trans Mountain will implement the following mitigation measures regarding emergency response:
		  • consult with emergency response agencies and municipal emergency planners regarding ERPs, as required, to ensure understanding of potential Project-related service needs;
		  • provide key Project contact numbers, proposed pipeline corridor maps, the construction schedule and emergency response program information to local and regional police services, fire departments and medical/health services;
		  • provide appropriate levels of security at camps and worksites. This will minimize the potential for external events to impact Project personnel, at the same time reducing diversion of emergency services from regional residents;
		  • to reduce response requirements related to Project worker/community integrations, develop a Code of Conduct for employees and contractors that provides guidance and policies on appropriate and inappropriate worker behaviour and community interactions;
		  • to reduce response requirements related to Project worker/community integrations, adhere to a policy of no tolerance of use or being under the influence of illicit drugs or alcohol during work hours; and
		  • develop and implement an issues tracking process to monitor and respond to Project-related socio-economic issues and opportunities that emerge during construction and reclamation.
		Further discussion is provided in Volume 4C and mitigation measures are provided in the Pipeline EPP (Volume 6B).
			Volume 4C
			Volume 5B
			Section 7.2.3
			Volume 6B

Note: 1 Detailed mitigation measures are outlined in the Project-specific EPPs (Volumes 6B, 6C and 6D).

3.3 Landowner Relations

The primary objectives of the landowner relations program were to introduce the Project to landowners and occupants and obtain approval for land access on a timely basis to support required engineering and environmental surveys. Over the long-term, the program objectives are obtaining landowner understanding, acceptance and land rights for survey, construction, restoration, and transition to operations. This approach also serves to preserve good relationships that currently exist and reinforce positive relations into operations.

Land stakeholder groups include private landowners, freehold and Crown occupants, and public landowners (federal, provincial, and municipal). Landowner issues include land rights, compensation, land-specific construction and restoration activities, as well as broader Project and policy issues. The program will attempt to engage all appropriate internal groups where necessary to address issues and concerns effectively.

Trans Mountain designed the program with the following objectives:

- introduce the Project to landowners in a manner that establishes a basis for a positive ongoing working relationship;
- support engineering and environment disciplines in determining Project routing and facility configuration by obtaining landowner survey consent;
- develop the Land Program Strategy to guide land rights acquisition;
- acquire necessary land rights to enable the Project to be constructed and placed into operation;
- obtain necessary third-party crossing approvals to enable the Project to be constructed safely;
- provide support to the regulatory applications and the regulatory process for the Project;
- support construction and restoration activities, including post-construction damage settlements; and
- transfer Project land information and landowner files to Trans Mountain Operations.

Trans Mountain recognizes the program must adapt to the needs of landowners and the Project, therefore, Trans Mountain will continuously review and assess the program to ensure that it is being conducted in the most effective and efficient manner.

3.3.1 Design of Program

Trans Mountain and its land agents began implementing the program in April 2012, and it continues to be an ongoing process. Internal processes within the program continue to evolve to better support the Project and in response to changes within engineering, environmental and operational functions. A detailed description of the program is provided in Volume 3C.

3.3.1.1 Landowner Notification

Trans Mountain identified a proposed pipeline corridor of generally 150 m width along the entire length of the Project. The corridor typically follows the TMPL system right-of-way, however, deviations have been identified as necessary. A land titles search to confirm the land and interest ownership was then initiated for lands within the proposed pipeline corridor. As the Project route is finalized, additional landowners and occupants may be identified; contact with newly identified landowners and occupants will be consistent with the format identified in Section 1.3.3 of Volume 3A.

Notification of Landowners

Trans Mountain and its land agents commenced the program in April 2012 and it continues to be an ongoing process. To ensure that Trans Mountain introduced the Project to landowners along the existing

system, an initial contact letter (Volume 3C) was sent to all 2,390 landowners. An additional letter was hand delivered to all urban residents along the TMPL system right-of-way in Edmonton, Alberta, and the BC Lower Mainland in August 2012 to inform the residents that Trans Mountain intended to pursue alternative routing in their communities.

Notification of Crown Occupants

A mail out was conducted with select Crown tenure holders with interests crossed by the proposed pipeline corridor who had not been contacted via other methods (*e.g.*, through the lands team or other disciplines on the assessment team). The mail out process was designed to provide an opportunity for the selected tenure holders (*e.g.*, agricultural tenure holders, commercial recreation tenure holders, guide-outfitters and registered trap line tenure holders) to identify key concerns related to Project activities and/or provide feedback on land/resource use patterns that may be affected.

3.3.1.2 Consultation and Survey Consent

The program uses a direct contact approach as it enables Trans Mountain's land agents to personally provide information to landowners and occupants about the Project and proposed studies. It also provides landowners and Crown occupants an opportunity to ask questions and identify concerns about the Project or the TMPL. These questions and concerns are passed on to the Project team. Trans Mountain's intention is to provide response to each landowner or occupant's concern or issue. The process has begun and will continue through all phases of landowner and occupant engagement.

Landowners and occupants located within the proposed pipeline corridor and likely to be directly affected by the Project were requested to provide consent for engineering and environmental study. Requests were usually made face-to-face and written or verbal consent was accepted.

Along this corridor, 1,325 landowners and 295 Crown rights holders in Alberta were contacted. In BC, 4,013 landowners and 615 Crown rights holders and pending land purchasers were contacted (Table 3.3-1).

TABLE 3.3-1

LANDOWNERS AND OCCUPANTS WITHIN THE PROPOSED PIPELINE CORRIDOR

Group	Alberta	BC	Total
Private Landowners	1,325	4,013	5,338
Crown Occupants and Pending Purchasers	295	615	910
Total	1,620	4,628	6,248

The approach provided an opportunity to collect information on aspects of the land which could be helpful in defining a route or potential effects of the Project on the socio-economic environment.

Communication with landowners and occupants is ongoing and questions or concerns will continue to be addressed throughout the life of the Project.

3.3.1.3 Corridor Survey Limitations

Landowners and Occupants

Some landowners and occupants refused to provide consent for surveys. Surveys were not completed on those respective land parcels. The occurrences of refusal are intermittently distributed throughout the length of the Project.

The reasons, when provided, varied substantially. Where opportunities existed, an agent revisited the landowner or occupant to verify their position or determine if circumstances had changed that would allow provision of consent.

Some landowners and occupants consented to survey but such surveys were to be restricted to the TMPL right-of-way only. Areas between the right-of-way and the proposed pipeline corridor boundaries were not accessible.

BC Provincial Parks

Application was made to BC Parks in December 2012 for an Education and Research Park Use Permit to conduct environmental studies within BC Parks. In June 2013, BC Parks requested the application be revised and re-submitted for only intrusive types of surveys (*e.g.*, ground disturbances and electro-fishing). With permission from BC Parks, certain non-intrusive studies have been conducted on some Park lands. The Education and Research Park Use permit application was received on November 15, 2013.

Indian Reserves

The TMPL crosses 15 Indian Reserves and the Aboriginal engagement team is involved in various stages of negotiation with each of the respective Aboriginal communities. Some Aboriginal communities have provided explicit consent for surveys, while others are anticipated to provide a decision on the matter in the near future.

Tk'emlúps Te Secwépemc

Tk'emlúps Te Secwépemc requested Trans Mountain to defer environmental field studies on traditional lands until Tk'emlúps Te Secwépemc was prepared to participate. The request affected studies within the corridor from the proposed Black Pines Pump Station in BC (reference kilometre [RK] 811.9) to Trans Mountain's Stump Pump Station (RK 862.7). Trans Mountain respected their request and postponed studies in June 2013 and part of July 2013. Further delay would result in lost study opportunities due to seasonal effects, therefore, with permission from Tk'emlúps Te Secwépemc, Trans Mountain resumed environmental studies on the traditional lands.

3.3.1.4 Land Acquisition

Section 5.4 of Volume 2 provides a detailed description of Land Acquisition.

3.3.1.5 Ongoing Relations

Trans Mountain will remain in contact with affected landowners and occupants throughout the Project life. Questions or concerns regarding the Project will be addressed as they arise. Once system operations commence, all landowner information will be transferred to Trans Mountain operations as the permanent record of land data.

3.3.2 Summary of Outcomes of the Public Consultation Program as it Relates to Socio-economic Elements

The data presented in this subsection was collected from April 2012, to July 31, 2013. Updates from the program will be filed with the NEB as updates when requested.

Landowner meetings comprised discussions about the Project in general as well as requests for consent for Project-specific surveys. The meetings also provided an opportunity for landowners to ask questions and identify concerns regarding the Project. Tables 3.3-2 to 3.3-5 provide information on the key topics relating to the socio-economic assessment and where these topics are addressed in the application.

3.3.2.1 Social and Cultural Well-Being

TABLE 3.3-2

INTERESTS OR CONCERNS RELATED TO SOCIAL AND CULTURAL WELL-BEING

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Town representatives have concerns about vandals	In areas where there may be a concern regarding the safety of the public, restricted areas are established. Trans Mountain will have a construction site safety and security plan in place and it will be communicated to the town representatives and adjacent residents. The influx of workers into communities and the potential effects on community way-of-life are discussed under social and cultural well-being in Sections 5.3 and 7.2.3 as well as under community health as it relates to public safety in Sections 5.8 and 7.2.8.	Volume 5B Sections 5.3, 5.8, 7.2.3 and 7.2.8 Volume 5D Socio-Economic Technical Report Community Health Technical Report
Concern about the effects of the Project on people's personal lives (*e.g.*, there has been a notable increase in loss of privacy, rules and regulations and a significant curtailing of what they are allowed to do on their own property)	Every effort is made to minimize effects on landowners. Through respectful dialogue, Trans Mountain's goal is to negotiate mutually-agreeable arrangements with each landowner who may be affected by the Project. In cases where Trans Mountain is unable to reach a mutually-agreeable arrangement, the NEB has a multi-step process that Trans Mountain will follow to address differences of opinions as part of the routing review and approval process. More information about the process from the NEB is available here: www.neb-one.gc.ca/clf-nsi/rthnb/pblcprtcptn/pplnrgltncnd/pplnrgltncnd_ndx-eng.html Pipeline Regulation in Canada: A Guide for Landowners and the Public. Community way-of-life (including as community perspectives of an oil pipeline) is discussed under social and cultural well-being in Sections 5.3 and 7.2.3 of Volume 5B.	Volume 5B Sections 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report
Disturbance to golf course	Trans Mountain is evaluating feasible route alternatives in order to reduce effects to golf courses and other recreational activities along the proposed pipeline corridor. Overall, Project-related effects on recreation use are being addressed in the ESA. This will include development of mitigation measures to reduce effects and optimize opportunities to enhance recreational use. Trans Mountain is evaluating ways to reduce the effects to golf courses potentially encountered along and close to the proposed pipeline corridor. Golf courses are considered a community asset which contribute to community way-of-life and are discussed under social and cultural well-being in Sections 5.3 and 7.2.3.	Volume 5B Sections 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report

TABLE 3.3-2 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Disturbance to school yards	Where practical, the alignment of the TMEP route will parallel the existing TMPL. Alternate routes for the proposed expanded pipeline may be necessary — especially in areas where land use has changed since the pipeline was built nearly 60 years ago. In communities where routing may deviate from the existing TMPL right-of-way, Trans Mountain will discuss and apply routing considerations and decision-making criteria in discussions with local stakeholders. Where practical, the route for the proposed expanded pipeline will remain along the existing TMPL right-of-way. Where land use has changed since the pipeline went into operation in 1953, there may be a need to route parts of the new line away from the existing TMPL right-of-way. In these cases, Trans Mountain will look at alternatives through comprehensive routing studies in combination with its consultation process. To minimize effects to the urban landscape and landowners, the proposed route of the new pipeline would follow existing linear infrastructure, such as municipal streets or highway, railway or utility corridors, or in some cases parklands. It is important to understand that while the pipeline may be near homes and schools, it does not run under any buildings. Living or being active near a pipeline does not pose a health risk. There are community trails, sporting events, community gardens and all kinds of businesses and agricultural activities safely co-existing near the TMPL. Trans Mountain will continue to engage and communicate with communities as new information becomes available. Trans Mountain will continue to contact landowners along the existing TMPL right-of-way, and when route alternatives are selected, Trans Mountain will work with landowners to identify mutually agreeable solutions to concerns. The landowner concerns regarding the route and potential effects of the Project to their land will be taken into consideration during detailed design and construction planning activities. Details will be communicated with the landowner. A discussion of routing principles and selection of the proposed pipeline corridor is provided in Section 4.0. Schools are considered community assets that contribute to community way-of-life and are discussed under social and cultural well-being in Sections 5.3 and 7.2.3.	Volume 5B Sections 4.0, 5.3 and 7.2.3 Volume 5D Socio-Economic Technical Report

3.3.2.2 Human Occupancy and Resource Use

TABLE 3.3-3

INTERESTS OR CONCERNS RELATED TO HUMAN OCCUPANCY AND RESOURCE USE

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Disturbance to agricultural land use (crops, grazing areas, livestock, farm facilities) Heat from pipelines affecting crops	Through respectful dialogue, Trans Mountain's goal is to negotiate mutually-agreeable arrangements with each landowner who may be affected by the Project. In cases where Trans Mountain is unable to reach a mutually-agreeable arrangement, the NEB has a multi-step process that Trans Mountain will follow to address differences of opinions as part of the routing review and approval process. More information about the process from the NEB is available here: www.neb-one.gc.ca/clf-nsi/rthnb/pblcprtcptn/pplnrgltncnd/pplnrgltncnd_ndx-eng.html. Pipeline Regulation in Canada: A Guide for Landowners and the Public. Trans Mountain is working with landowners to reduce the potential disturbance to agricultural lands and disruption of agricultural practices during construction. Representatives of Trans Mountain will address farming practices with landowners/tenants through the annual communication program. An Agricultural Management Plan has been developed to particularly reduce effects on agriculture, which includes measures related to weed management, re-seeding, soil compaction, livestock access, drainage and irrigation lines, management of crop disruption, and crop and productivity loss (Volume 6B). Handling of cattle will be planned with the landowner prior to construction. Agricultural land uses such as grazing pastures, field crops, organic and specialty crops (*e.g.*, blueberries, raspberries, nurseries) and livestock facilities are located along the proposed pipeline corridor. Trans Mountain is working with landowners to reduce the potential disturbance to agricultural lands and disruption of agricultural practices during construction. Appropriate mitigation (*e.g.*, soil handling, erosion control) and monitoring activities will be implemented during construction to maximize reclamation success. Additional special reclamation measures will be applied, as required, to return the disturbed areas to a stable and maintenance-free condition. As part of the proposed post-construction environmental monitoring (PCEM) program, Trans Mountain will monitor revegetation growth on the construction right-of-way and implement remedial measures where necessary (Volume 6A). Discussion of agricultural uses, including concerns related to soil temperature effects, is provided under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Agricultural Assessment Technical Report Volume 6A Volume 6B
Pipelines rising over time affecting deep tilling practices (agriculture)	Road levelling, landscaping and other changes to ground conditions after a pipeline has been installed (often decades after) can result in the depth of the ground cover changing over time. It is also recognized that changes to land uses may affect the existing and proposed pipelines. Trans Mountain will investigate depth of cover and future agricultural practices. If necessary, remediation plans will be developed. Discussion of agricultural uses is provided under HORU in Sections 5.4 and 7.2.4.	
Effects on organic farming	Mitigation that addresses equipment cleaning, the restriction of herbicides for weed management, disposal of construction materials and garbage and soil management considerations have been identified within the Agricultural Management Plan for construction on organic fields (Volume 6B). Additionally, the Pipeline EPP provides mitigation practices for crossing organic farms. Maintenance practices will also recognize sensitivity of organic farm operations. Discussion of agricultural uses, including concerns related to organic farms, is provided under HORU in Sections 5.4 and 7.2.4.	
Proximity to residences/residential areas; disturbance of built features on residential properties (*e.g.*, garages, sheds, driveways, fences, landscaping)	The primary design objective is to construct the Project within the existing pipeline right-of-way, and where this is not possible, minimize any new linear disturbance. It is Trans Mountain's intention to find a route for the proposed pipeline which minimizes effects to residences and communities. The landowner's concern will be considered during design and routing activities. Where privately-held land is needed for the proposed new route, land agents from Trans Mountain will discuss proposed locations of the pipeline with landowners. Trans Mountain's goal is to reach mutually-acceptable agreements with landowners to allow Trans Mountain to build and maintain the proposed new pipeline. Trans Mountain will attempt to contact the landowner to collect information about future development plans for consideration of routing. Discussion of residential use is provided under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report

TABLE 3.3-3 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Disturbance to planned future residential or other developments.	Trans Mountain will contact the landowner to specifically collect information about future development plans for consideration of routing. Trans Mountain will advise the landowner of processes established for the protection of the pipeline, the public, and the environment. Compensation and damages will be addressed at an appropriate time. Land agent advised this could become an issue for access if the second pipeline is constructed. It would not allow semis and trailers to load/unload, which would result in lost revenue to the owner. Discussion of residential use areas is provided under HORU in Section 7.2.4.	Volume 5B Section 7.2.4 Volume 5D Socio-Economic Technical Report
Effects on land/property values	Trans Mountain appreciates the concern about loss of property values and has been investigating potential effects upon properties for sale – both with and without easements. To date, Trans Mountain's investigation has not shown a measurable effect, however, this situation will continue to be monitored. Trans Mountain appreciates that most homes with the existing pipeline were built after the pipeline was in-place and the easement would have been disclosed to the buyer at that time. Looking ahead to the proposed new pipeline, under the *NEB Act*, companies are required to compensate landowners for any new easement and pay for any damages and inconvenience associated with the new pipeline. Included within the determination of compensation is any change in the value of the property before and after the pipeline was built. Through respectful dialogue, Trans Mountain's goal is to negotiate mutually-agreeable arrangements with each landowner who may be affected by the Project. In cases where Trans Mountain is unable to reach a mutually-agreeable arrangement, the NEB has a multi-step process that Trans Mountain will follow to address differences of opinions as part of the routing review and approval process. More information about the process from the NEB is available here: www.neb-one.gc.ca/clf-nsi/rthnb/pblcprtcptn/pplnrgltncnd/pplnrgltncnd_ndx-eng.html Pipeline Regulation in Canada: A Guide for Landowners and the Public. The effects of the Project on housing prices in general will not be worked through the assessment of employment and economy in Section 7.2.7. However, factors that may be of concern to residential property owners/occupants are considered in various parts of the ESA including noise (Section 7.2.6 Acoustic Environment of Volume 5A), air quality (Section 7.2.4 Air Emissions of Volume 5A), sensory/visual disturbance (Section 7.2.4 HORU) and community way-of-life (Section 7.2.3 Social and Cultural Well-Being).	Volume 2 Section 5.0: Land Relations, Rights and Acquisition Volume 5A Sections 7.2.4 and 7.2.6 Volume 5B Sections 7.2.3, 7.2.4 and 7.2.7
Loss of aggregate/gravel resources	It is Trans Mountain's intention to find a route for the proposed pipeline which minimizes effects to landowners and communities. Where privately-held land is needed for the proposed new route, land agents from Trans Mountain will discuss proposed locations of the pipeline with landowners. Trans Mountain's goal is to reach mutually-acceptable agreements with landowners to allow Trans Mountain to build and maintain the proposed new pipeline. The NEB has produced a guide for landowners and the public that provides details about the regulatory process governing pipeline projects. This information is available on the NEB website www.neb-one.gc.ca/clf-nsi/rthnb/pblcprtcptn/pplnrgltncnd/pplnrgltncnd_ndx-eng.html Pipeline Regulation in Canada: A Guide for Landowners and the Public. Final pipeline alignment will be determined and assessed in respect to proximity to gravel reserves. Compensation will be assessed and negotiated at an appropriate time. Aggregate resources are discussed as part of the other land and resource use indicator under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4 Volume 5D Socio-Economic Technical Report

TABLE 3.3-3 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Tree removal; visual effects of the pipeline right-of-way	Trees, stumps, brush, and other vegetation will be cleared from the construction right-of-way, temporary work sites, and permanent facilities that are not located on existing, previously cleared easements. Timber and brush disposal options will be subject to agreements with landowners and appropriate government authorities. As Trans Mountain develops detailed design and engineering work, the ditches will be designed to protect sensitive areas and minimize effects that are identified in Trans Mountain's routing and design process. In the event that tree removal negatively affects landowners, TMEP will work with landowners to resolve concerns in a manner that meets technical standards and protects the safety of workers and the public. Every effort will be made to minimize effects to landowners. Public awareness campaigns will be undertaken to notify local communities when, where, and for how long construction and/or disturbances may take place. Trans Mountain is committed to industry accepted best practices in reclamation, always striving for opportunities leading to advancement. As with all of its construction projects, Trans Mountain will reclaim any areas that are affected by the proposed Project. Trans Mountain is committed to full reclamation of the pipeline right-of-way and surrounding areas following construction. Following construction, Trans Mountain aims to return the right-of-way to preconstruction conditions, to the extent possible. This could include adding new footpaths, developing new habitats, improving water crossings, or bettering migration corridors. Reclamation efforts could include the planting of native plant and grass species, riparian and wetland areas, wildlife habitats, and any other areas disturbed during construction. Post-construction environmental monitoring and ongoing right-of-way maintenance will continue following construction. Aesthetic attributes are discussed under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4 and 7.2.4
Disturbance to land use and access	One of Trans Mountain's objectives is to use, or abut, the existing right-of-way where practicable. The landowner concerns regarding the route and potential effects of the Project to their land will be taken into consideration during detailed design and construction planning activities. Details will be communicated with the landowner. A key objective is to treat each landowner fairly and equitably. For those who may be directly affected by the Project, Trans Mountain will identify and address landowners' concerns and questions about the Project. Trans Mountain will then work with the landowners to reach jointly equitable solutions for the Project. Access will be discussed with the landowner following design and construction planning. Primary road and railway crossings will be bored to minimize interference with existing activities and usage. A discussion of land uses is provided under HORU in Sections 5.4 and 7.2.4 while transportation infrastructure such as roads and railways are discussed under infrastructure and services in Sections 5.5 and 7.2.5.	Volume 5B Sections 5.4, 5.5, 7.2.4, and 7.2.5 Volume 5D Socio-Economic Technical Report
Noise/sensory disturbance	Ambient sound surveys representative of sound levels at noise receptors and existing facilities will be conducted and all noise level results have been compared to Alberta Energy Regulator's *Directive 038 Noise Control* and the BC Oil and Gas Commission's *Noise Control Best Practices Guideline*. Standard mitigation plus noise-specific mitigation measures will be implemented. Trans Mountain is committed to industry accepted best practices in reclamation, always striving for opportunities leading to advancement. As with all of its construction projects, Trans Mountain will reclaim any areas that are affected by the proposed Project. Trans Mountain is committed to full reclamation of the pipeline right-of-way and surrounding areas following construction. Following construction, Trans Mountain aims to return the right-of-way to pre-construction conditions, to the extent possible. This could include adding new footpaths, developing new habitats, improving water crossings, or bettering migration corridors. Reclamation efforts could include the planting of native plant and grass species, riparian and wetland areas, wildlife habitats and any other areas disturbed during construction. Post-construction environmental monitoring and ongoing right-of-way maintenance will continue following construction. Factors that may be of concern to residential property owners/occupants are considered in various parts of the ESA including noise (Section 7.2.6 Acoustic Environment of Volume 5A), air quality (Section 7.2.4 Air Emissions of Volume 5A), sensory/visual disturbance (Section 7.2.4 HORU) and community way-of-life (Section 7.2.3 Social and Cultural Well-being).	Volume 5A Sections 7.2.4 and 7.2.6 Volume 5B Sections 7.2.3 and 7.2.4 Volume 5C Terrestrial Noise and Vibration Technical Report Volume 5D Socio-Economic Technical Report

TABLE 3.3-3 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Disruption to businesses and/or business access construction	It is Trans Mountain's intention to find a route for the proposed pipeline, which minimizes effects to residences and communities. Where privately-held land is needed for the proposed new route, land agents from Trans Mountain will discuss proposed locations of the pipeline with landowners. Trans Mountain's goal is to reach mutually-acceptable agreements with landowners to allow Trans Mountain to build and maintain the proposed new pipeline. The primary design objective is to construct the Project within the existing pipeline right-of-way, and where this is not possible, minimize any new linear disturbance. Trans Mountain works with landowners along its pipeline network. A key objective is to treat each landowner fairly and equitably. For those who may be directly affected by the Project, Trans Mountain will identify and address landowners' concerns and questions about the Project. These lands teams will then work with the landowners to reach jointly equitable solutions. The NEB has produced a guide for landowners and the public that provides details about the regulatory process governing pipeline projects. This information is available on the NEB website www.neb-one.gc.ca/clf-nsi/rthnb/pblcprtcptn/pplnrgltncnd/pplnrgltncnd_ndx-eng.html Pipeline Regulation in Canada: A Guide for Landowners and the Public. Discussion of factors that may affect nearby residents, including local business owners, is provided under HORU in Sections 5.4 and 7.2.4.	Volume 5B Sections 5.4, and7.2.4 Volume 5D Socio-Economic Technical Report
Groundwater wells/artisan springs/aquifers	Trans Mountain will assess water quality and/or quantity changes to nearby groundwater which may result in adverse effects for other stakeholder or environmental receptors. Trans Mountain will review existing geological, hydrogeological and other information to determine potential hydrogeological conditions along the pipeline right-of-way and proposed facilities; GIS mapping and assessment strategies will be applied. TMEP will develop site-specific hydrogeological investigation activities that may include field verified surveys, hydraulic response testing, monitoring requirements and water quality parameter surveys. Trans Mountain's goal is to reach mutually-acceptable agreements with landowners to allow Trans Mountain to build and maintain the proposed new pipeline. Groundwater, including wells, is discussed under water quality and quantity in Section 7.2.3 of Volume 5A as well as under HORU in Sections 5.4 and 7.2.4.	Volume 5A Section 7.2.3 Volume 5B Sections 5.4 and 7.2.4 Volume 5C Groundwater Technical Report

3.3.2.3 Infrastructure and Services

TABLE 3.3-4

INTERESTS OR CONCERNS RELATED TO INFRASTRUCTURE AND SERVICES

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Need built up road surface over pipeline(s) for heavy equipment access Will roads be bored under?	The primary design objective is to construct the Project within the existing pipeline right-of-way, and where this is not possible, minimize any new linear disturbance. Primary road and railway crossings will be bored to minimize interference with existing activities and usage. Mitigation measures related to boreholes and potential effects (*e.g.*, topsoil salvage and replacement, borehole dewatering) are located in the Pipeline EPP (Volume 6B). Damage to foreign utilities during construction and operation is discussed in accidents and malfunctions Section 7.9. Discussion of transportation infrastructure is provided under infrastructure and services in Sections 5.5 and 7.2.5.	Volume 5B Sections 5.5, 7.2.5 and 7.9 Volume 5D Socio-Economic Technical Report Volume 6B
Effects on the town's water pump and reservoir	Potential effects will be assessed and mitigated as required. Water, including for human use, is discussed under water quality and quantity in Section 7.2.3 of Volume 5A as well as under infrastructure and services in Sections 5.5 and 7.2.5.	Volume 5A Section 7.2.3 Volume 5B Sections 5.5 and 7.2.5

TABLE 3.3-4 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Crossing of water and sewer lines.	The landowner concerns regarding the route and potential effects of the Project to their land will be taken into consideration during detailed design and construction planning activities. Details will be communicated with the landowner and Trans Mountain will work with the landowners to reach jointly equitable solutions. Damage to foreign utilities during construction and operation is discussed in accidents and malfunctions Section 7.9. Mitigation measures relating to hydrovacing and ramping over foreign utility lines are located in the Pipeline EPP (Volume 6B). Discussion of potential effects to infrastructure and services is provided in Sections 5.5 and 7.2.5.	Volume 5B Sections 5.5, 7.2.5 and 7.9 Volume 6B

3.3.2.4 Community Health

TABLE 3.3-5

INTERESTS OR CONCERNS RELATED TO COMMUNITY HEALTH

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Concern about safety in the event of a spill or any other incident	Trans Mountain has in place a comprehensive emergency preparedness and response program in accordance with the KMC EHS Policy and Section 32 of the NEB Onshore Pipeline Regulations. In the event of a release, and in addition to prevention measures, steps would be taken to minimize the consequence of a release by quickly shutting down and isolating the damaged section of the pipeline or facility. Trans Mountain has developed comprehensive emergency response procedures that control centre and local operators must follow. These procedures, together with aerial and ground patrols, calls from the public to Trans Mountain's toll-free emergency number, and continuous Supervisory Control and Data Acquisition monitoring and leak detection systems combine to form the first line of defense in reducing the consequences of a spill. In addition to this, all Trans Mountain pump stations and terminals have automated leak detection and containment systems that are monitored continuously in the Control Centre. In the event of a facility leak, automatic emergency shutdown protection will immediately isolate the facility and trigger a call out of local personnel to investigate further. Trans Mountain works closely with local police and fire departments, regulatory authorities and Aboriginal communities in developing and maintaining comprehensive plans to ensure preparedness for any type of potential emergency. ERPs are constantly being updated to keep them current. If an incident were to occur, Trans Mountain can act quickly to protect employees and the public as well as mitigate any harm to the environment or property. In the event the potential exists for hydrocarbon vapours to reach unsafe concentrations in the community, the local police force will be advised to initiate evacuation. Teams prepare for these worst-case scenarios on a regular basis using the Trans Mountain ERP and the Incident Command System. The landowner concerns regarding conditions at the pump station, the route and effect on their land will be taken into consideration during detailed design activities. Any changes or effects will be communicated with the landowner and Trans Mountain will work with the landowners to reach jointly equitable solutions.	Volume 7

TABLE 3.3-5 Cont'd

Summary of Interest or Concern	Response Summary	Where Issue is Addressed in the Application
Concern about vandals and children playing in equipment after hours; community safety	Socio-economic studies have been conducted to assess existing conditions and types of land use in the Project area, as well as possible effects. Mitigation strategies and management plans are being developed through discussions with regulatory authorities, Aboriginal communities and stakeholders to help minimize the potential effects of the Project on biophysical and human environments. In areas where there may be a concern regarding the safety of the public, restricted areas are established. Trans Mountain will have a construction site safety and security plan in place and it will be communicated to the Town representatives and adjacent residents. The influx of workers into communities and the potential effects on community way-of-life are discussed under social and cultural well-being in Sections 5.3 and 7.2.3 as well as under community health as it relates to socio-economic health effects, public safety and health care service provision in Sections 5.8 and 7.2.8.	Volume 5B Sections 5.3, 5.8, 7.2.3 and 7.2.8