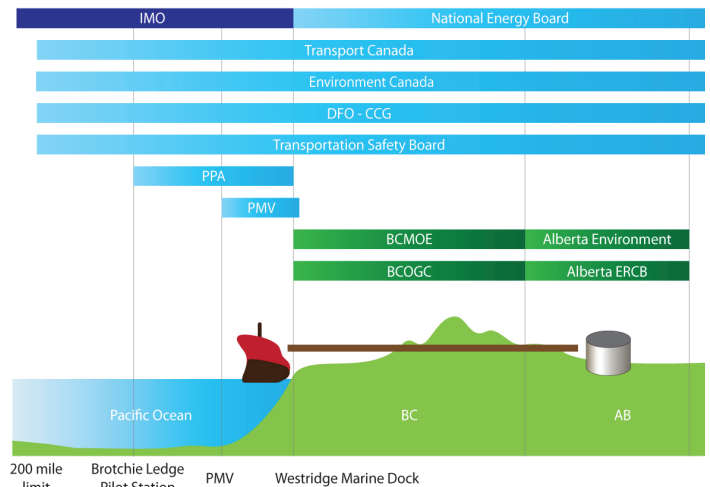


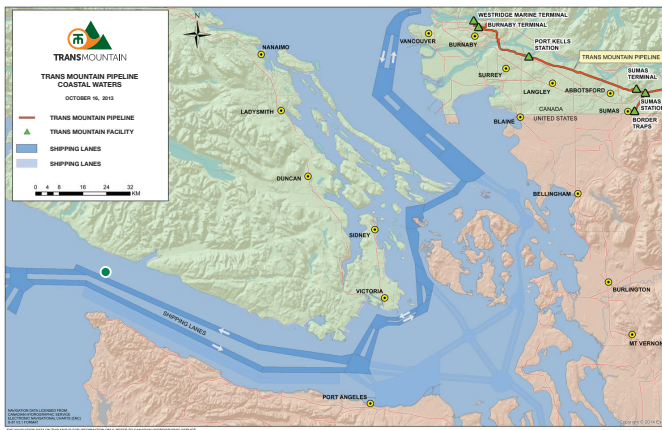
# MARINE SAFETY ENHANCEMENTS

Trans Mountain has safely loaded marine vessels with petroleum products since 1956. The region's already robust marine safety regime is well managed, with important risk controls for all traffic and for oil tankers in particular. Regulations and practices are established, implemented and monitored by Transport Canada, the Canadian Coast Guard, Pacific Pilotage Authority and Vancouver Fraser Port Authority (VFPA). Highly-trained and qualified pilots ensure tankers navigate our local waters safely. Trans Mountain has proposed additional risk controls and enhancements that will build on the current marine safety regime.

## Regulatory Oversight of Crude Oil Transport Operations



## Tanker Traffic



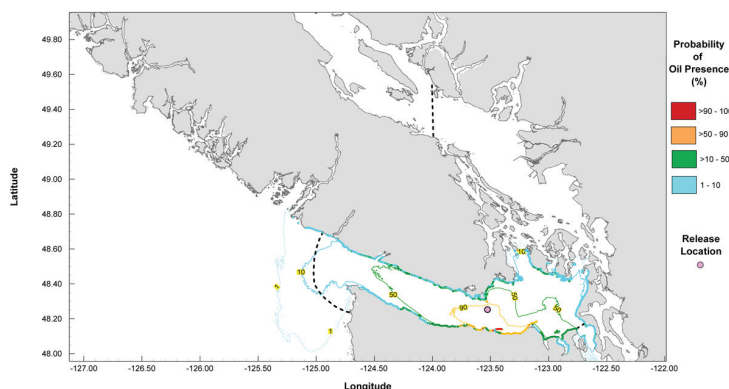
Tanker traffic to Westridge Marine Terminal is expected to grow from approximately five tankers per month to 34. The size of tankers calling at Westridge in future will not change and the largest tankers will remain Aframax-size vessels. These vessels will continue to use the well-established commercial shipping route between Vancouver Harbour and the Pacific Ocean through the Salish Sea.



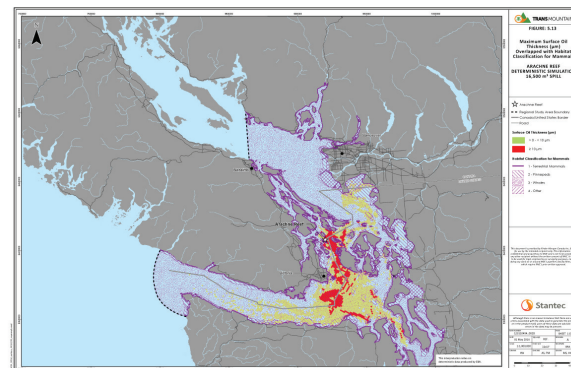
## Risk Assessment

A risk assessment was undertaken to determine the potential impact of the increase in Project-related vessels on navigable waterways. Carried out by international experts in risk, the assessment was based upon:

- Analysis of current and future marine traffic.
- Research and engagement with the local maritime community to identify hazards and review existing safety measures.
- Product fate and behaviour testing to better understand the properties of heavy crude oils like diluted bitumen.
- Spill modelling (2-D and 3-D modelling to understand where oil travels and how it interacts with the marine environment in the event it is spilled).



**Stochastic modelling** 2-D modelling to understand where the oil might go in the event of a spill



**Deterministic modelling** 3-D modelling to understand interactions of the oil after a specific release – fate of the oil in the marine environment

# MARINE SAFETY ENHANCEMENTS

## Proposed Measures to Mitigate Risk

The VFPA regularly undertakes evaluations of overall port traffic to ensure the safety and efficiency of navigation within its jurisdictional waters. Trans Mountain has identified additional precautionary risk control measures that will further mitigate risk due to increased tanker traffic. These measures, some of which are already implemented and do not depend on the Project, include:

- Tug escort of outbound laden tankers will be expanded to cover the entire tanker shipping route through the Strait of Georgia and between Race Rocks and the Juliet Buoy at the western entrance to Juan de Fuca Strait.
- Pilot disembarkation will be extended to take place near Race Rocks instead of Victoria (pilots have been trained to disembark by helicopter).
- Enhanced Situational Awareness techniques will be applied that will require:
  - o Safety calls by pilots and masters of laden tankers.
  - o Notices to industry issued by Pacific Pilotage Authority.
  - o Tactical use of escort tug along shipping route.
- Boating safety engagement and awareness program led by Pacific Pilotage Authority and Transport Canada.

## Oil Spill Response Enhancements

Proposed response enhancements are based on the results of risk assessment, product testing, oil spill modelling and engagement, and would create an increased response area for the Salish Sea and the Strait of Juan de Fuca. Enhancements will be implemented by Western Canada Marine Response Corporation (WCMRC) and will double WCMRC's response capacity while cutting in half the delivery time of existing planning standards. Establishing the enhanced regime entails:



- More than \$150 million investment in WCMRC.
- Creation of more than 100 new jobs.
- Establishing eight new response bases and adding new vessels at strategic locations along BC's southern shipping lane. Two of the bases call for 24/7 operations, including a new Vancouver Harbour base.

For more information, visit [www.wcmrc.com](http://www.wcmrc.com).

The benefits that would result from these proposed marine safety enhancements along with new information about risk and mitigation of oil behaviour would benefit not only Trans Mountain, but all marine waterway users.

## CONTACT US:

Trans Mountain



@TransMtn



[youtube.com/transmtn](https://www.youtube.com/transmtn)



✉ [info@transmountain.com](mailto:info@transmountain.com)

☎ 1.866.514.6700

🌐 [transmountain.com](http://transmountain.com)



Suite 2700, 300 5th Avenue SW  
Calgary, AB, T2P 5J2 CANADA

