

Monitoring Report: SV-2021-03-02

## Trans Mountain Expansion Project – Westridge Marine Terminal (WMT) Compliance Verification Activity (CVA) Report

<b>Date</b>	March 3, 2021	<b>Call start time:</b>	1:30 PM	<b>Call end time:</b>	3:00 PM
<b>Format</b>	Web-based conference call with Trans Mountain presenting photographs, documents and/or videos relevant to the expansion of the WMT.				
<b>Fisheries and Oceans Canada (DFO) attendees</b>	W.B. (Senior Biologist), K.J. (Biologist) and I.M. (Biologist)				
<b>Indigenous Advisory Monitoring Committee (IAMC) attendees</b>	<p>Musqueam Nation: J.H. (Environmental Monitor), R.K. (Environmental Stewardship Coordinator) and B.G. (Environmental Monitor)</p> <p>Tsleil-Waututh Nation: A.S. (Referrals Analyst – Environmental Assessments) and J.S. (Environmental Monitor)</p> <p>IAMC – Monitoring Subcommittee: C.T. (IAMC representative – Burrard Inlet and Lower Fraser River, from Tsleil-Waututh Nation) and R.C. (IAMC representative – Alberta First Nations)</p> <p>Note: R.C. joined late due to a conflict with another meeting</p>				
<b>Other attendees</b>	<p>Trans Mountain Corporation (TMC): K.M. (Regulatory Lead), S.D. (Lead Environmental Inspector), B.J. (Chief Environmental Inspector), T.A. (Construction Manager) and L.B. (Field Regulatory Advisor)</p> <p>Kwikwetlem First Nation (KFN): M.J. (Project IM)</p>				
<b>On-site contractor/equipment</b>	<b>Role</b>				
Trans Mountain Corporation	Site Management				
Kiewit Ledcor Trans Mountain Partnership (KLTP)	Prime construction contractor				
JASCO Applied Sciences	Underwater noise monitoring during vibratory and impact pile driving.				
Triton Environmental Consultants (Triton)	Marine mammal monitoring and water quality testing.				
Keller	Deep soil mixing (DSM) and jet grouting works on the foreshore.				
<b>IAMC Indigenous Monitor/IMSC Representative Questions and Comments</b>					
<p>On behalf of RC, prior to RC joining the call, WB asked if there had been any changes in the contractors working at the WMT. TMC confirmed there has been no change in the main contractors and their subcontractors, except for some minor additions of support contractors.</p> <p>CT asked if TMC conducted drilling or pile driving on February 19<sup>th</sup>. TMC responded that they will have to review their schedule to confirm. On March 16<sup>th</sup>, TMC confirmed that approximately 1 hour of impact pile driving occurred on February 19, 2021, at the WMT.</p> <p>AS asked how long the grout spoils on the foreshore take to cure in the pits and if curing time is impacted by rainfall. TMC responded that spoils typically take 24 hours to cure, but may take up to 48 hours during colder rainy periods. TMC said that cement mix is occasionally added to reduce the curing time and that excess water leftover after the grout cures is pumped from the pits to a water treatment plant on the foreshore.</p> <p>JH asked if the spoils barge is within the foreshore turbidity curtain. TMC explained the barge is located outside of the curtain, but other mitigations measures are in place to avoid grout from entering the ocean (e.g., containment below the conveyor, offloading the barge regularly, and ensuring the barge deck is watertight).</p>					



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AS asked if any new erosion and sediment control (ESC) measures have been implemented since the past CVA and if so, has the implementation been precautionary or reactionary. TMC confirmed no new ESC measures have been implemented on the foreshore and existing controls have been effective. Some new ESC measures have been used around the east outfall (e.g. poly-sheeting on exposed ground).

AS noted there is a delay in receiving monthly construction monitoring reports as the January 2021 report from TMC received today discusses ESC measures at the east outfall, but during this CVA photos show that those ESC measures have since been removed. TMC described the new ESC measures that are in use at the outfall and explained the time lag.

AS asked if the daily environmental reports specified in the monthly construction monitoring reports are available daily or following the month end. WB noted that TMC monthly construction reports state that daily reports may be requested from TMC. TMC added that weekly versions of the monthly reports are distributed to the Vancouver Fraser Port Authority and may be distributed to the IAMC upon request. TMC sent the February 22-27<sup>th</sup> weekly report on March 8<sup>th</sup> following the CVA.

WB, following an earlier discussion with CT, asked if TMC is able to provide other options or formats for viewing site construction as virtual CVA's are likely to continue. CT added that video in real-time would be ideal and suggested that a bit of creativity may go a long way. TMC stated that for safety reasons, onsite video may be challenging, but TMC will internally discuss potential options.

RC asked if there is a timeline for when IAMC and DFO monitors will be able to conduct in-person CVA's. WB explained DFO's view, at this time, is based on the Provincial public health restrictions.

AS asked if the spotting scope has been used, if the marine mammal monitoring program is performing to expectations and whether any deficiencies have been identified. TMC confirmed the program is working well. If Triton Environmental, the marine mammal monitoring consultant, does not feel they can visually monitor effectively, they will make that call and inform TMC. TMC could then pause impact pile driving.

RC asked about the procedure and timeline for notification and consultation with Indigenous communities involving an amendment to the offsetting date within the *Fisheries Act* authorization for Westridge. WB explained that it depends on the type of amendment requested and there is no set timeline for consultation. TMC added that the amendment involves changes to the timeline of offsetting implementation and that major changes are not anticipated.

### **Call Overview**

- Introductions
- Review scope of monthly CVAs
  - WB: This call is in place of a typical in-person joint DFO-IAMC Indigenous Monitor CVA site visit given the current situation of the COVID-19 pandemic. This compliance monitoring is to verify conditions of the *Fisheries Act* Authorization for the WMT and also verifying general compliance with the *Fisheries Act*.
- Agenda
  - Overview of recent construction activities
  - Overview of habitat offsetting

### **Works undertaken at Westridge since recommencement of construction activities following the safety shut-down measures**

SD provided an overview of construction activities:



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- **Foreshore** – foreshore extension completed (e.g. cells, arcs and backfilling), continued ground improvement works on the foreshore, grout spoils taken offsite for disposal, and east outfall pipe installation has commenced.
- **Marine** – Mooring dolphins (welding shear lugs to connect jackets to piles), Loading Platform 1/2 (formwork and rebar installed for upcoming concrete pours and equipment installation), trestle supports (large concrete deck pours), vibratory and impact pile driving, and pile clean out to verify till elevation inside piles for geotechnical evaluation.

TMC stated that as of March 1<sup>st</sup>, underwater noise thresholds related to impact pile driving must adhere to a more conservative threshold of 207 dB re: 1µPa and all nearshore works will be completed by end of the extended least risk window (March 15<sup>th</sup>) as per the as *Fisheries Act* Authorization for Westridge.

WB asked TMC when construction activities resumed and for the general schedule following resumption of works at Westridge. TMC responded that works gradually resumed over a two week period starting February 8<sup>th</sup> after all on-site personnel completed new safety training.

SD showed photos of works on the foreshore and provided details regarding mitigation measures associated with them:

- Sheet-pile cell walls adjacent to the ocean are kept tall (above design elevation) while ground improvements works are on-going, acting as a barrier to the water.
  - KJ asked if further tests have been completed to ensure ground improvements works along the sheet-pile cell walls adjacent to the ocean does not result in grout entering the ocean. TMC confirmed that in these areas grout is released at lower pressures so that it permeates slowly through the ground and provided information on testing.
- Grout spoils from ground improvement works cure within pits on the extended foreshore.
  - Excess water leftover from the curing process is treated onsite prior to release.
  - Cured solid spoils are loaded via a conveyor onto a barge for offsite disposal. A tarp fitted beneath the conveyor collects grout spoils so that they do not enter the ocean below. The barge is well sealed (e.g. lock-blocks and caulking) and is cleaned at the end of each day.
- East outfall pipe installation involving construction of a new manhole and outfall pipe at the eastern end of the site within the upper intertidal zone.
  - Turbidity curtain encompasses work area, poly-sheeting is placed over exposed surfaces overnight, and a contractor, Triton Environmental, is conducting a full water quality program.

SD showed photos of works offshore and provided details regarding mitigation measures associated with them:

- Pile clean out of trestle supports (TS) involving sediment and till removal from within the piles for geotechnical assessment
  - Turbidity curtain surrounds piles and swing zone for loading spoils to the barge.
  - WB asked what the water depth is at the trestle supports. TMC confirmed the depth ranges from 6 m at TS1 to 18 m at TS2 and the supports are within the nearshore area.
- Concrete pours on the superstructure
  - End of pumper truck hose is clamped and bagged to ensure no spillage. On the barge there is a large concrete waste tray to contain any spillage. “Plant nappies” are in place under appropriate equipment/vehicles to absorb any hydrocarbons.
- Impact pile driving junction platform and trestle support piles
  - Noise monitoring via hydrophones, pre-dive inspection of bubble curtain, flow monitoring for hoses, fish acoustic deterrents deployed and marine mammal monitoring occurring.



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- WB asked if any fish movement has been observed when using the acoustic deterrents. SD confirmed no fish have been seen lately.

KJ asked if the harbour seal acoustic deterrent is being used during impact pile driving. SD confirmed that it is and explained that 5 marine mammal monitors are required to visually assess the appropriate marine mammal exclusion zone while 4 deterrents are in use. The spotting scope is required when more than 4 deterrents are in use and would be positioned on the crows nest of the DB General barge. KJ asked if TMC has a plan in place if more than 4 deterrents are needed. TMC confirmed they have a monitoring plan for the use of additional deterrents.

Following AS's interest, WB asked if TMC may provide specifications and photos of the spotting scope. SD confirmed they can provide that information. Specifications and a photo were provided by TMC on March 8<sup>th</sup>.

WB asked how long the seal deterrents are being used. TMC stated they have to be engaged for at least 30 minutes prior to pile driving and are used for the duration of the time the pile is impacted.

KJ asked if there is a plan to use the secondary bubble curtain to further attenuate underwater noise during impact pile driving and if JASCO's report is complete. TMC stated they do not intend to deploy the secondary bubble curtain unless elevated noise levels are experienced. The secondary bubble curtain further attenuates underwater noise by 7 dB near the bottom of the pile and 12 dB in the mid-water column. TMC provided JASCO's report for the testing of the secondary bubble curtain on March 9<sup>th</sup>.

KJ asked if any marine mammals other than harbour seals have been observed, to which SD responded no.

### **Habitat Offsetting**

Following on conversation from last CVA and questions about the timing of the installation of the offset, TMC confirmed they will likely be seeking an amendment to extend the December 31, 2021, deadline to complete offsetting.

SD showed photos depicting the rock-reef complex and explained it is meant to offset the habitat that is being lost (rocky intertidal and rocky sub-tidal habitat) due to the foreshore expansion.

- Includes nursery reefs (4), integrated reefs (4), and adult reefs (4) with different depths, rock sizes and orientations appropriate for different life stages of a variety of fish species
- The offsetting is within the Eastern Burrard Inlet Rockfish Conservation Area

TA explained the constraints on constructing the rock-reef complex

- Reefs must be constructed within the least-risk window for Burrard Inlet (August 16 – February 28)
- Cannot be constructed until the expanded foreshore is complete
- Due to delays, TMC will likely seek an amendment to complete construction of the offsetting during the 2022/2023 least risk window



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## GENERAL AND MISCELLANEOUS MITIGATION MEASURES

*Measures specified within the Westridge Marine Terminal Fisheries Act Authorization Conditions:*

<b>Schedule</b>						
2.2.6 All nearshore in-water Project construction activities (within a 50-m horizontal distance seaward of the higher high water large tide level) at the Westridge Marine Terminal shall only be carried out during a work timing window from August 16 to March 15 each year.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
TMC stated that nearshore works (e.g. installation of the east outfall) will be completed prior to March 15 <sup>th</sup> and acknowledged this specific condition.						
<b>Action Items</b>						
None.						
<b>Monitoring</b>						
3.1 A qualified environmental professional must be on-site during the carrying on of in-water works, undertakings and activities, and shall monitor the works, undertakings or activities on a systematic and on-going basis to ensure that standards and avoidance measures to avoid impacts to fish and fish habitat are effective, and that unauthorized impacts to fish and fish habitat are avoided.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
The Lead Environmental Inspector spoke throughout the meeting about their experiences at the WMT during construction since the last compliance verification site visit on January 26 <sup>th</sup> . Qualified environmental professionals are conducting monitoring of construction activities at the WMT and erosion and sediment control measures were monitored and maintained during the period of work stoppage.						
<b>Action Items</b>						
None.						
<b>Marine Mammal Observations</b>						
2.2.7 In-water construction activities must cease if any marine mammal is observed adjacent to or within the project area such that there is risk of direct physical harm to the marine mammal. Construction activities may only resume once the marine mammal has been confirmed to have left the immediate area or has not been sighted for 30 minutes.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
TMC noted that harbour seals were observed within and around the 150 m exclusion zone prior to commencement of impact pile driving. This condition was adhered to.						
<b>Action Items</b>						
None.						
<b>Temporary Structures and Decommissioning of Existing Structures</b>						
The application for a <i>Fisheries Act</i> authorization states that a floating debris boom will be secured around the work area to collect drifting debris during demolition of the existing utility dock (page 3.1).						
Discussed:	<input type="checkbox"/> Yes	Issue(s)	<input type="checkbox"/> Yes	Issue(s)	<input type="checkbox"/> Yes	Not applicable <input checked="" type="checkbox"/>



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<input checked="" type="checkbox"/> No	identified: <input type="checkbox"/> No	unresolved: <input type="checkbox"/> No	
2.2.5 Temporary structures installed below the high-water mark shall be decommissioned and removed when they are no longer being used for construction purposes.			
Discussed/ observed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified: <input type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) unresolved: <input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input checked="" type="checkbox"/>
<b>Comments</b>			
No structures are currently being decommissioned.			
<b>Action Items</b>			
None.			
<b>Pump Intake Screening</b>			
2.2.2 Water intakes of any pumps shall be designed and screened in accordance with specifications outlined in the Addendum, Fisheries and Oceans Canada's <i>Freshwater Intake End-of-Pipe Fish Screen Guidelines</i> (Fisheries and Oceans Canada 1995), and Fisheries and Oceans Canada's <i>Guidelines for Minimizing Entrainment and Impingement of Aquatic Organisms at Marine Intakes in British Columbia</i> (Fisheries and Oceans Canada 1991).			
Discussed/ observed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified: <input type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) unresolved: <input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input checked="" type="checkbox"/>
<b>Comments</b>			
Screens for known water intakes have been discussed during previous site inspections. No issues were reported.			
<b>Action Items</b>			
None.			
<b>Fish Salvage</b>			
2.2.3 Fish salvage and relocation shall be conducted, as appropriate, prior to the start of construction activities so as to avoid and minimize adverse impacts to fish.			
Discussed/ observed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified: <input type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) unresolved: <input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input checked="" type="checkbox"/>
<b>Comments</b>			
No further fish salvage has occurred since the last compliance verification activity call on January 26, 2021.			
<b>Action Items</b>			
None.			
<b>Integrity of Habitat Offsets</b>			
4.7 The Proponent shall not carry on any works, undertakings or activities that will adversely disturb or impact the offsetting measures.			
Discussed/ observed: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved: <input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>			
Offsetting measures have yet to be installed. TMC noted that offsetting construction cannot occur until the foreshore expansion is complete.			
<b>Action Items</b>			
None.			



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### MITIGATION MEASURES SPECIFIC TO PILE DRIVING

*Measures specified within the Westridge Marine Terminal Fisheries Act Authorization Conditions:*

<b>Underwater Sound Pressure Level Reduction</b>						
2.2.8 A vibratory hammer will be used for pile driving where practical and feasible, and all in-water pile driving activities will be monitored via hydrophone to ensure underwater peak pressures do not result in adverse impacts to fish.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.1 To avoid death of fish, mitigation measures (e.g., bubble curtain around the full wetted length of the pile, fish exclusion, etc.) must be implemented.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
Mitigation measures used to deter fish from the area prior to pile driving were described (e.g., noise monitoring via hydrophones, pre-dive inspection of bubble curtain, flow monitoring for hoses, and fish acoustic deterrent deployed).						
<b>Action Items</b>						
None.						
<b>Underwater Sound Pressure Level Monitoring</b>						
2.2.9.2 Monitoring via underwater noise recordings must be conducted continuously and within 10 meters of the pile being driven to verify that underwater sounds do not exceed the 30 kPa (209.5 dB re: 1 µPa) threshold for injury to finfish.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.3. Outside of the least risk window for Burrard Inlet (August 16 – February 28), a more conservative underwater sound threshold of 22.5 kPa (207 dB re: 1 µPa) will be adhered to, and monitored, to prevent injury to finfish. If sound levels exceed this threshold, or a fish kill is observed despite mitigation measures being in place, pile driving activities are to cease immediately and mitigation methods are to be reviewed and modified in consultation with DFO.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.4 If underwater noise recordings indicate that sound levels are likely to exceed the applicable threshold defined in conditions 2.2.9.2 or 2.2.9.3, the Proponent will take appropriate action with the goal of preventing the exceedance from occurring. These actions may include adjusting the force of the hammer, adjusting the mitigation measures already in place to increase their effectiveness, or implementing additional mitigation measures.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.5 Upon commencement of pile driving, or recommencement after a delay of 30 minutes or more, pile installation shall ramp-up by starting with less frequent impact strikes of lower force. This ramp-up period is designed to enable any fish that may be in the area time to leave the area prior to the generation of peak pressure and noise levels for pile installation.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
Impact pile driving recommenced on week of February 8, 2021, following the work stoppage. TMC described mitigations measures employed during impact pile driving. The highest noise level recorded was approximately 202 dB re: 1µPa.						



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<b>Action Items</b>						
None.						
<b>Marine Mammal Monitoring</b>						
2.2.9.6 Prior to commencement of pile driving, or recommencement after a delay of 30 minutes or more, visual monitoring must be conducted to determine if marine mammals are present within an exclusion zone of 1 km (except for harbor seals, which will have an exclusion zone of 150 m).						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.7 Work may only commence if marine mammals and harbour seals are not observed in their respective exclusion zones for 30 minutes.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.8 Exclusion zones must be monitored continuously during impact pile driving. If a marine mammal or marine mammals are observed within their respective exclusion zone, pile driving activities must cease until all marine mammals leave their respective exclusion zone or they have not been sighted for 30 minutes within their respective exclusion zone.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.9 If underwater noise recordings reveal that the threshold of 160 dB is exceeded at the 1 km exclusion zone boundary, the exclusion zone radius must be widened to a new outer limit, where sound recordings demonstrate that the 160 dB threshold is not exceeded. Conditions 2.2.9.6 to 2.2.9.8 will need to be complied with within this new exclusion zone.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.9.10 Pile driving may only be carried out during daylight hours to enable effective visual monitoring of marine mammal exclusion zones.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
Prior and during impact pile driving, and only when needed, TMC is using four seal acoustic deterrents within the 150 m seal-specific exclusion zone as a mitigation measure to avoid adverse impacts (e.g., auditory injury) to 'fish' (which includes marine mammals such as seal) (Condition 2.2.8 of the <i>Fisheries Act</i> Authorization). Since completing the Seal Deterrent Sound Source Characterization Study Report produced by JASCO Applied Sciences, TMC is now monitoring a larger marine mammal exclusion zone (1,700 m radius) prior to and during the deployment of 4 seal acoustic deterrent devices. Only harbour seals have been observed since the previous CVA on January 26, 2021.						
<b>Action Items</b>						
None.						

*Measures specified within the Westridge Marine Terminal Environmental Protection Plan:*

<b>Fish Salvage</b>
35. Immediately following the installation of each sheet pile cell, and prior to excavation and infilling of that cell, conduct a salvage of commercial, recreational and Aboriginal (CRA) fishery species via crab and fish trapping/netting and seines (where appropriate). Release captured CRA fishery species in a suitable habitat at least 500 m away from marine construction activities.





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Discussed/ observed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input checked="" type="checkbox"/>
<b>Comments</b>						
No further fish salvage has occurred since the last compliance verification activity call on January 26, 2021.						
<b>Action Items</b>						
None.						
<b>Turbidity Monitoring</b>						
43. Should visual monitoring during in-water pile installation indicate concern regarding turbidity levels, the Environmental Inspector will arrange for in situ sampling of turbidity (nephelometric turbidity units). Should turbidity levels exceed specified thresholds, pile driving will temporarily be halted.						
Discussed/ observed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
<b>Comments</b>						
No water quality issues were reported during in-water pile installation.						
<b>Action Items</b>						
None.						

**MITIGATION MEASURES SPECIFIC TO FORESHORE CONSTRUCTION**

<b>Riparian Planting and Material Handling</b>						
<i>Westridge Marine Terminal Fisheries Act Authorization Conditions</i>						
2.2.4 Disturbed riparian areas shall be replanted as appropriate, with native non-invasive species of vegetation.						
Discussed/ observed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input checked="" type="checkbox"/>
<i>Westridge Marine Terminal Environmental Protection Plan Commitments</i>						
30. Unless otherwise approved by DFO, retain all excavated [marine] material and dispose at a land-based facility in accordance with applicable regulations.						
Discussed/ observed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input checked="" type="checkbox"/>
<b>Comments</b>						
Not applicable.						
<b>Action Items</b>						
None.						

<b>Water Quality Maintenance and Monitoring</b>						
<i>Westridge Marine Terminal Fisheries Act Authorization Conditions</i>						
2.2.1 Effective sediment and erosion control measures (e.g., a turbidity curtain, etc.) shall be implemented before starting construction and shall be maintained during construction activities, as appropriate, to avoid the deposit and dispersion of sediment into the marine environment.						
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Not applicable <input type="checkbox"/>
2.2.10 A turbidity curtain must be used to isolate the work area during the excavation of riprap in order to contain marine sediment suspended in the water column and limit the extent of sediment dispersion. During severe weather						



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conditions that may reduce the effectiveness of, or impede the visual monitoring of, the turbidity curtain (e.g., > 70 km/h winds, or dense fog), works, undertakings or activities that may increase suspended sediment concentrations within the turbidity curtain or adversely affect the integrity of the turbidity curtain, must be suspended.			
Discussed/ observed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Not applicable <input checked="" type="checkbox"/>			
<b>Westridge Marine Terminal Environmental Protection Plan Commitments</b>			
29. During in-water excavation or rip rap, conduct water quality monitoring (WQM) as per the Water Quality Management Plan during Rip Rap Removal (Appendix H of this EPP). Conduct WQM to assess the effectiveness of the turbidity curtain and modify turbidity curtain deployment, if required.			
Discussed/ observed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Not applicable <input checked="" type="checkbox"/>			
<b>Westridge Marine Terminal Sediment and Erosion Control Plan Commitments</b>			
The in-water sediment curtain will remain intact during Foreshore construction activities to ensure sediment laden water is not discharged into Burrard inlet.			
Discussed/ observed:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Issue(s) identified:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Issue(s) unresolved:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Not applicable <input type="checkbox"/>			
<b>Comments</b>			
A turbidity curtain remains in place around the sheet-pile cells encompassing the foreshore.			
The turbidity curtain also encompasses the foreshore where the east outfall is being installed in the high intertidal zone. There has been slight elevated turbidity within the curtain when there is a tidal change. Water quality tests were completed during times when works were closest to the water – no concerns were identified.			
<b>Action Items</b>			
None.			

<b>Additional comments or action items</b>
<ul style="list-style-type: none"> <li>TMC to brainstorm ideas for other potential virtual viewing opportunities of construction works onsite while virtual CVAs are in place of in-person site visits.</li> </ul>