



This brief is for Volume 8 of Trans Mountain's pipeline expansion project Application to the National Energy Board (NEB). Volume 8 of the application to the National Energy Board (NEB) discusses Project-related marine transportation within a regional study area extending between Westridge Marine Terminal in Burrard Inlet at Burnaby, BC, and a location known as "Buoy J" located at the 12 mile nautical territorial limit at the western entrance to the Juan de Fuca Strait. This study area is comprised of Burrard Inlet and the Salish Sea (the Strait of Georgia, Haro Strait and Juan de Fuca Strait).

The specific purpose of Volume 8 is to address the marine issues identified by the NEB for consideration during the hearing process. Specifically,

...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.

The NEB also released further project-specific guidance on September 10, 2013; *Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities*

Volume 8 includes:

- A description of the Project related increase to marine transportation activities
- A description of public and Aboriginal consultation with marine communities
- An assessment of environmental and socio economic effects of increased Project-related tanker movements
- A marine risk assessment and recommendations to improve tanker safety in the region and mitigate the effects of the Project.

Volume 8 consists of three parts; Volume 8A provides an overall description of the potential environmental and socio-economic effects of increased marine shipping. Volume 8B contains supporting technical reports related to the environmental and socio-economic issues and Volume 8C contains technical reports prepared in support of the TERMPOL review process by Transport Canada related to marine safety including a quantitative risk assessment.

Trans Mountain requested to undertake a TERMPOL process focused on the increase in marine transportation related to the Project. The review process is chaired and led by Transport Canada and has involved other federal departments and stakeholders, as required. The review may consider safety measures above and beyond existing regulations to address site-specific circumstances. The purpose of the TRP is to objectively

Trans Mountain Expansion Project

appraise operational ship safety, route safety management, location, construction and subsequent operation of a marine terminal system for the bulk handling of oil. Such a review enables the inter-departmental committee to identify potential problems and to recommend appropriate ameliorative measures. The results of the review are documented in a report issued by the Termpol Review Committee and made public along with the supporting studies. While the report is not considered to be a regulatory instrument, it is expected to be helpful to Transport Canada and other agencies to help determine the need for regulatory improvements or special measures.

Marine Transportation Activity

While Trans Mountain does not own or operate the vessels calling at the Westridge Marine Terminal, it is responsible for ensuring the safety of the terminal operations. In addition to Trans Mountain's own screening process and terminal procedures, all vessels calling at Westridge must operate according to rules established by the International Maritime Organization, Transport Canada, the Pacific Pilotage Authority, and Port Metro Vancouver (PMV). Although Trans Mountain is not responsible for vessel operations, it is an active member in the maritime community and works with BC maritime agencies to promote best practices and facilitate improvements to ensure the safety and efficiency of tanker traffic in the Salish Sea.

Currently, in a typical month, five vessels are loaded with heavy crude oil at the Westridge Marine Terminal. The expanded system will be capable of serving 34 Aframax class vessels per month, with actual demand influenced by market conditions. Similarly, the future cargo will continue to be crude oil, primarily diluted bitumen.

In addition to tanker traffic, the terminal typically loads two to three barges with oil per month and receives one or two barges of jet fuel per month for shipment on a separate pipeline system that serves Vancouver International Airport (YVR). Barge activity is not expected to change as a result of the expansion.

The safety regime in place today for both tanker traffic and the Westridge Marine Terminal has been developed and continually improved since the terminal entered service in 1953. The regime is based on regulatory requirements, local experience and international best practices. It is comprehensive, well established, and has proven to be safe and effective.

Vessel traffic in the Salish Sea is well managed and important risk controls have been established for all traffic and for oil tankers in particular. Existing risk controls are considered to be state of the art compared to other coastal sailing routes worldwide and in line with global best practices. The risk reducing measures in place today include:

- Inspection of vessels under Port State Control;
- Screening of vessels by charterer and Trans Mountain;
- Aids to Navigation;
- Traffic Separation Protocol;



Trans Mountain Expansion Project

- Oversight by Vessel Traffic Services;
- Mandatory BC Pilotage;
- Mandatory use of modern navigation equipment;
- Mandatory use of escort tugs; and
- Mandatory participation in spill response regime.

Engagement

In consideration of the potential environmental and socio-economic effects to the marine environment from the proposed increase in tanker traffic as a result of the Project, Trans Mountain extended the stakeholder engagement program to include coastal communities, beyond the pipeline terminus at Westridge Marine Terminal (Burnaby, BC). In recognition of this and the high level of stakeholder interest in marine shipments of petroleum products, Trans Mountain has engaged communities on Vancouver Island and the Gulf Islands along established marine shipping corridors transited by oil tanker traffic, as well as communities in and around PMV.

Trans Mountain is actively engaging with 27 Aboriginal communities in proximity to the marine transportation corridor that might have an interest in the Project or have Aboriginal interests potentially affected by the Project. The process for engagement with Trans Mountain about 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.

Results of the engagement have been considered and incorporated throughout the marine transportation assessment where relevant, including the mitigation measures and effects assessment.

Environmental and Socio Economic Assessment (ESA)

The environmental and socio-economic elements considered include marine sediment and water quality, marine air emissions, marine GHG emissions, marine acoustic environment, marine fish and fish habitat, marine mammals, marine birds, marine species at risk, traditional marine resource use, marine commercial, recreational and tourism use, and human health risk assessment. The current state of the biophysical and socio-economic environment in the vicinity of the marine shipping lanes was compared against the Project description to assess potential environmental and socio-economic effects of increased Project-related marine vessel traffic. For this assessment, one or more indicators were selected and used to describe the present and predicted future condition of each element. One or more measurement endpoints (measurable parameters) were identified for each indicator to allow quantitative or qualitative measurement of potential Project effects.

Most of the potential environmental and socio-economic residual effects that could arise from increased Project-related marine vessel traffic are considered to be long-term in duration (i.e., lasting for the operational life of the Project), generally of low to medium magnitude and periodic or accidental in nature. For normal operations there are no situations that would result in a significant adverse environmental or socio-economic effect with the exception of sensory disturbance of southern resident killer whales.

Trans Mountain Expansion Project

The ESA for the marine transportation concludes that past and currently ongoing activities and the designation as a *Species at Risk Act*- listed species indicate there has been a significant adverse effect on the endangered southern resident killer whale population that uses the shipping lanes. Underwater noise modelling completed for the Project demonstrated that additional Project-related marine shipping transits will increase underwater noise and potential sensory disturbance of this population. While the Project's contribution to overall sensory disturbance effects is small, the potential effect of the increase in Project-related marine vessel traffic is considered to be high magnitude, high probability and significant for southern resident killer whales.

With or without the Project, the southern resident killer whale population continues to be adversely affected by sensory disturbance caused by all types of marine vessel traffic. PMV is developing a collaborative multi-stakeholder program to look at the current levels of underwater noise in the Strait of Georgia and surrounding waters and to consider options for reducing potential cumulative environmental effects of noise from marine vessel traffic on marine mammals. Trans Mountain is strongly supportive of this regionally-focused collaborative approach to managing cumulative effects of the marine transportation industry as a whole and will continue discussions with PMV to establish how to best participate in current and future initiatives on this topic aimed at reducing the existing effects on southern resident killer whales.

Marine Risk Assessment

A spill of oil into the marine environment, arising from an incident involving a Project-related tanker, is a key concern for Trans Mountain, Aboriginal communities, government agencies, the public, and the maritime community. Trans Mountain recognizes that an unmitigated oil spill from a tanker could have immediate to long-term effects on the biophysical and human environment of the West Coast of BC.

A quantitative risk assessment was conducted by Det Norske Veritas (DNV) to support the assessment of potential environmental and socio-economic effects of accidents or malfunctions that may occur. The DNV assessment considered regional traffic growth, navigational hazards, vessel construction, and risk controls provided under the existing safety regime. Based on an assessment of the tanker transit route the report identified potential locations for accidents. The report quantified the probability of oil spill incidents and the potential consequence of these incidents in terms of spill volume. These probabilities and consequences were combined to define credible worst case and representative smaller spill volumes forming the basis of fate and behaviour studies.

DNV found the existing risk controls to be state of the art compared to other coastal sailing routes worldwide and are in line with global best practices. However, to mitigate the effect of increased tanker traffic a number of enhancements are recommended which, if implemented, will raise the level of care and safety in the Salish Sea to well above globally accepted shipping standards. The primary recommendations include extending tug escorts for laden tankers throughout Strait of Georgia and Juan de Fuca Strait and implementing a moving exclusion zone around laden tankers.

The DNV assessment calculated a credible worst case oil spill volume of 16,500 m³, which is equivalent to about 15,500 tonnes of heavy crude oil. This volume corresponds to the entire loss of two cargo compartments of a partially laden Aframax vessel. The probability of accidents that could lead to an oil spill was also

Trans Mountain Expansion Project

calculated. With the adoption of additional mitigation measures the frequency of the credible worst case oil spill due to the Project will change from once every 3,093 years to once every 2,366 years.

The DNV assessment also includes a discussion of oil properties in general as well as the results of weathering tests conducted for Trans Mountain on diluted bitumen. To inform the risk assessment, Trans Mountain commissioned a program of testing of diluted bitumen. The testing program included a ten day weathering test for two types of diluted bitumen as well as testing to assess the effectiveness of skimming equipment, dispersants, and in-situ burning. The tests were attended by a wide range of regulators and other agencies. The diluted bitumen showed properties and weathering behaviour similar to other heavy crude oils. During the course of the ten day test the diluted bitumen floated on the water and could be retrieved effectively using conventional skimming equipment.

Results from these tests along with spill volumes and potential locations identified in the risk assessment were used to conduct stochastic modelling for selected locations. Stochastic modelling generates a probability map for oil exposure for the study area. A different map is generated for each combination of spill volume, location, and season. The stochastic modelling was implemented by executing the spill model, for the specific release, every six hours over a full calendar year, to capture the effects of tides, winds, estuarine flow and forcing from the open Pacific. The resulting probability maps do not provide information on a specific spill, but indicate the area that is at risk. An actual spill would only affect a small part of this area, but all parts are at risk. The results of the stochastic modelling are used to discuss the potential environmental and socio-economic effects of credible worst case and smaller oil spills.

Trans Mountain engaged Western Canada Marine Response Corporation (WCMRC) (formerly Burrard Clean Operations) to review the risk assessment and to describe enhancements to the existing spill response planning standards that would better accommodate the tanker traffic resulting from the Project. WCMRC is certified by Transport Canada as a response organization under the Canada Shipping Act, 2001 with a mandate to ensure emergency preparedness and response capacity in the event an oil spill occurs in the marine environment on the West Coast of BC.

The enhanced planning standards for marine spill response described by WCMRC will result in a regime that is able to deliver 20,000 tonnes of capacity within 36 hours from dedicated resources staged within the study area. This represents a response capacity that is double and a delivery time that is half the existing planning standards. These enhancements will reduce times for initiating a response to a maximum of two hours for the harbour and six hours for the remainder of the study area and parts of the West Coast of Vancouver Island. These reduced times will be achieved by creating new base locations along the tanker route. Meeting the response capacities within the designated times requires redundancy of equipment, and as a result the overall capacity of dedicated response equipment available in the area will be in excess of 30,000 tonnes. In addition WCMRC maintains mutual aid agreements in place with several oil spill response organizations in Canada and the United States.

The WCMRC study serves as a practical example of how response capacity could be enhanced to accommodate the Project. Implementation of the plan would be subject to a number of factors and requires knowledge that will be gained through the outcome of the Federal and Provincial reviews of marine spill response, the TERMPOL process, and further consultation with Aboriginal groups and other marine

Trans Mountain Expansion Project



communities. While recognizing that there are alternative means to achieve similar results, Trans Mountain is supportive of the enhanced capacity and the general means of implementation described by WCMRC.

This brief is intended as a general review of content from the December 16, 2013, Trans Mountain Expansion Project submission to the National Energy Board, and not a substitute for the actual content of the submission. Please refer to the submission for a full description of the project.