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Trans Mountain Expansion Project – Westridge Marine Terminal (WMT) Visit

Date	2019-12-13	**Time on site**	0915	**Time off site**	1200
DFO attendees	S.W and W.B.				
IAMC attendees	One Indigenous Advisory and Monitoring Committee (IAMC) Indigenous Monitor (J.H)				

On-site contractor/equipment	**Role**
Trans Mountain	Site Management
KLTP	Prime construction contractor
Hemmera	Water quality monitoring during demolition of the small utility dock.
DB Columbia DB Olympia	Derrick barges (DB) Columbia and Olympia were working in the nearshore on sheet pile cell 8 and 9, but were temporarily shut down at the time of the site inspection due to a mechanical issue.
DB General DB Burrard	DB General working offshore on template for breasting dolphin (BD) piles 7 and 8 and will move to BD piles 5 and 6. DB Burrard conducting preparatory works (welding) for construction of the superstructure.
JJM	JJM (crane) was working from a barge to demolish the small utility dock. The dock was being removed in sections and each section was being placed on a barge for disposal at an approved land-based facility.

IAMC Indigenous Monitor Observations and Comments

DFO input was reviewed. No additional concerns or comments to note.

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Time	Inspection Activity

0915	DFO and the IAMC Indigenous monitor met representatives at the KASK site including:
	• Kiewit-Ledcor Trans Mountain Partnership (KLTP, Environmental Manager [A.A]);
	• Trans Mountain (TM)
	  ○ Chief Environmental Inspector [B.J]
	  ○ TM Environmental Inspector (TM EI [S.D])
	  ○ Regulatory Liaison [B.M]
	  ○ Construction Manager [T.A])
	The TM EI provided an overview of on-going works at the WMT including:
	• Upland activities (road widening);
	• Foreshore activities (outfall re-location, deep soil mixing);
	• Nearshore in-water (sheet pile cells 8 and 9);
	• Offshore (template for breasting dolphin piles 7 and 8; loading platform cells).
	
	Parties discussed the fish kill event that occurred during impact pile driving on December 11 2019. Trans Mountain gave an overview of what they did and observed that day, the mitigation measures in place at the time, discussed next steps, and indicated that offshore impact pile driving activities have ceased for the time being. Trans Mountain indicated that it has been communicating with Vancouver Fraser Port Authority (VFPA) about the event. DFO requested that the information on pile size, hammer, etc. that was requested from TM by the VFPA also be sent to DFO. DFO encouraged Trans Mountain to explore several mitigation options and indicated that it would like to be kept informed of Trans Mountain's investigation as it progresses. Trans Mountain indicated it is exploring many options and is seeking the appropriate expertise to understand the mechanisms that led to the fish kill and identify appropriate mitigation measures to ensure this does not occur during future impact pile driving.

1020	Arrived at the terminal. The Trans Mountain Indigenous Monitor (M.J.) joined the site inspection.
1020-1100	Walk along foreshore: -Observed JJM working from a barge to remove the utility dock and placing sections of the dock onto a materials barge, ready to be sent to an approved disposal facility. The dock is supported by creosote piles. There was a yellow turbidity curtain and a white sorbent boom around the utility dock (Photo 1). The curtain appeared to be functioning to isolate the area and contain saw dust, creosote, and wood debris released during the docks' demolition (Photo 2). The white sorbent boom appeared to be functioning to absorb creosote floating on the water's surface. The TM EI confirmed that creosote that is not absorbed by the sorbent boom is skimmed off the surface of the water at the end of each day and sorbent booms are regularly replaced. The IAMC Indigenous Monitor suggested that an additional sorbent boom be placed along the shoreline, within the demolition work area, to prevent creosote from becoming lodged between the rocks and shoreline

	substrate. The TM EI confirmed that an additional boom would be installed. -Observed preparatory works to re-locate two outfalls (installation of shoring boxes prior to installation of a manhole). -Observed white polysheeting covering areas where riprap was removed along the west side of the shoreline. The polysheeting was being weighed down by sandbags and appeared to functioning as intended to limit sediment erosion into the marine environment. -The TM EI confirmed that riprap excavated during DFO's last site inspection was disposed of at an approved disposal site in the Lower Mainland. -Observed a yellow excavator conducting preparatory works along the shoreline associated with installation of a temporary flexi-float dock and gangway. The temporary flexi-float dock will replace the utility dock (which is currently being demolished) and be removed after the marine construction office is constructed. There was a yellow turbidity curtain around the work area (Photo 3). -Observed yellow turbidity curtain around active works associated with sheet pile cells 8 and 9. The turbidity curtain appeared to be functioning to contain sediment-laden water. -Observed Hemmera conducting water quality monitoring during demolition of the utility dock.
1100-1130	Boat trip: -Observed bubble curtains in action (Photo 4). The TM EI indicated that a dive crew was on site and using drop cameras to capture footage of the curtains underwater. This was being done as part of TM's preliminary investigation associated with the recent fish kill events.
1130-1200	Walk along foreshore: -Observed installation of three layers of sediment and erosion control measures (lock blocks, a berm, and a sediment fence) along the foreshore to capture potential run-off during deep soil mixing activities. The TM EI indicated that the sediment fence near the deep soil mixing test hole will be re-installed by TM as it was not keyed in properly. The lock blocks and berm appeared to be functioning as intended.

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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.
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
Comments
Nearshore works were taking place within the work timing window.
Action Items
N/A
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.
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
Comments
Trans Mountain EI and the Trans Mountain Indigenous Monitor (TM IM) were on site at the time of the inspection. DFO communicated with the TM IM to understand if he had any concerns or observations to report. The TM IM advised DFO that they were on site when the December 11 2019 fish kill event happened and that their community is seeking to engage with Trans Mountain to help identify additional mitigation measures during impact pile driving.
Action Items
N/A
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.
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
Comments
No marine mammals were observed at the time of the site visit during in-water works.
Action Items
N/A
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).
☒ Compliant ☐ Non-compliant ☐ Not observed/unknown ☐ Not applicable
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments

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A yellow turbidity curtain and a white sorbent boom were placed around the utility dock and appeared to be effective at isolating the area and collecting saw dust, wood debris, and creosote released during the utility dock's demolition.
Action Items
N/A
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).
☐ Compliant ☐ Non-compliant ☒ Not observed/unknown ☐ Not applicable
Comments
DFO did not observe any pumps in operation during the site inspection.
Action Items
N/A
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
No fish salvage activities were occurring at the time of the site inspection.
Action Items
N/A
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
The offsetting measures had yet to be installed at the time of the inspection.
Action Items
N/A

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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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
No vibratory or impact pile driving was occurring at the time of the site inspection.
Action Items
N/A
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
Conditions are specific to impact pile driving; impact pile driving was not occurring at the time of the site visit.
Action Items
N/A
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).
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ 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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
Conditions are specific to impact pile driving; impact pile driving was not occurring at the time of the site visit.
Action Items
N/A

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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
No fish salvage activities were occurring at the time of the site inspection.
Action Items
N/A
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.
☐ Compliant ☐ Non-compliant ☐ Not observed/unknown ☒ Not applicable
Comments
No in-water pile installation activities were occurring at the time of the site visit.
Action Items
N/A

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.			
☐ Compliant	☐ Non-compliant	☐ Not observed/unknown	☒ 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.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
Comments			
Sections of the existing utility dock were being removed and placed on a materials barge during the site inspection; DFO did not directly observe the material being shipped or transported to land for disposal at a land-based facility.			
Action Items			
N/A			

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.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ 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.			
☐ Compliant	☐ Non-compliant	☐ Not observed/unknown	☒ Not applicable
Westridge Marine Terminal Environmental Protection Plan Commitments			
29. During in-water excavation of 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.			
☐ Compliant	☐ Non-compliant	☐ Not observed/unknown	☒ 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.			
☒ Compliant	☐ Non-compliant	☐ Not observed/unknown	☐ Not applicable
Comments			
The turbidity curtain remains in place around the sheet pile cells and attaches to the foreshore. A turbidity curtain, and sorbent boom were in place around the utility dock during its demolition. Another turbidity curtain was in place around the works associated with the temporary flexi-float dock.			
Action Items			

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N/A

Additional comments or action items
Update on follow-up action items from November 25 site inspection: None Action items: • Trans Mountain to send DFO the information on pile size, hammer, etc. that was requested from TM by the VFPA. • Trans Mountain to install an additional spill boom along the shoreline near the dock demolition work as requested by the IAMC Indigenous Monitor. • Trans Mountain to re-install the sediment fence near the deep soil mixing test hole to help prevent runoff from entering the marine environment.

Photo 1. Yellow turbidity curtain and white sorbent boom installed around utility dock during dock demolition activities conducted by JJM.

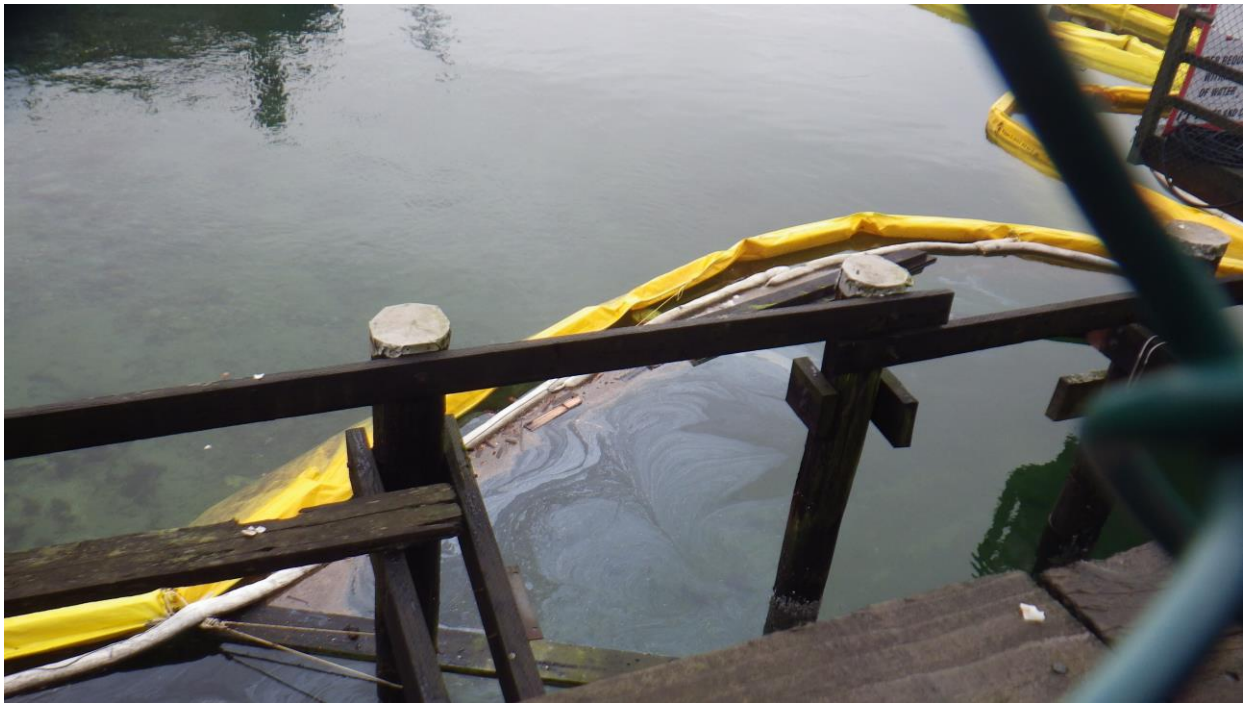

Photo 2. Yellow turbidity curtain and sorbent boom containing saw dust, wood debris, and creosote released during demolition of the utility dock. Any remaining debris is skimmed off the surface of the water at the end of each day.

Photo 3. Yellow turbidity curtain around works associated with installation of temporary flexi-float dock.

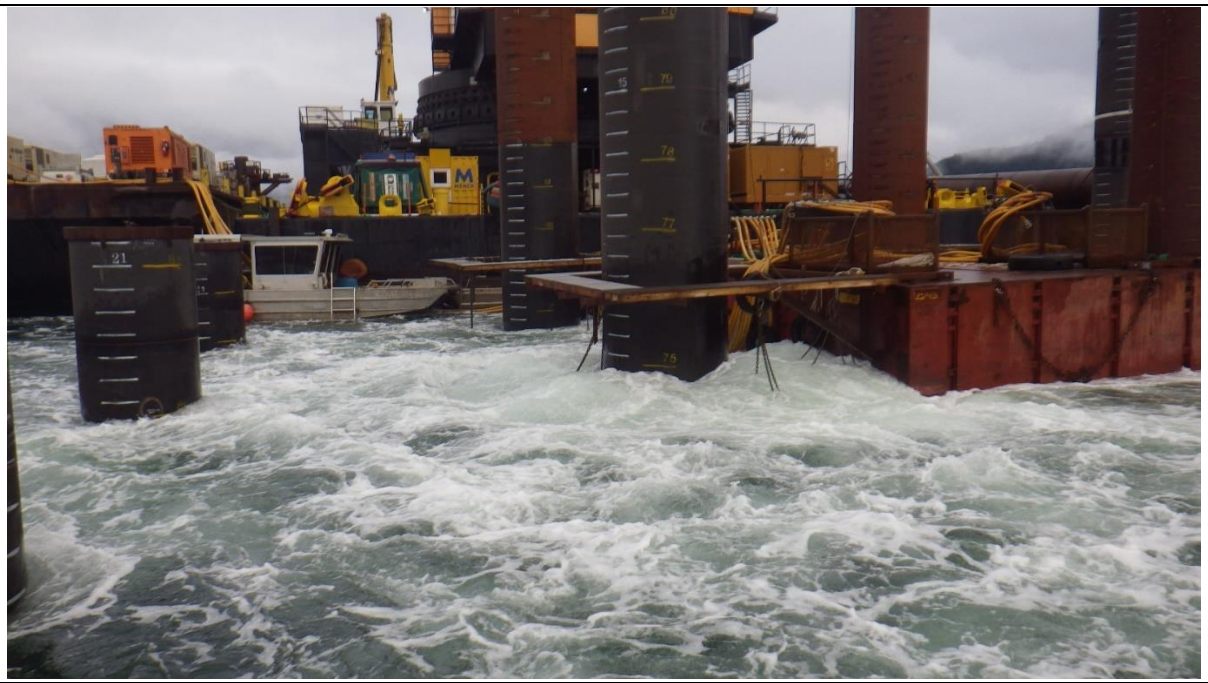

Photo 4. Activated bubble curtains, which are used to dampen underwater noise levels during impact pile driving, being tested in the absence of impact hammer pile driving.