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Trans Mountain Expansion Project – Westridge Marine Terminal Monitoring

In light of the current COVID-19 pandemic, Fisheries and Oceans Canada (DFO) and Musqueam Indian Band's (Musqueam's) Indigenous Advisory and Monitoring Committee Indigenous Monitor (IAMC IM) are not conducting joint in-person monthly site inspections at the Westridge Marine Terminal (WMT), in Burrard Inlet, BC, in May 2020. Instead, DFO and several representatives from the IAMC (including the Musqueam IAMC IM) are having two conference-call meetings per month with representatives from Trans Mountain Pipeline ULC (Trans Mountain), the Project Indigenous Monitor (Project IM) from Kwikwetlem First Nation (KFN), and Kiewit Ledcor Trans Mountain Partnership (KLTP). This monitoring report provides a summary of the meeting on May 27, 2020. The report includes a description of current in-water and nearshore construction at the WMT, any issues Trans Mountain reported during the meeting regarding measures implemented to avoid or mitigate impacts on fish and fish habitat, and how these issues have been or will be resolved.

Date	May 27, 2020	**Time of Call (Start):**	1:00 pm	**Time of Call End:**	2:30 pm
Format	Web-based conference call with Trans Mountain presenting photographs, documents and/or videos relevant to the expansion of the Westridge Marine Terminal.				
DFO participants	DFO - TMX Review and Engagement Team, Fish and Fish Habitat Protection Program: W.B. (A/ Team Lead), R.L. (A/ Senior Biologist) and E.S.(Biologist).				
IAMC participants	Musqueam Indian Band: Y.A. (Environmental Stewardship Manager), J.H. (IAMC IM), and R.K. (Environmental Stewardship Technician) IAMC – Monitoring Subcommittee: C.T. (IAMC representative – Burrard Inlet and Lower Fraser River, from Tsleil-Waututh Nation), R.C. (IAMC representative – Alberta First Nations), and K.R. (Technical advisor to IAMC)				
Other participants	Trans Mountain: K.M. (Regulatory Lead), T.A (Construction Manager), L.B. (Field Regulatory Advisor), S.D. (Lead Environmental Inspector), and B.J. (Chief Environmental Inspector). B.W. (Senior Indigenous Relations Advisor) J. S. (Environmental Inspector) Kwikwetlem First Nation (KFN): M.J. (Project IM) KLTP: A.A. (Environmental Manager)				

Contractor/equipment on site at the time of the call	**Role**
Nearshore Barge	Moored along the shoreline and working to construct the sheet-pile walls of foreshore cells 1 and 2. Sheet-piles will be driven by a vibratory hammer, and underwater noise levels will be monitored during pile driving. All works in this area are conducted in the dry (e.g., above high tide or when the tide is low). Water quality monitoring for turbidity was conducted in waters outside of the turbidity curtain and no exceedances of the *Canadian Council of Ministers of Environment [CCME] Canadian Water Quality Guidelines for the Protection of Aquatic Life* were recorded.
Offshore barges (e.g., DB General)	TM have begun to weld the dolphin jackets to the piles, and have been pouring grout into the void between the jackets and the piles to seal them in place. Cement is also being poured to cap the trestle span piles. Measures to avoid the release of cement and grout into the marine environment, and measures to contain any spills that may occur are in

	place. A 350 ml spill of grout into the ocean has occurred and has been reported. TM are working to prevent a similar spill from happening again. Larger mooring dolphin piles and smaller trestle piles for the junction platform are being installed via impact pile driving. Both barge-based marine mammal monitoring of the marine mammal exclusion zones and underwater noise monitoring continue to be conducted for offshore impact pile driving. Access platforms have been constructed on the top of breasting and mooring dolphins, and dolphin jackets are being welded into place.

IAMC Indigenous Monitor/IAMC Observations and Comments

The IAMC IM (J.H.) asked whether there was a CO_2 bubbler and hose available in the case of a cement spill. Trans Mountain responded that there was not given the inability to readily contain such a release into marine waters, and instead the focus was on preventing a release of cement or grout into marine waters. CO2 bubbling is typically only used as a treatment for concrete wash water to reduce its pH prior to discharging.

IAMC Representative (R.C. and C.T.) asked which government body is responsible for regulating the integrity of construction and welding, and whether there had been a recent related inspection. Trans Mountain explained that the Canada Energy Regulator (CER) is responsible for overseeing works both on land and above water. An inspection has recently been carried out by CER.

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Time	Summary of inspection discussions
1:00 – 1:05 pm	**Introductions**
1:05 – 1:07 pm	**Review agenda** K.M. gave an overview of the agenda for the meeting and presented the opportunity for participants to add to the agenda.
1:07 – 1:10 pm	**Purpose and scope of the meeting** The purpose of the meeting was summarised by W.B.
1:10–1:35 pm	**Construction Update** S.D. provided an overview of the site layout at WMT and the works that have occurred since the May 14th compliance verification conference call. S.D. showed photographs of construction works and described the mitigation measures. <u>Site Overview</u> • S.D. showed an aerial photo of the WMT construction site, which showed the numbered foreshore cells and arcs. S.D. explained that cells 6-10 have been completed and no works have been carried out on these cells since the previous compliance call. • S.D. stated that all works currently being carried out in the cells are outside of the least risk window (1st March -15th August), and are therefore being completed in the dry, at low tide. • S.D. explained that the sheet-pile templates and sheet-pile walls for cells 5 and 2 would be installed this week. W.B. asked for clarification on which cells are being constructed, as cell 5 appeared in the photo to be below the low tide mark. • S.D. had misspoken, work is currently not being carried out on cell 5. Cells 1 and 2 are currently being constructed. Cell 1 is completely dry during low tide; however, 30% of cell 2 is still submerged during low tide. Works are only being completed on the side of cell 2 which is dry at low tide. S.D. showed a schematic overview of the WMT construction site. S.D. went through the locations and of the construction areas and the construction activities happening in each area, so that participants could orient themselves: • Sheer lugs are being welded to Berthing Dolphins (BD) 7 and 8. • Rebar cages have been installed, sheer lugs have been welded and concrete has been poured at trestle spans 3 and 4. • Eight smaller diameter (1.5m) piles are being driven at the junction platform. • Piles are to be installed at the general mooring trestle and the mooring dolphins to the West. <u>Foreshore – sheet-pile cells and arcs</u> • S.D. showed a photograph of the completed sheet-pile cells 6-10. • T.A. explained that works to increase the stability of the walls are underway.

	• S.D. showed a photo of the Eastern foreshore manifold area, west of cell 10, which has also been completed. W.B. noted some standing water on the surface of the manifold area and asked what was in place to prevent material leaching into the inlet. • S.D. explained that there is a sheet-pile wall in place next to cells 6 - 10. There is also a silt fence, berm and ditch to the East. The silt fence, berm and ditch to the West have been removed, as this area is being expanded, but the berm will be re-implemented once the expansion is completed. • T.A. added that mitigation measures such as the berm and ditch are adjusted as the works evolve. C.T. asked for clarification on the issue being discussed, particularly what type of material could enter the inlet and from where. • S.D. explained that the mitigation measures being discussed are in place to prevent grout from entering the ocean. Grout increases the turbidity and increases the pH of the ocean. S.D. showed a photo of a brace-frame template. • S.D. explained that this template will be used to guide the sheet-piles that will make up the walls of cells 1 and 2, which will be driven by a vibratory hammer. • S.D. reiterated that this work is only being completed in the dry, at low tide. • Poly-sheeting was also visible along the shore in the photo. T.A. explained that this was in place to prevent erosion where riprap has been removed. R.C. asked whether DFO or the Canada Energy Regulator (CER) are responsible for regulating the welding and construction integrity. • K.M. answered that CER is responsible for regulating both on land and over water construction. S.D. showed a photo of the excavated derailment wall trench, explaining that this will be filled with concrete to create a wall.
1:35- 1:50pm	<u>Offshore works</u> <u>Impact pile driving</u> S.D. explained that all works are happening outside of the least risk window and are therefore either carried out in the dry, such as at the foreshore, beyond 50m from the shore, or above water, in compliance with the *Fisheries Act* Authorization (FAA). • S.D. showed a photo of a pile being moved by crane from a horizontal to vertical position, ready for installation at the junction platform. • S.D. showed a photo of piles being driven by a vibratory hammer. S.D. explained that the pile is driven as far as possible with the vibratory hammer and then driven to the depth of refusal with the impact hammer. • S.D. said that underwater noise monitoring had been conducted during both the vibratory and impact pile driving activities, using the same two hydrophone

	system as previously discussed. All noise levels recorded had been below the maximum threshold permitted under the FAA. • S.D. showed a photo of the bubble curtain being lifted by crane from the water, which continues to be used during impact pile driving. • S.D. showed a photo of impact pile driving in progress. The wash from the bubble curtain was visible, as was the noise shroud for atmospheric noise. • S.D. added that marine mammal monitoring has also been carried out during impact pile driving. W.B. asked whether there had been any marine mammals observed during impact pile driving. • S.D. said that there had been a harbour seal sighted within the exclusion zone on 26th May, before pile driving had begun. Pile driving was delayed until the 30 minute re-sighting time window had elapsed. A further two sightings occurred during pile driving. Works were stopped immediately and were not re-commenced until after the 30 minute re-sighting window. S.D. showed a video of impact pile driving with the bubble curtain running, with the wash clearly visible. • W.B. commented on the strength of the wash from the bubble curtain. • S.D. mentioned that TM had studied the turbulence from the bubble curtain. TM found that there is little disturbance resulting from the bubble curtain within the water column, below the surface. S.D. showed a photo of a barge next to a pile being driven. The two acoustic fish deterrents were visible being lifted from the water. • S.D. explained that the acoustic fish deterrents are still being used prior to impact pile driving as per the revised ramp-up sequence. S.D. showed a photo of two technicians carrying out noise monitoring. • The noise levels from both hydrophones were being observed on computers. • S.D. reiterated that noise levels have been below the threshold permitted in the FAA.
1:50 – 2:10 pm	<u>Offshore works – breasting dolphins, trestle span and loading platform</u> S.D. showed a photo of sheer lugs being welded by the crew into the breasting dolphin jackets. • C.T. asked whether the welding activity in the photo shown was what R.C. was referring to in his earlier question regarding the regulator responsible for welding and construction integrity. • K.M said that was correct. K.M. explained that TM have their own quality control process and that CER are responsible for regulating the integrity of the construction. • C.T. asked whether CER had carried out any inspections, or whether there were any plans set for an inspection to be carried out. • K.M. said that CER had recently carried out an inspection, but she wasn't certain of the date.

	S.D. showed a photo of breasting dolphins 7 and 8. • Sheer lugs have been welded to fix the dolphin jackets to the piles. S.D. explained that grout has been poured to fill the space between the dolphin jacket and the pile. S.D. showed a photo of trestle span 3 • S.D. explained that the piles had been filled with concrete and that rebar had been embedded into the pile. • S.D. showed a photo of the rebar being lifted onto the pile. S.D. showed a photo of the loading platform. • Members of the crew were visible working on the concrete structure which is now set. • S.D. explained that decking will be built above the concrete structure. W.B. asked whether S.D. could comment on the mitigation measures in place for the overwater works, which had just been described. S.D. gave an overview of the mitigation measures in place: • Before cement is poured into the piles, the forms are checked to ensure they are water tight, so that no cement can escape into the ocean. • Equipment drip and spill trays are widely used across the site. • Spill kits are situated across site. • Containments for excess concrete are available. • S.D. commented that there will be photos of drip trays and spill kits later in the presentation. S.D. showed a photo of the new turbidity curtain which has replaced the previous yellow foam and plastic turbidity curtain. • S.D. explained that this new curtain has been custom made. It is made of a plastic boom with a heavy duty fabric that has been made to contour with the seafloor, preventing the curtain from touching the seabed at low tide. • Another photo showed the turbidity curtain from a different angle. Turbidity was clearly being contained by the curtain. • A photo was shown of the previous curtain being removed after the new curtain had been installed. S.D. showed several photos of spill trays and Plant Nappies being used on site. • T.A. explained that Plant Nappies are used to ensure hydrocarbons do not enter the ocean, but they allow water to drain. A generator was shown placed on top of a Plant Nappy. • A spill kit was shown, containing various absorbent materials. T.A. explained that spill kits are situated around the site, and the absorbent materials can be used to clean up a cement spill. T.A. explained that there are different spill kits, for different substances and situations. J.H. asked whether there was a CO_2 bubbler and hose available in the case of a cement spill.

	• S.D. replied that there is no CO_2 bubbler on site. If there is a spill on land or on deck it is collected and placed in a containment. S.D. explained that if there was a spill into the water, the fast moving current in the inlet renders the spilled cement unrecoverable. • S.D. stated that any cement spill is reported. • T.A. added that there are many mitigations in place to prevent or lessen the severity of a cement spill, including containments, a secondary containment for equipment being moved, a waste storage facility and poly-sheeting on platforms. • C.T. asked whether there had been a cement spill. • S.D. said there had been a small spill of ~350ml of grout that was caused by an air bubble coming to the surface after the pour had been completed. This spill had been reported and TM are working on a solution to prevent a similar spill happening again.
2:10 – 2:20 pm	S.D. asked whether there were any questions. R.L. asked why the previous turbidity curtain had deteriorated so quickly (within ~ 6 months) and how the new curtain was different from the last. • S.D. explained that the materials used for the previous turbidity curtain were different to the new curtain. The old curtain allowed for more growth, was less durable and harder to repair than the new one. • C.T. asked how the curtain was contoured to the seafloor. • S.D. explained that there was a survey of the seafloor topography carried out by the manufacturer. W.B. mentioned that the hydroacoustic survey of WMT had been shared with DFO and the IAMC. W.B. asked whether there were any updates on the plan to carry out further hydroacoustic surveys. • S.D. explained that the new sonar system purchased by TM had not yet been deployed at WMT. The purpose of the sonar system however, would be to collect data ad hoc, rather than to complete a structured quantitative survey. W.B asked whether there were any plans to test the effectiveness of the hydro-acoustic deterrent using the sonar system. • S.D. explained that this idea had been discussed, but as there have been no further mortality events since the addition of the acoustic deterrent and new ramp-up procedure, TM had decided that this test was not necessary. • T.A. added that works are currently meeting the requirements of the FAA and that TM have already spent a significant amount of time and money on the new mitigation measures now in place, which have been shown to be working. W.B. asked whether the ramp-up procedure had changed since the last compliance call. • S.D. confirmed that the ramp up procedure is the same. W.B. stated that he no further questions. The Webex disconnected unexpectedly and technical issues prevented the call from being reconnected.
2:30 pm	**Call ended**

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GENERAL AND MISCELLANEOUS MITIGATION MEASURES

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

Schedule			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
TM acknowledged that the timing window has closed and that in-water works are only being conducted offshore (i.e., beyond 50 m of the higher high water large tide).			
Action Items			
None			

Monitoring			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
The Lead Environmental Inspector spoke throughout the meeting about their experiences over the last month at the WMT during construction. Qualified environmental professionals are conducting monitoring of construction activities at the WMT.			
Action Items			
None			

Marine Mammal Observations			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
Marine mammal monitoring is being conducted at WMT. Marine mammals have been observed prior to the start of impact pile driving and during pile driving. TM stated that works were stopped immediately when the mammals were sighted and were not restarted until the 30 minute re-sighting window had passed.			
Action Items			
None			

Temporary Structures and Decommissioning of Existing Structures			
The application for a *Fisheries Act* 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: ☐ Yes	Issue(s) ☐ Yes	Issue(s) ☐ Yes	Not applicable ☒

☒ No	identified: ☐ No	unresolved: ☐ 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: ☐ Yes ☒ No	Issue(s) identified: ☐ Yes ☐ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☒
Comments			
The utility dock has been removed and no structures are currently being decommissioned.			
Action Items			
None			
Pump Intake Screening			
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 *Freshwater Intake End-of-Pipe Fish Screen Guidelines* (Fisheries and Oceans Canada 1995), and Fisheries and Oceans Canada's *Guidelines for Minimizing Entrainment and Impingement of Aquatic Organisms at Marine Intakes in British Columbia* (Fisheries and Oceans Canada 1991).			
Discussed: ☐ Yes ☒ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
Screens for known water intakes have been discussed during previous site inspections. No issues were reported.			
Action Items			
None			
Fish Salvage			
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: ☐ Yes ☒ No	Issue(s) identified: ☐ Yes ☐ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☒
Comments			
No fish salvage has taken place at WMT over the past two weeks and there is none planned, because pools along the foreshore have been isolated and infilled.			
Action Items			
None			
Integrity of Habitat Offsets			
4.7 The Proponent shall not carry on any works, undertakings or activities that will adversely disturb or impact the offsetting measures.			
Discussed: ☐ Yes ☒ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☒
Comments			
Offsetting measures have yet to be installed.			
Action Items			
None			

MITIGATION MEASURES SPECIFIC TO PILE DRIVING

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

Underwater Sound Pressure Level Reduction			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
Trans Mountain showed the use of the primary bubble curtain during installation of larger piles by impact hammer. Trans Mountain are testing a secondary bubble curtain to further reduce underwater noise levels during impact pile driving and a new acoustic fish deterrent system is being deployed as an additional mitigation measure to encourage fish to move away from the area and reduce the likelihood of future fish mortality events. TM demonstrated that underwater noise levels are being monitored during both vibratory and impact pile driving activities and that underwater noise thresholds are not being exceeded.			
Action Items			
None.			
Underwater Sound Pressure Level Monitoring			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
TM demonstrated that they are monitoring underwater noise during vibratory and impact pile driving and that levels have remained below the threshold specified in the authorization. TM discussed the suite of mitigation measures being implemented to help reduce effects to marine fish during offshore impact pile driving (e.g., acoustic deterrent system, bubble curtain).			
Action Items			
None			
Marine Mammal Monitoring			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
2.2.9.7 Work may only commence if marine mammals and harbor seals are not observed in their respective exclusion zones for 30 minutes.			
Discussed: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
TM are carrying out marine mammal monitoring. Mammals have been observed within the exclusion zone, and works have been stopped immediately. TM have not commenced work until the 30 minute window has passed, during which no further mammal sightings had occurred.			
Action Items			
None			

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Measures specified within the Westridge Marine Terminal Environmental Protection Plan:

Fish Salvage			
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.			
Discussed: ☐ Yes ☒ No	Issue(s) identified: ☐ Yes ☐ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☒
Comments			
No fish salvage is occurring at WMT.			
Action Items			
None			

Turbidity Monitoring			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
Turbidity curtains are in place and water quality monitoring has recorded no exceedance in water quality guidelines for turbidity outside of the turbidity curtain. TM have installed a new custom made turbidity curtain, which is more durable than the previous curtain, and is contoured to the seafloor.			
Action Items			
None			

MITIGATION MEASURES SPECIFIC TO FORESHORE CONSTRUCTION

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

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Water Quality Maintenance and Monitoring			
Westridge Marine Terminal Fisheries Act Authorization Conditions			
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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
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 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: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Westridge Marine Terminal Environmental Protection Plan Commitments			
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: ☐ Yes ☒ No	Issue(s) identified: ☐ Yes ☐ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☒
Westridge Marine Terminal Sediment and Erosion Control Plan Commitments			
The in-water sediment curtain will remain intact during Foreshore construction activities to ensure sediment laden water is not discharged into Burrard inlet.			
Discussed: ☒ Yes ☐ No	Issue(s) identified: ☐ Yes ☒ No	Issue(s) unresolved: ☐ Yes ☐ No	Not applicable ☐
Comments			
The new turbidity curtain was visible at the works sites, in the photographs shown.			
Action Items			
None			

Additional comments or action items
None.