Technical Report TR-21

Vancouver Fraser Port Authority Development Permit Application

Consultation Summary – Westridge Marine Terminal

Appendix Q
Trans Mountain Expansion Project

Meeting with FishSafe Advisory Committee

September 17, 2015
Objectives

• Trans Mountain Expansion Project
• Regional Traffic
• Marine Risk Discussion
• Overview of the Marine Transportation ESA
  • Routine Effects
  • Accidents and Malfunctions (non-spill events)
  • Ecological Risk Assessment for Marine Transportation Spills
• Q & A

For details on any of the items discussed here please refer to the Application, including TERMPOL submission material."
Proposed Expansion

- Expand capacity to 890,000 bpd
- Twin remaining 987 km of pipeline
- Increase pumping capability
- Increase storage capacity
- Increase in tanker traffic – not tanker size

Current Operations

- Operating since 1953
- Capacity: 300,000 bpd
- 1150 km between Edmonton and Burnaby
- Ferndale and Anacortes
- Transports refined products, heavy and light crude oils including dilbit
- Last expanded in 2008
Project Timeline

PROPOSED TRANS MOUNTAIN EXPANSION PROJECT AND THE NEB TIMELINE

- Facilities Application Filed with NEB Dec. 16, 2013
- NEB Completeness Determination & Hearing Order
- Intervenor Evidence Information Requests Supplemental Filings
- NEB Oral Argument
- NEB & Federal Government
- Final Engineering, Procurement, Contracting
- Construction
- Expansion in Service @ 890,000 Bbl/d


Decision
TMEP is undergoing a review by the National Energy Board (NEB), including the marine effects of the Project:

- Potential environmental and socio-economic effects of marine shipping activities that would result from the proposed Project, including potential effects of accidents or malfunctions that may occur
- Potential impacts of the Project on Aboriginal interests
- Contingency planning for spills, accidents or malfunctions, during construction and operation of the Project

TMEP requested a TERMPOL review and submitted these studies to the NEB:

- TERMPOL studies submitted to Transport Canada in December 2013
- TERMPOL Review Committee report was submitted to NEB in December 2014
Marine Risk Assessment

Risk is typically seen as a combination of probability and consequence

Key components of the risk assessment process:

- Review of global and regional casualty data
- Review of existing marine network
- Identification of hazards within network (two HazID sessions)
- Consideration of current safety measures
- Forecast for marine traffic (2018, 2028)
- Quantifying of current and future marine incident frequency
- Quantifying of current and future cargo oil spill frequency
- Determination of hypothetical spill volumes – identify credible worst case
- Research into the fate and behaviour of oil cargo (diluted bitumen)
- Undertaking of spill modelling
- Considering consequences of Credible Worst Case oil spill
- Proposing of additional precautionary measures to mitigate risk
Marine Network

TM Current Operations
About 5 tankers/month

TM Future Operations
Up to 34 partially-laden Aframax/month

Same
Route, Products, Vessel Size
Marine Traffic

• 15 – 20% increase in ships between 2012 and 2018 (including TMEP)

• Currently ~ 600 tankers per year
  – 60 Trans Mountain

• Post 2018 ~1000 tankers per year
  – 408 Trans Mountain

• Large vessel transit frequency (Boundary Pass/Haro Strait)
  – Currently averages ~ 96 minutes between vessels
  – In 2018 the average will be ~ 78 minutes between vessels, due to increase in total traffic

Traffic Forecast 2012 – 2018

<table>
<thead>
<tr>
<th>Juan de Fuca</th>
<th>Current</th>
<th>With TMEP</th>
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</thead>
<tbody>
<tr>
<td>All Large Vessels</td>
<td>~5500</td>
<td>~6200</td>
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<tr>
<td>All Tankers</td>
<td>~600</td>
<td>~1000</td>
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<tr>
<td>TM Tankers</td>
<td>60</td>
<td>408</td>
</tr>
<tr>
<td>%age of TM Tankers</td>
<td>1.1%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>
Existing Risk Controls

Vessels must:
• Meet Trans Mountain tanker acceptance criteria
• Be double hulled
• Enroll in Ship Inspection Report (SIRE) Program
• Comply with ALL international and local laws/regulations (International Maritime Organization, Transport Canada, Pacific Pilotage Authority (PPA), Port Metro Vancouver (PMV))
• Have Western Canada Marine Response Corporation (WCMRC) agreement
• Advise Canadian Coast Guard (CCG) prior/upon arrival
• Follow Cooperative Vessel Traffic Service (CVTS), use Traffic Separation Schemes (TSS)
• Take licensed pilot
  – > 7 years experience, Portable Pilot Unit (PPU)
  – 2 pilots for laden tankers
• Take tug escort (PPA/PMV)
• Have Electronic Chart Display and Information System (ECDIS)/Radar
• Follow best practices (International Oil Tanker and Terminal Safety Guide – ISGOTT)
• Be boomed prior to transferring cargo
• Liaise closely with Loading Master
Additional Risk Controls

- Shipping channel in east Burrard Inlet
- Expanded use of tethered and untethered tug escort
- Extension of pilot disembarkation zone
- Enhanced situational awareness:
  - Safety calls by laden tankers
  - Notices to Industry
  - Tactical use of escort tug
  - Engagement and awareness strategy led by PPA
  - Encourage use of Automatic Identification System (AIS) and radar reflector by smaller vessels
- Enhanced oil spill response
TMEP Risk Assessment Results

• In-transit oil spills within the study area (2018, with TMEP)
  
  o Estimated frequency of oil cargo spill (any size):
    – All oil carriers in the region – 1 in 92 years
    – Project tanker – 1 in 284 years

  o TMEP Credible Worst Case scenario – 90th percentile oil spill from side impact (partially-loaded Aframax tanker) determined using Monte Carlo simulation:
    – 16,500 m³ (~15,000 metric tonnes)
    – 1 in 2,841 years
Spill Modelling

Stochastic modelling

- 2-D modelling to understand where the oil might go in the event of a spill – transport of oil in the marine environment

Deterministic modelling

- 3-D modelling to understand interactions of the oil after a specific release – fate of the oil in the marine environment
Enhanced Oil Spill Response

- Based on results of risk assessment, product testing, oil spill modelling, engagement
- Create an “Increased Response Area” for Salish Sea & Juan de Fuca Strait
- Proposes 20,000 mt regional capacity – double the current mandated capacity
- 24/7/365 response capability – new response bases along the route
  - WCMRC is leading discussions on site location
- Reduced minimum response times – Vancouver Harbour (≤ 2 hr) Salish Sea (≤ 6 hr)
- 20,000 mt x max 36 hours delivery on-site
  - Currently 10,000 mt x 72 hours plus travel time
- Enhancements will benefit all users, not just TMEP
TERMPOL Review

TERMPOL Review Committee for TMEP;
- Transport Canada
- Fisheries and Oceans Canada
- Canadian Coast Guard
- Environment Canada
- Canadian Hydrographic Service
- Pacific Pilotage Authority Canada
- British Columbia Coast Pilots
- Port Metro Vancouver

- Recommendations – 17
- Findings – 31
- All have been accepted by Trans Mountain
- All information is publicly available on NEB’s website.
NEB Draft Conditions

NEB recently issued its list of draft conditions for TMEP

Requires TMEP to ensure all marine commitments are operational prior to the Project reaching service in 2018

Includes a number of key marine commitments:

• Marine engagement
• Expanded tug escort
• Enhanced spill response
• Marine mammals program
Workshops, meetings and other engagement opportunities planned for Burrard Inlet and along the Marine Shipping Corridor through 2018 on:

- Westridge Marine Terminal Expansion
  - Construction
  - Operations

- Navigational Safety of Increase in Vessel Traffic
  - Navigation risk controls and mitigation (current and proposed)
  - TM Support for Pacific Pilotage Authority (PPA) outreach program

- Emergency Response Enhancements
  - Westridge Marine Terminal Emergency Response Plan
  - WCMRC capacity and changes to marine spill response regime
Conclusion

- Safety is Trans Mountain’s number one priority
- Trans Mountain is focused on preventing incidents and mitigating the severity of consequences, should any take place
- Navigation risk in the region is well managed and will remain so in future
- Enhanced oil spill response regime for BC South Coast proposes significant improvement in capacity and response time – benefits all users
- NEB Draft Conditions require key marine commitments to be fulfilled

Experience highlights the need for ongoing dialogue regarding marine industry and improvement opportunities
CONTACT US: Trans Mountain Expansion Project

- info@transmountain.com
- 1.866.514.6700
- transmountain.com
- @TransMtn
- youtube.com/transmtn
- soundcloud.com/transmountain

Provide Your Feedback On Construction Planning:

- transmountain.com/construction-survey

2844 Bainbridge Avenue,
PO Box 84028, Bainbridge,
Burnaby, BC, V5A 4T9 CANADA