Hearing Order OH-001-2014
Trans Mountain Pipeline ULC
Trans Mountain Expansion Project
NEB File OF-Fac-Oil-T260-2013-03 02
Filed February 26, 2015

Notice of Motion

Decision or Order Requested

The Intervenor, Andrew Weaver, requests an order from the Board that:

1. Trans Mountain be compelled to provide full and adequate responses to those portions of Weaver A. Information Request No. 2, as identified below in Table 1, by such date as the Board in its absolute discretion, deems appropriate.

Statement of Facts

1. Trans Mountain has failed to provide full and adequate responses to a number of questions prepared by the Intervenor Andrew Weaver.

2. In several instances Trans Mountain has made significant error in determining that the requested information is not relevant to the List of Issues or is outside the scope of the review. Trans Mountain has failed to provide compelling explanations for these determinations.

3. The Intervenor, Andrew Weaver, has prepared in table format, as directed by the Board's Procedural Direction #9, a list of the partial or inadequate responses with explanations as to why the answers are inadequate or erroneous as the case may be, and where they should be corrected and fully addressed.

4. The Intervenor, Andrew Weaver, is concerned that Trans Mountain has failed in its obligation to provide full and adequate responses.

5. The Board is respectfully requested to order Trans Mountain to answer all questions as presented.

All of which is respectfully submitted on February 26, 2015

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Hearing Order OH-001-2014
Trans Mountain Pipeline ULC (Trans Mountain)
Application for the Trans Mountain Expansion Project
Procedural Direction No. 9 – Process for hearing motions to compel full and adequate responses to the second round of intervenor information requests (IRs)

Organizational chart for comments on inadequacy of IR responses

NOTE: To add additional rows to the table, place your cursor in the last cell/box (i.e., at the bottom right) of the table, and press the "Tab" button on your keyboard.

IR #	IR Wording [1]	Trans Mountain's response to IR [2]	Intervenor's explanation for claiming IR response to be inadequate [3]	Trans Mountain's response to motion [4]	Intervenor's reply [5]
2.03 c)	Please provide your best estimate (in percentages) of where the financial costs would come from to clean up a credible worst case oil spill (16,500 m3) and a smaller spill (8250 m3) at Arachne Reef, including sources such as Trans Mountain and Federal, Provincial or municipal governments. The total of all percentages given should equal 100%.	As noted in response to Weaver A IR No. 2.03a, Trans Mountain is not liable for a marine spill as described, and has not estimated any costs. Responsibility for such an event lies with the tanker owner. The recovery of costs of such a spill is subject to the Marine Liability Act; the compensation regime is described in Volume 8A, Section 1.4.1.6 (Filing ID A3S4X3) of the Application. The regime features three tiers of financial coverage of spill costs including the tanker owner's insurance under the 1992 Civil Liability Convention (CLC), the International Oil Pollution Compensation Fund (IOPCF) and Canada's Ship-source Pollution Fund (SOPF). As Canada has ratified all conventions associated with the IOPCF, it has access to both the 1992 IOPC Fund and the 2003 Supplementary Fund. Claims by governments (national, provincial, local) are eligible for financing through these sources. To date, no single spill has generated eligible claims that have exceeded the resources available through these sources. The best estimate of where the financial costs would come from to clean up the costs of *any* tanker spill is thus 0% for the entities listed in the Information Request (Trans Mountain and Federal, Provincial or municipal governments); the financial costs would come entirely (100%) from the "insurance" mechanisms (tanker insurance	Trans Mountain states that "claims by governments are eligible for financing through these sources. To date, no single spill has generated eligible claims that have exceeded resources available through these sources." In the 1989 Exxon Valdez oil spill, Exxon spent an estimated $2 billion cleaning up the spill and a further estimated $1 billion to settle related civil and criminal charges. Resulting in an estimated $3 billion cost for clean-up and legal claims. Currently, maximum compensation for a persistent oil spill from tankers in Canada is $1.54 billion (source: Western Canada Marine Response Corporation). Is this $1.54 billion compensation fund intended to cover the costs of clean-up as well as legal claims made by government? Should the claims exceed the resources available through the IOPCF and the SOPF, is government responsible for the additional costs?		

[1] In this column, insert the relevant text of the IR that was asked. If the entire question is relevant to your submission, insert the full text. The references and preambles can be omitted (removed), unless they are essential to your submission.
[2] In this column, insert the relevant text of Trans Mountain's response to the IR. If the entire response is relevant to your submission, insert the full text.
[3] In this column, explain why you consider the IR response to be inadequate.
[4] In this column, include Trans Mountain's response to your motion.
[5] In this column, you may only reply if Trans Mountain has filed a response to your motion, and your reply may only deal with matters raised by Trans Mountain in its response.

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		under the 1992 CLC, 1992 IOPC Fund, 2003 [IOPC] Supplementary Fund, Canada SOPF). It is not possible to provide a further disaggregation among the insurance mechanisms as it would depend on the total costs of the spill, the tonnage of the vessel, and determinations made among the insurers and Funds.			
2.04 a)	Recognizing Trans Mountain's view that "A total loss scenario is not a viable scenario as it is not considered credible [and that] Volume 8A of the Facilities Application focused on credible worst-case and smaller spills consistent with [reference viii]" (source), but given the fact that there are multiple historical cases of marine oil spills larger than 15% of a tanker's cargo (the credible worst- case scenario for Trans Mountain's current application), why has such a spill scenario not been incorporated into the risk analyses of an oil spill?	The credible worst case scenario used in spill modelling is described in Section 9.1.5, Technical Report TR 8C 12 Supplemental TR S9, Volume 8C, Modelling the Fate and Behaviour of Marine Oil Spills for TMEP (Filing ID A3S5G9). The CWC collision scenario represents a breach in two tanks at the waterline and subsequently total loss of the two tanks content, which is also to be considered as a "credible worst case". The NAPA model is a global leading naval architect model, which applies the impact severity (indentation depth, length and height) from the IMO SOLAS statistics that are used for stability estimation of vessels. The model and statistics applied are well known and state of the art. This is further supported by comparing with the historical oil spill data from ITOPF, when differentiating between accidents with single hull, double bottom and double hull vessels. Thus there should be no doubt that the spill scenarios represent credible worst case scenarios. Trans Mountain is confident that the evaluation of potential environmental effects applying this methodology fulfills NEB requirements (Filing ID A3V6I2) and describes the range of environmental effects that could result from an oil spill along the marine shipping route. Evaluation and assessment conclusions of potential environmental effects have identified the need for additional preparedness and response planning measures, which have been proposed as part of the enhanced oil spill response regime (Volume 8A, Table 5.5.3 [Filing ID A3S5Q3). Please note that the spill response packages proposed have been	First, given that 10% of the time spills are larger than the "credible worst case scenario" used in Trans Mountain's spill modelling, those scenarios do not represent the full scope of possible scenarios that have up to a 10% probability of occurring (according to the analysis provided in Trans Mountain's application). Second, the question asks why such a spill was not incorporated into the risk analysis. The response provided by Trans Mountain discusses response capacity and does not address the risk analysis. Finally, the question was asking why a total loss of cargo spill scenario has not been incorporated into the risk analyses of an oil spill – not just a spill slightly larger than 15% of the tankers cargo. Recognizing that 20,000Mt is larger than 15% of a tankers cargo, but only marginally so, can Trans Mountain respond to the request asking why a total loss scenario is not considered?		

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		conservatively calculated based upon building a response capacity of 20,000 metric tonnes (Mt) capable of responding anywhere along the shipping route. 20,000Mt is larger than 15% capacity of a partly laden Aframax tanker.			
2.05.1.c	Reference: iv) A3Y3W4, Trans Mountain Responses to Weaver A IR No. 1. Request: c) Please confirm that when the data on "serious incidents" involving oil tankers that is provided in response to Weaver A IR No. 1.10.1.e in reference iv) (page 77 of 148) is plotted on a graph with an accompanying trend line, the slope of the trend line is approximately 0.2806. If not, why not? c.1) If yes, please confirm that this trend line demonstrates that over the period 2002-2009, the number of serious incidents involving oil tankers has increased annually by approximately 28.06%. If not, why not?	Records show that the number of serious incidents involving oil tankers has varied over the years as pointed out by the intervenor and shown in data filed with the Application (Termpol 3.8 [Filing ID A3S4T1 and update to Termpol 3.8 [Aug 2014, Filing ID A4A7R1]). The request is not relevant to the analysis. Det Norske Veritas (DNV) has not applied regression analysis or trend lines in the analysis, or as basis for any conclusions.	In TERMPOL 3.8 – Casualty Data Survey, Det Norske Veritas (DNV) concludes that: "The casualty data survey shows that there has been a decline in the number of incidents both internationally and in Canadian waters for 2002 - 2011." (A3S4T1, Document p. 32) The data provided in response to Weaver A IR No. 1.10.1.e in reference iv) (page 77 of 148) of this Information Request is taken directly from TERMPOL 3.8 – Casualty Data Survey. When a trendline is applied to the number of "serious" incidents involving oil tankers, it appears the slope is 0.2806, suggesting that such incidents have increased by a rate of 28.06%. If this is in fact the case, then DNV's conclusion that there has been a decline in the number of incidents involving oil tankers is not supported by data on "serious" incidents. Subsequent information requests make similar inquiries into trends for "total loss" and "not serious" incidents, which together account for the three categories of data provided by DNV on oil tanker incidents in reference iv). It appears from this data that the decline in the number of tanker incidents is accounted for by "not serious" incidents and that there has in fact been an increasing trend in the number of incidents for "serious" and "total loss" incidents. Understanding these trends is essential to evaluating the safety of oil tanker transportation. The request is therefore directly relevant to DNV's conclusions from their analysis and hence the analysis itself. Trans Mountain has not confirmed nor denied IR 2.05.1.c and IR 2.05.1.c.1 and		

IR #	IR Wording [1]	Trans Mountain's response to IR [2]	Intervenor's explanation for claiming IR response to be inadequate [3]	Trans Mountain's response to motion [4]	Intervenor's reply [5]
			hence the response given is incomplete.		
2.05.1.d	Reference: iv) A3Y3W4, Trans Mountain Responses to Weaver A IR No. 1. Request: d) Please confirm that when the data on "total loss incidents" involving oil tankers that is provided in response to Weaver A IR No. 1.10.1.e in reference iv) (page 77 of 148) is plotted on a graph with an accompanying trend line, the slope of the trend line is approximately 0.0097. If not, why not? d.1) If yes, please confirm that this trend line demonstrates that over the period 2002-2009, the number of total loss incidents involving oil tankers has increased annually by approximately 0.97%. If not, why not?	The number of recorded total loss incidents in the IHS Database varies each year as pointed out by the intervenor. As advised the intervenor in response to Weaver A IR No. 1.10.3d (Filing ID A3Y3W4) the IHS database (upon which information this graph is based) records both actual total loss (loss of the vessel) and constructive total loss (written off by insurer after an accident) as "total loss." Also, a total loss is not synonymous to an oil spill accident. The request is not relevant to the analysis. Det Norske Veritas (DNV) has not applied regression analysis or trend lines in the analysis, or as basis for any conclusions.	In TERMPOL 3.8 – Casualty Data Survey, Det Norske Veritas (DNV) concludes that: "The casualty data survey shows that there has been a decline in the number of incidents both internationally and in Canadian waters for 2002 - 2011." (A3S4T1, Document p. 32) The data provided in response to Weaver A IR No. 1.10.1.e in reference iv) (page 77 of 148) of this Information Request is taken directly from TERMPOL 3.8 – Casualty Data Survey. When a trendline is applied to the number of "total loss" incidents involving oil tankers, it appears the slope is 0.0097, suggesting that such incidents have increased by a rate of 0.97%. If this is in fact the case, then DNV's conclusion that there has been a decline in the number of incidents involving oil tankers is not supported by data on "total loss" incidents. Subsequent information requests make similar inquires into trends for "serious" and "not serious" incidents, which, together, account for the three categories of data provided by DNV on oil tanker incidents in reference iv). It appears from this data that the decline in the number of tanker incidents is accounted for by "not serious" incidents and that there has in fact been an increasing trend in the number of incidents for "serious" and "total loss" incidents. Understanding these trends is essential to evaluating the safety of oil tanker transportation. The request is therefore directly relevant to DNV's conclusions from their analysis and hence the analysis itself. Trans Mountain has not confirmed nor denied IR 2.05.1.d and IR 2.05.1.d.1 and hence the response given is incomplete.		
2.05.1.e	Reference: iv) A3Y3W4, Trans Mountain	Refer to Weaver A IR No 2.5.1c-i. Records show that the number of not serious	In TERMPOL 3.8 – Casualty Data Survey, Det		

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	Responses to Weaver A IR No. 1. Request: e) Please confirm that when the data on "not serious incidents" involving oil tankers that is provided in response to Weaver A IR No. 1.10.1.e in reference iv) (page 77 of 148) is plotted on a graph with an accompanying trend line, the slope of the trend line is approximately -0.5861. If not, why not? e.1) If yes, please confirm that this trend line demonstrates that over the period 2002-2009, the number of not serious incidents involving oil tankers has decreased annually by approximately 58.61%. If not, why not?	incidents in the IHS Database involving oil tankers has varied over the years as pointed out by the intervenor and shown in data filed with the Application (Termpol 3.8 [Filing ID A3S4T1 and update to Termpol 3.8 [Aug 2014, Filing ID A4A7R1]). The request is not relevant to the analysis. Det Norske Veritas (DNV) has not applied regression analysis or trend lines in the analysis, or as basis for any conclusions.	Norske Veritas (DNV) concludes that: "The casualty data survey shows that there has been a decline in the number of incidents both internationally and in Canadian waters for 2002 - 2011." (A3S4T1, Document p. 32) The data provided in response to Weaver A IR No. 1.10.1.e in reference iv) (page 77 of 148) of this Information Request is taken directly from TERMPOL 3.8 – Casualty Data Survey. When a trendline is applied to the number of "not serious" incidents involving oil tankers, it appears the slope is -0.5861, suggesting that such incidents have decreased by a rate of 58.61%. Subsequent information requests make similar inquiries into trends for "total loss" and "not serious" incidents, which together account for the three categories of data provided by DNV on oil tanker incidents in reference iv). It appears from this data that the decline in the number of tanker incidents is only accounted for by "not serious" incidents and that there has in fact been an increasing trend in the number of incidents for "serious" and "total loss" incidents. Understanding these trends is essential to evaluating the safety of oil tanker transportation. The request is therefore directly relevant to DNV's conclusions from their analysis and hence the analysis itself. Trans Mountain has not confirmed nor denied IR 2.05.1.c and IR 2.05.1.c.1 and hence the response given is incomplete.		
2.05.1.f	Reference: ii) A3S4T1, TERMPOL 3.8, Casualty Data Survey, PDF pages 5-18. iv) A3Y3W4, Trans Mountain Responses to Weaver A IR No. 1. Request: f) Weaver A IR No. 1.10.1.f in reference iv) (page 77 of 148), asked "how many	The assessment currently underway is focused on the marine study area. Viable and credible information has already been provided to the intervenor, which is referred to in this information request. The information request is therefore not relevant to one or more of the issues identified in the National Energy Board's List of Issues for the Trans Mountain Expansion Project (Filing ID A3V6I2).	The information request is directly relevant to issue five: "The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed Project, including the potential effects of accidents or malfunctions that may occur." (emphasis added) Annual incident rates per shipyear have been used as an indicator of the risk of potential accidents from oil tanker traffic		

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	shipyears would be equivalent to one year of operations of the fully-completed Kinder Morgan Expansion Project with the expected 408 tankers departing Westridge Marine Terminal annually." Trans Mountain replied stating: "Based on an average of 5 days' time spent within the marine study area, 408 tanker calls equates to approximately 5.6 shipyears annually." Page 12 of reference ii) states that "exposure data for global oil tankers includes all the sailing of the tankers, also in high seas while the likelihood for an incident at high seas is much lower than in coastal waters." Please provide the total number of shipyears, as requested in Weaver A IR No. 1.10.1.f but based on the entire tanker sailing route, not simply the amount of time spent in the marine study area.		associated with the project. In response to Weaver A IR No. 1.10.1.f in reference iv) (page 77 of 148), Trans Mountain narrowly calculates shipyears as if tankers only travel in the marine study area. However, as noted in reference ii) any ship that services Westridge Marine Terminal will travel beyond the marine study area, which accounts for the majority of a ship's travel over the course of a year therefore also needs to be factored into the calculation of the number shipyears represented by the project. In fact, the Trans Mountain Expansion Project represents significantly more shipyears annually than 5.6. This is important because in its application, Trans Mountain provides an incident rate based on shipyears. When Trans Mountain narrowly defines shipyears as only representing travel in the marine study area, it skews the oil tanker incident rates represented by its project to appear smaller than they actually are. Finally, the incident rates per shipyear cannot be extrapolated based on the data already provided because as noted in reference ii) the likelihood of an incident at high seas is much lower than in coastal waters. One therefore cannot conclude that the incident rate calculated for 5.6 shipyears in coastal waters would be the same as the actual incident rate when shipyears include the high seas. I therefore submit that Trans Mountain has not adequately responded to the information request.		
2.05.2.a	Reference: v) A3Y3W4, Trans Mountain Responses to Weaver A IR No. 1. Request: a) In reference v), Trans Mountain's response to Weaver A IR No. 1.10.5.e offers the rationale behind applying a 100 times risk reduction factor to mechanical failure	A response was provided in Weaver A IR No. 1.10.5.e (Filing ID A3Y3W4) that explained the rationale of the applied risk reduction factor related to use of tugs. At nowhere along the tanker sailing route (outside of Vancouver port) is a tug required to assist in the normal movement of the vessel. As such, the risk reduction factor is adequate and can be considered valid for the project tanker's	Trans Mountain's response provides an assertion without offering supporting evidence. The information request asked for the evidence behind the choice to apply a risk reduction factor of 100. Trans Mountain has simply asserted this reduction factor to be accurate without providing the requested evidence to back up their claim. I therefore submit that the response is inadequate.		

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	rate of a tethered tug. Neither Trans Mountain's response to Weaver A IR No. 1.10.5.e nor its response to Weaver A IR No. 1.10.5.e.1 confirms if this risk reduction factor has been validated for the Trans Mountain tanker sailing route. Please confirm if this risk reduction factor has been validated for the Trans mountain tanker sailing route. If yes, please provide this validation. If no, please explain why not.	sailing route.			
2.05.2.b	Reference: ii) A3S5F6, TERMPOL 3.15, General Risk Analysis and Intended Methods of Reducing Risks, Full Report. Request: b) Please confirm whether the risk reduction factor of 2 that was applied to tethered escort tugs responding to prevent a powered grounding incident, as described on PDF page 11 of reference ii), has been validated for the Trans Mountain tanker sailing route. If yes, please provide this validation. If no, please explain why not.	DNV GL confirms that a risk reduction of 2 was applied to powered grounding when a tug is tethered to the tanker. This factor is supported by expert review in multiple projects and also by specific tug response simulations.	Trans Mountain's response provides an assertion without offering supporting evidence. The information request asked for the evidence behind the choice to apply a risk reduction factor of 2. Trans Mountain has simply asserted this reduction factor to be accurate without providing the requested evidence to back up their claim. If there are multiple projects and simulations that support the chosen risk reduction factor, and if these were used as the supporting evidence in determining the risk reduction factor, please supply the information necessary to evaluate the evidence that was used by these projects and simulations to validate their chosen risk reduction factors. Given that Trans Mountain has not provided this evidence, I submit that the response is inadequate.		
2.05.2.c	Reference: iv) A3S5F8, TERMPOL 3.15, General Risk Analysis and Intended Methods of Reducing Risks, Full Report. Request: c) In section 3 of Appendix 4 in reference iv), the report states that: "As discussed in Section 2.3 above, the basic parameters in MARCS represent North Sea average shipping operations in the mid to late 1990s." Please provide an exhaustive account of how the MARCS model has been updated to represent current and local shipping operations in British Columbia	North Sea average conditions in the 1990s remain the starting point, but all models are adjusted to include the risk controls applied. DNV together with Trans Mountain focused on identifying current and extraordinary risk-reducing measures so that the frequency of a credible worst case oil spill event remains low. Please refer to the risk-reducing measures in Section 13 of Volume 8C TERMPOL 3.15 (Filing ID A3S5F6). The MARCS model has been successfully used in many global jurisdictions and an exhaustive account as requested by the intervenor is not required in order to assess the risk of increased tanker traffic as a result of the	The request asked for an "exhaustive account of how the MARCS model has been updated to represent current and local shipping operations in British Columbia since 2010." Trans Mountain's response refers to the fact that the MARCS model has been successfully used in many global jurisdictions. It however, does not account for local conditions in British Columbia, nor does it explain how "success" was evaluated in their statement. The purpose of validating the model for these conditions is to assess the accuracy of the inputs used in the MARCS model for conditions in B.C. Yet Trans Mountain did not account for whether		

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	since 2010, including the process of validating the model for these conditions.	project. Trans Mountain is confident that the evaluation of marine risk undertaken by TM and its experts, which includes DNV, have been carried out with a high degree of due diligence, fulfill NEB requirements (Filing ID A3V6I2) and describe the range of environmental effects that could result from an oil spill along the marine shipping route. The results are easily interpretable and allow for the assessment of additional risk reducing measures (preparedness and planning measures) that can effectively contribute to reducing both probability and consequence.	or not the model has been validated for local conditions in B.C. nor provide an exhaustive account of how it was validated. The validation of both the MARCS model and of the inputs applied to the model are essential for assessing the accuracy of outcomes from the model. I therefore submit that Trans Mountain's response is inadequate.		
2.05.2.d & 2.05.2.d.1	Reference: v) A3Y3W4, Trans Mountain Responses to Weaver A IR No. 1. Request: d) In response to Weaver A IR No 1.10.5.r in reference v), Trans Mountain notes that "the effect of traffic separation schemes and movement restriction areas in the marine RSA sailing route is estimated in the MARCS model by modelling only one-way traffic in the TSS area. However, the directional sailing lanes are modelled with some overlap to account for potential stray vessels." (p. 102 of 148). Please provide an account of how this approach has been validated for the Trans Mountain tanker sailing route. d.1) Please also provide a sensitivity analysis of the MARCS model with respect to the uncertainty inherent in this approach to modelling the traffic separation scheme.	The reason for modeling the route as explained in Weaver A IR No 1.10.5.r is because of the manner in which the route is demarcated on navigation charts. The major portion of the TSS allows for one way traffic to move well-separated from vessels travelling in opposing direction. In certain portions, e.g., Segment 5, the route is two way traffic. In the harbour, tankers enjoy one way passage. Thus the approach is well validated. d.1) Considering that this reflects the actual route, and validated by AIS tracking review, a sensitivity analysis serves no purpose and is not provided. For AIS track overview that matches the modeled route, please refer to Volume 8C, Termpol 3.2, Figure 2-1 (Filing ID A3S4R7).	Trans Mountain's response provides an assertion without offering supporting evidence. The information request asked for the evidence behind the chosen approach to modelling marine traffic lanes, not simply the rationale for it Trans Mountain has asserted that their approach to modelling marine traffic lanes is accurate based on their rationale without providing the requested evidence (including the validation and sensitivity analysis) to back up their claim. I therefore submit that the response is inadequate.		
2.05.2.f	Reference: i) A3S5F4, TERMPOL 3.15, General Risk Analysis and Intended Methods of Reducing Risks, Full Report. Request: f) Please provide a detailed account of how the wind rose data provided on PDF page 33 of reference i) has been validated for	The information is based upon data filed in Technical Report TR 8C 10 Supplemental TR S02, Volume 8C, Meteorological and Oceanographic Data (Filing ID A3S4U6). The data and information with respect to these parameters were obtained from sources ranging from government agencies to research organizations and universities. Please refer to the report for more details.	Trans Mountain's response provides general information regarding the source of the data without offering supporting evidence that was requested. The information request asked for the evidence that supports the accuracy of the data as a predictive input in the model. Simply stating that the data was "obtained from sources ranging from government agencies to research organizations and universities" does not		

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	accuracy as a predictive input in the model.		answer the request because the source of the data does not speak to the data's accuracy as a predictive input in the model. I therefore submit that the response is inadequate.		
2.05.2.g	Reference: ii) A3S5F6, TERMPOL 3.15, General Risk Analysis and Intended Methods of Reducing Risks, Full Report. Request: g) Please provide a comprehensive account of how the extended escort tug that is proposed under Case 1a in reference ii) is factored into the MARCS model.	Case 1a applies the benefit of a dedicated escort tug to areas of the shipping route where one is currently not required; i.e., a tethered tug accompanies the tanker through entire segments 3, 4, 6 and 7. Current tug escort requirements cover segments 1, 2, partially 3, entire 5 and partial 6. Please note that Case 1a is replaced with NewCase 1c. For details please refer to response to NEB IR TERMPOL Rpt and Outstanding Filings (Filing IDs A4G3U5, A4G3U6, A4G3U7).	The information request asks for a comprehensive account of how the extended escort tug is factored into the MARCS model. The application was already clear that Case 1a (now NewCase 1c) extends the escort tug through entire segments 3, 4, 6 and 7. However it did not explain in detail how this extended escort tug was applied within the model itself (i.e. weighting, probabilistic applications, etc.) in order to arrive at the resulting conclusions. I therefore respectfully submit that Trans Mountain has not answered the request.		
2.06 b)	Page 3-1 of the report cited in reference i) reads: "The difference in approach is due principally to the fact that, unlike HHRAs that tend to focus on routine operations consisting of planned activities for which chemical exposures and any corresponding health risks can be anticipated and assessed on the basis of known or reasonably welldefined exposure scenarios, spills represent low probability, unpredictable events for which the exposures and any associated risks must necessarily be assessed on the basis of strictly hypothetical scenarios. For the purposes of the present assessment, Page 33 of 66Trans Mountain Response to Weaver A IR No. 2 rather than attempting to combine the probability of occurrence of these unpredictable events with the consequences of exposure to arrive at quantitative risk estimates, it was assumed a priori that the oil spill events had taken place, leaving the assessment to focus on the potential health effects that could occur under each simulated spill scenario." Please confirm that it meets industry best practice to conduct qualitative HHRA's, as opposed to quantitative studies when examining the human health impacts of a	No response.	There seems to have been some confusion about this response as both of the subquestions (b.1 and b.2) received responses, but the main question (b) did not. A response is still needed for question 2.06 b) – specifically: Please confirm that it meets industry best practice to conduct qualitative HHRA's, as opposed to quantitative studies when examining the human health impacts of a spill.		

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	spill.				
2.06 d)	Please comment on why Trans Mountain chose the specific inputs that were used for wind direction when conducting this assessment. Do the wind direction inputs represent a worst case scenario and/or are they representative of the average wind direction for a calendar year and/or summer months?	The date and time selected for the deterministic modelling were based on an analysis of the stochastic simulations for that site, primarily on those start dates/times that produced the median amount of oiled shoreline, as well as, from that set, the start date/time that produced the greatest evaporation, so as to provide conservative (i.e., large) values of air emissions for the Human Health and Risk Assessment. The selection of a summer month was intended to favour a time period with the greatest potential for ecological damage. The wind direction inputs are not wind average; instead, they represent observed wind conditions varying hourly at each grid point at the selected time. In response to NEB IR No. 2.024 (Filing ID A3Z4T9), two additional deterministic runs were conducted, with start date and time selected so that they would be dominated by two dissimilar wind conditions from the conditions that dominated the simulation provided in the Application. The spill simulations are described in the Follow-up to NEB IR No. 2.024 and attachment (Filing IDs A4A1Z8 and A4A1Z9), and the Human Health Risk Assessment Memo NEB IR No. 2.024b Final (Intrinsik Environmental Sciences Inc. September 2014; Filing ID A4A7S1) can be found on the NEB web site.	Additional clarity is needed in order to fully respond to this question. Part of the question was whether the wind direction inputs represented a worst case scenario. As this was a Human Health Impact assessment Trans Mountain's claim that they chose certain conditions that represent the greatest potential ecological damage is not answering whether the scenario for both Arachne Reef and Westridge terminal constitute worst case scenarios in terms of impact on human health. While Trans Mountain has conducted two additional deterministic runs for the Westridge terminal location, no subsequent modeling has been done for the Arachne Reef location. As can be seen in Filing ID A3Y1F1 (which accompanied the Human Health Risk Assessment report), the chemical plumes are all modelled away from major population centers, leading to the question from the intervenor – does this Human Health Risk Assessment conducted by Trans Mountain constitute a worst case scenario when it comes to the Arachne Reef location and the West Ridge location.		
2.06 d.1)	Please provide the information that was used to determine the average wind speed, direction and wave height in order to map out how and where spilled oil and toxic air pollution would travel in the scenario provided.	Average wind conditions were not used in the simulation, rather the actual hourly observed winds that led to the spill behaviour, selected according to the above criteria.	The intervenor accepts the proponents' response that average wind conditions were not used in the simulation, however I would still challenge that the intention of this question was not fully responded to. Of critical interest to those on the south island are the likely impacts we would experience in the case of a spill off our coast. To this end, understanding how Trans Mountain arrived at the specific conditions used in their scenarios is of critical importance. Specifically, it is important to know how often the conditions used occur at the location selected, and whether these		

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			conditions would in fact create the "conservative" scenario that Trans Mountain purports to have created.		
2.06 h)	Page 5-2 of the report cited in reference i) reads: "In all cases, the predicted one-hour average concentrations of the COPC were only seen to exceed the corresponding Exposure Limits over water, suggesting that individuals on land would not experience any health effects as a result of the spill." Please confirm that the results detailed in section 5 do not represent conclusions that can be extrapolated to any scenario outside of the precise conditions used in this study. If they can be extrapolated, please confirm.	Not confirmed. Please refer to response to Weaver A IR No. 2.06g for a description of the risk-based approach adopted by Trans Mountain to evaluate potential effects of accidents and malfunctions at the Westridge Marine Terminal and along the marine shipping route.	On page 4-20 the report specifically notes that "The results of this assessment necessarily apply to the specific scenarios that were chosen". It therefore is difficult to understand how the "conclusions" of this study, where so many of the details about who experienced the health impacts was dependent on the specific conditions chosen, could be applied more broadly. For instance, page 5-8 reads "For the respiratory irritant and neurotoxicant mixtures, the coverage was predominantly over water; whereas the eye irritant mixture coverage extended over both land and water. The areal extent of the mixtures did not differ substantially from the maximum extent of the individual COPC comprising the mixtures". This statement is subject to the specific conditions utilized that resulted in a scenario where the coverage areas occurred largely over water. As noted in Trans Mountain's response, the wind direction at Kelp Reefs only corresponds in some way to their model 51% of the time. A more complete response is requested from Trans Mountain to explain how the results only apply to the specific scenarios that were chose but the conclusion can be applied more broadly.		
2.06 i)	Please confirm that the statement on page 5-8, which read: "For the respiratory irritant and neurotoxicant mixtures, the coverage was predominantly over water; whereas the eye irritant mixture coverage extended over both land and water. The areal extent of the mixtures did not differ substantially from the maximum extent of the individual COPC comprising the mixtures" cannot be	Refer to response to Weaver A IR No. 2.06h	On page 4-20 the report specifically notes that "The results of this assessment necessarily apply to the specific scenarios that were chosen". It therefore is difficult to understand how the "conclusions" of this study, where so many of the details about who experienced the health impacts was dependent on the specific conditions chosen, could be applied		

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	extrapolated beyond the spill modelled in this study and the exact conditions used in this study. If it can be extrapolated, please explain.		more broadly. Specifically, page 5-8 reads "For the respiratory irritant and neurotoxicant mixtures, the coverage was predominantly over water; whereas the eye irritant mixture coverage extended over both land and water. The areal extent of the mixtures did not differ substantially from the maximum extent of the individual COPC comprising the mixtures". This statement is subject to the specific conditions utilized that resulted in a scenario where the coverage areas occurred largely over water. As noted in Trans Mountain's response, the wind direction at Kelp Reefs only corresponds in some way to their model 51% of the time. A more complete response is requested from Trans Mountain to explain how the results only apply to the specific scenarios that were chose but the conclusion can be applied more broadly.		
2.07.1.d.1	Request: d) In response to Weaver A IR No 1.13.1.o on page 142 of reference iii), Trans Mountain states that "…as with other heavy oils, factors can contribute to oil submergence and/or sinking. As such, oil spill response plans and Response Organizations include strategies, tactics and equipment to respond promptly, minimize the potential for oil submergence or sinking and address submerged or sunken oil." Please provide a comprehensive account of: d.1) Any and all equipment owned and operated by WCMRC to recover sunken oil.	By the nature of the intervenor's question it appears that the Intervenor is of the understanding that any spilled diluted bitumen carried on the Trans Mountain system will immediately sink if released to the marine environment. This is not the case. As such, it is important to first review background information regarding diluted bitumen and its potential to become submerged or sink. Thereafter response strategies will be discussed. d.1) The products shipped on the Trans Mountain system are, by tariff, restricted from having a specific gravity greater 0.94 and will not sink unless exposed to a combination of conditions. Tests conducted for Trans Mountain, by Environment Canada (2013), and by SL Ross (2010, 2011) for the Northern Gateway application, show that weathered representative samples of diluted bitumen (CLB and AWB) are expected to remain floating on dense saltwater. While the Environment Canada Report does not provide a time element for the densities of	The nature of the intervenor's question does not imply and understanding that diluted bitumen will sink. It implies and understanding that it could sink (as is also noted in Trans Mountain's response). Given that diluted bitumen could sink or submerge, and given that Western Canada Marine Response Corporation (WCMRC) is responsible for responding to a spill, the intervenor is requesting a list of any and all equipment owned and operated by WCMRC to recover sunken oil. Trans Mountain has not provided the requested list in its response and hence I submit that Trans Mountain has not adequately responded to the information request.		

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		samples tested, the Gainford report (in the Application, Volume 8C, TR 8C-12 S7 – A Study of Fate and Behavior of Diluted Bitumen Oils on Marine Waters) showed that fresh and weathered representative samples of diluted bitumen (CLB and AWB) would float on freshwater for eight days or more depending on local factors such as sediment and mixing energy. The salinity of Burrard Inlet water has a greater density than freshwater. The same tests showed that conventional skimming equipment is capable of removing both fresh and weathered oil. Prompt response is important given that the weathering process is in part related to the time over which oil is exposed to the environment. Westridge loading operations will be conducted inside a pre-deployed boom, which would contain a release. Additional boom and response equipment, including skimmers, will be maintained on site. In the unlikely event of a spill, the responsible party (Trans Mountain for a pipeline spill, the tanker owner for a tanker spill) would work with regulatory agencies in a Unified Command to determine both response and remediation strategies appropriate for the specific circumstances of the event. Response strategies employed to avoid sinking oil are those focused on: • Controlling the source of the spill • Preventing released oil from entering a water body • Containing, intercepting and promptly removing oil from the water surface • Removing stranded oil that could be remobilized from the shoreline The behavior and fate of spilled dilbit (bitumen blended with condensate or synthetic crude oil) was canvassed extensively in the Joint Review Panel hearings relating to Northern Gateway, and the Panel in assessing the issue accepted the following facts:			

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		• The maximum initial density of the dilbit would be 940 kilograms per cubic metre, in conformance with the proposed pipeline tariff specification. When initially spilled, the density would be less than that of fresh water or salt water, making dilbit a floating oil. • Experts agreed that dilbit is not a simple two-phase mixture of bitumen and condensate, but is instead a new, cohesive, blended product. When spilled into water, lighter hydrocarbon fractions of the entire blend would begin to evaporate. As lighter fractions evaporate, the viscosity of the weathered dilbit would increase, and evaporation of remaining lighter fractions would be progressively inhibited. • Past examples of spills do not indicate that products similar to dilbit are likely to sink within the timeframe for response options, or in the absence of sediment or other suspended particulate matter interactions. • Dilbit may sink when it interacts with sediment or other suspended particulate matter, or after prolonged weathering. • Bench-top and wave tank testing indicated that dilbit is not likely to sink due to weathering alone within a short to medium timeframe. The evidence indicated that multiple factors, such as the interaction between density, viscosity, potential emulsion formation, and environmental conditions must all be examined together in considering the fate of spilled oil, including the possibility of sinking. Much of the evidence that the Panel heard did not consider these factors collectively. • The weight of evidence indicates that, when spilled in water, dilbit with a maximum density of 940 kilograms per cubic metre would behave similarly to an intermediate fuel oil or lighter heavy fuel oil with a density less than 1,000 kilograms per cubic metre. Various experts, including those involved in spill response, said that these products provide reasonable analogs			

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		for dilbit behaviour as it relates to oil spill response. • Transport Canada said that a response organization would be likely to treat a dilbit spill as a blended crude oil product spill.			
2.07.2.a	Reference: i) A3S5J0, TMEP Oil Spill Response Simulation Study, Arachne Reef and Westridge Marine Terminal, Full Report. ii) A3S4T7, TERMPOL 3.5 & 3.12 Route Analysis & Anchorage Elements, Full Report iii) A3S5I9, Review of Trans Mountain Expansion Project: Future Oil Spill Response Approach Plan, Recommendations on Bases and Equipment, Full Report. Request: a) Given that reference ii) describes significant differences in the nature of the route east and west of Race Rocks, and given that reference iii) describes the need to prepare a spill response plan that accommodates the differences east and west of Race Rocks, please provide an oil spill scenario comparable to what is provided in reference i) for a spill that occurs west of Race Rocks.	A response to this request was provided in Trans Mountain's response to Weaver A IR No. 1.13.2a (Filing ID A3Y3W4). From a practical perspective, the strength of the stochastic approach is that it shows, in a probabilistic sense, where spilled oil could go in the event of an accident. The probability contours generated through stochastic modelling are valuable for informing spill response and preparedness planning. They also provide a transparent and defensible basis for describing the range of environmental effects that could result from a spill along the marine shipping route. Trans Mountain is confident that the evaluation of potential environmental effects at representative locations fulfill NEB requirements (Filing ID A3V6I2) and describe the range of environmental effects that could result from an oil spill along the marine shipping route. Evaluation of potential environmental effects at other sites would not have changed assessment conclusions or identified the need for additional preparedness and response planning measures. As such, additional oil spill modeling shall not be carried out.	Trans Mountain's application describes differences in the nature of the route East and West of Race Rocks, including differences in wave and wind that could drastically affect the extent of verticle mixing, the direction and speed at which oil travels (and hence the ability of containment booms to contain spilled oil) and the wind and wave conditions. As an example, in response to Weaver IR 2.09.a Trans Mountain provided a table outlining the frequency and occurrence (% of the year) of Beaufort Scale Wind Speeds at different locations throughout the year. At Race Rocks, wind speeds reach Beaufort Scale 5 (B5) or higher roughly 37% of the year. In comparison, wind conditions at Saturna Island, near Arachne Reef only reach speeds of B5 or higher roughly 12.66% of the year. Response organizations like WCMRC are not required by law to respond to a spill when wind speeds reach B5 or higher. The great disparity in the frequency of occurrence of B5 and higher wind speeds at these two locations would have a significant impact on response efforts and the rate of recovery and containment of spilled out. Wave conditions are only one of several significant differences in the nature of the route east and west of Race Rocks. The intervenor therefore respectfully challenges Trans Mountain's conclusion that an oil spill scenario west of Race Rocks would not have changed assessment conclusions or identified the need for additional preparedness and response planning measures. Indeed, without running a second spill scenario, Trans Mountain cannot definitely arrive at this conclusion, particularly given the points above. The intervenor therefore submits that Trans		

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			Mountain has not provided the requested spill scenario and therefore has not adequately responded to the information request.		
2.07.2.e.5	Reference: i) A3S5J0, TMEP Oil Spill Response Simulation Study, Arachne Reef and Westridge Marine Terminal, Full Report. Request: e) In the Arachne Reef Scenario on PDF page 19 of reference i) the report states that: "The 4 days length period was selected based on the slick thickness on water, which then becomes too thin to be efficiently recoverable after the end of the fourth day." In response to Weaver A IR No 1.13.2.l Trans Mountain reiterates that "It became evident as the simulation progressed that by the end of day 4, the remaining oil on water was in the form of a very thin slick, for which skimmer operations, even with boom concentration, were not effective." Please: e.1) Confirm that the simulation provided in reference i) is a computer simulation that is based on a computer model. e.3) If yes to Weaver A IR No 2.7.2.e.1, please confirm that the observation that after 4 days "the remaining oil on the water was in the form of a very thin slick, for which skimmer operations…were not effective", would have been the result of inputs and assumptions applied to the computer model. e.5) If yes to Weaver A IR No 2.7.2.e.3 please confirm if the model inputs that contributed to this result were based off of any existing studies of diluted bitumen in marine environments. If yes, please provide a list of these studies and explain why a standard 10-day response period is still being proposed instead of a four-day response period, given these studies. If no, please explain why this parameter was used in the model if it does not reflect a scientific understanding of diluted bitumen.	e) e.1) The simulation provided in reference i) is a computer simulation that is generated by a computer model. e.3) The observation that after 4 days "the remaining oil on the water was in the form of a very thin slick, for which skimmer operations…were not effective", was the result of inputs and assumptions applied to the computer model. Inputs and assumptions were taken as realistic as possible, ranging from environmental conditions to de-rated capacity for skimmer. e.5) The model inputs, as they affect the specific behaviour of diluted bitumen, were based primarily on a large scale study into diluted bitumen properties that formed part of the Application, [Volume 8C, S7 – A Study of Fate and Behaviour of Diluted Bitumen Oil on Marine Waters, Filing IDs A3S5G2, A3S5G4, and A3S5G5]. The most significant aspect of that study was a determination of the rate of change of density as the diluted bitumen weathers. The evaporative flux in our model was calibrated to the Gainford study, so that there is considerable certainty with respect to how long the diluted bitumen would stay afloat, estimated to be greater than 10 days when floating on seawater. Other aspects of bitumen weathering were parameterized based on equations gleaned form a number of sources, provided in the References section of this response. The intervener appears to suggest that because in the specific simulation the spill was addressable on-water for four days, future planning of on-water oil spill response should be truncated to only four days. This is not the case. The four day response at Arachne Reef is in response to local oceanography. Another site may	Trans Mountain's response to Weaver A. IR 2.07.2.e.5 appears to suggest that Trans Mountain understands the statement quoted in reference i) to mean that recovery efforts had successfully concluded after only four days because all oil that could be recovered was recovered by that point in time. In contrast, the intervenor understands the conclusion quoted in reference i) to imply that clean-up efforts could have continued after four days, except that the oil had become too thin to be recovered. There is an important discrepancy between Trans Mountain's and the intervenor's interpretations of the quote in reference i). As Weaver A. IR 2.07.2.e.5 is based on the intervenor's interpretation of this quote, a clear explanation of why the intervenor's interpretation is wrong is respectfully requested in order to ensure a complete and adequate response. In the event that the intervenor is correct in his interpretation, it is requested that Trans Mountain please explain why the parameters that led to oil becoming too thin to be recovered after only four days was used in the model if it does not reflect a scientific understanding of diluted bitumen.		

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		present different features. Each spill is different and response would depend on conditions prevailing at the time. A 10-day response together with significantly reduced response time is a conservative approach that takes this into account and is in keeping with Federal planning standards as well as the diligent approach to oil spill response planning proposed by WCMRC in consultation with Trans Mountain.			
2.08.a	Request: a) Has Trans Mountain conducted any new tank studies or other scientific studies exploring how diluted bitumen behaves in saline water in the presence of suspended particles since the first round of intervenor information requests were submitted? If no, why not? If yes, please provide a copy of each new study.	No additional studies on diluted bitumen behavior have been conducted by Trans Mountain following the Application. Based on publicly available information, Trans Mountain is aware of several ongoing research programs and initiatives regarding diluted bitumen products that involve Federal agencies and industry. Recently announced studies include those led by the Royal Society of Canada, the U.S. National Academy of Sciences, Government of Canada funded research at several universities and institutions, Alberta Innovates and NRCan with industry participation through the Canadian Association of Petroleum Producers (CAPP), and the American Petroleum Institute (API). Trans Mountain continues to assess research results in the subject and is participating as an industry member with the CAPP to identify additional research priorities. Also refer to responses to NEB IR No. 1.63a (Filing ID A3W9H8).	The second part of the information requested asked Trans Mountain to explain why it has not conducted any new tank studies or other scientific studies exploring how diluted bitumen behaves in saline water in the presence of suspended particles. Trans Mountain has not yet done so. I therefore submit that the Trans Mountain's answer is incomplete.		
2.10.a	Reference: i) A4E2V0, Table 1 Intervenor Requests for Information from the Western Canada Marine Response Corporation. Request: a) In response to Province of British Columbia IR 1.1.67.a and IR 1.1.67.e [pp. 8 to 10 of 18 in reference i)], WCMRC provides a list of organizations it currently has mutual aid agreements with as well as information on the equipment that can be "cascaded in"	The intervenor's question cannot be answered in the manner asked. As noted in reference citation i) for the Province BC IR No. 1.1.67e (Filing ID A3Y2Z1): In general, the concept of mutual aid is based on the availability of equipment from donating organizations that are above their minimum response equipment retention levels (also known as resident non-cascadable resources). The release of equipment to satisfy a mutual aid request is usually contingent upon approval of the	Weaver A. IR 2.10.a requested "the total recovery capacity and length of containment boom that could be contributed for each organization with which WCMRC has a mutual aid agreement." (emphasis added). The intervenor understands that the concept of mutual aid is based on the availability of equipment that are above the minimum response equipment retention levels of donating organizations. Since those minimum retention levels are pre-established, and since the current total		

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	to support its response efforts in the event of an oil spill. For instance, WCMRC notes that, within 24-hours of notification, National Response Corporation could contribute a total de-rated recovery capacity of 3,819 tonnes per day. Please provide the total recovery capacity and length of containment boom that could be contributed for each organization with which WCMRC has a mutual aid agreement and within the following time frames: a.1) Within 24 hours of notification. a.2) Within 96 hours of notification. a.3) Within 10 days of notification.	donating organization's members or regulatory oversight agency. As with an analogous response to wild land fires, there is no guarantee that every item on a mutual aid partner's equipment list will be available to support a mutual aid request, especially during concurrent responses.	equipment capacities of all prospective donor organizations are known, then at the very least information on the maximum available equipment that could be cascaded in an ideal scenario should be known. Indeed this information is already provided for the National Response Corporation. Trans Mountain could then take this best-case scenario and apply credible travel time estimates to ascertain the likely point at which that equipment could be in operation in B.C. in a credible best case scenario. Since Trans Mountain has not provided this information, I submit that the answer is currently incomplete.		
2.10.b	Reference: i) A4E2V0, Table 1 Intervenor Requests for Information from the Western Canada Marine Response Corporation. Request: b) In response to Province of British Columbia IR 1.1.73.o and IR 1.1.73.q WCMRC [pp. 12 to 15 of reference i)] WCMRC outlines several technologies and techniques for recovering or responding to submerged or sunken oil. Please provide a comprehensive list of the equipment owned by WCMRC that can be used to respond to a submerged or sunken oil spill. Please also include the oil recovery rate of each piece of equipment.	Please refer to response to Weaver A IR No. 2.07.1d. The Intervenor's question regarding oil recovery rates cannot be answered in the manner asked. A literature search from multiple sources that discussed submerged or sunken oil recovery techniques did not reveal any published recovery rates/percentages for spilled oil or dilbit.	The intervenor requested that Trans Mountain provide a comprehensive list of the equipment owned by WCMRC that can be used to respond to a submerged or sunken oil spill. In response, Trans Mountain referred the intervenor to its response Weaver A IR No. 2.07.1d. As noted above in this document, Trans Mountain's response to Weaver A IR No. 2.07.1d does not provide the requested list. As such, I submit that Trans Mountain's answer remains incomplete.		
2.10.c	Reference: iii) A4E2V3, Western Canada Marine Response Corporation "At a Glance" North Coast Operations. Request: c) In reference iii) WCMRC states it has the capacity to skim 92.3 tonnes of oil per hour with a total storage capacity of 138.7 tonnes in its North Coast Operations. Where will WCMRC store additional oil after its storage capacity is exhausted in the first hour and a	The information requested regarding North Coast operations is not within the scope of this proceeding and not relevant to the NEB's List of Issues.	There is nothing in the proposed application that would definitively prohibit oil tankers that originate from Westridge Marine Terminal and navigate the through the marine study area to then proceed north along the B.C. coast. As such, North Coast operations directly apply to issue 5 of the NEB's List of Issues ("The potential environmental and socio-economic effects of marine shipping activities that would result from the proposed Project, including the potential effects of accidents or malfunctions that may occur.") and hence is		

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	half of skimming operations?		within scope of this proceeding. I therefore submit that Trans Mountain's response is inadequate.		