

CANADA ENERGY REGULATOR

IN THE MATTER OF the *Canadian Energy Regulator Act*, S.C. 2019, c. 28, s. 10, as amended and the Regulations made thereunder;

AND IN THE MATTER OF the Certificate of Public Convenience and Necessity OC-065 held by Trans Mountain Pipeline ULC, in respect of the Trans Mountain Expansion Project;

AND IN THE MATTER OF Detailed Route Hearing MH-027-2020 and other detailed route hearings affected by the statements of opposition filed on behalf of the S'ólh Téméxw Stewardship Alliance;

AND IN THE MATTER OF the Notice of Motion of Trans Mountain, dated May 11, 2020.

AFFIDAVIT OF DAVID SAFARI

May 11, 2020

To: The Secretary
Canada Energy Regulator
Suite 210, 517 – 10th Avenue S.W.
Calgary, AB T2R 0A8

AFFIDAVIT OF DAVID SAFARI

I, David Safari, of Calgary, Alberta, MAKE OATH AND SAY AS FOLLOWS:

1. I am Executive Vice President, Trans Mountain Expansion Project (“**Project**” or “**TMEP**”) for Trans Mountain Pipeline ULC (“**Trans Mountain**”). As such, I have personal knowledge of the matters in this Affidavit, except where stated to be based on information and belief, in which case I believe the same to be true.

I. Qualifications and Experience

2. I joined the Project team in 2015. Prior to the Project, I worked for Laricina Energy as Vice President, Facilities and Statoil Canada as Senior Director, Projects. I have more than 30 years of industry experience in the energy sector. I hold a Bachelor of Science degree in Chemical Engineering (Oil & Gas) from the Sharif University of Technology in Tehran and have extensive domestic and international experience with large-scale construction projects.

II. Construction Schedule, Construction Limitations and Priority Areas

3. In Alberta, Project construction is well underway within Spread 1 (KP 0-49), Spread 2 (KP 49-338) and at the Edmonton Terminal. In British Columbia, significant terminal construction work is ongoing at the Burnaby Terminal and Westridge Marine Terminal. Pump station construction has also commenced in British Columbia.

4. Trans Mountain’s construction schedule for the Project has been designed to achieve a planned in-service date of December 31, 2022 (“**In-Service Date**”). As commissioning the

pipeline will take at least three (3) months, all TMEP construction for all spreads must be complete no later than September 30, 2022 to achieve the In-Service Date.

(a) Coquihalla Summit Area in Spread 5B

5. Construction in the Coquihalla Summit area within Spread 5B from KP 990 to KP 1015, as shown on Plan, Profile and Book of Reference (“**PPBoR**”) Sheets M002-PM03011-056 through M002-PM03011-064 (the “**Coquihalla Summit Area**”) is subject to significant seasonality constraints.

6. Specifically, steep slopes, geohazards and avalanche risks within the Coquihalla Summit Area make construction activities unsafe and technically unfeasible when there is heavy snowpack in the area (typically early November until May). Even when there is no snowpack, the steep terrain requires smaller specially-trained construction crews and slower construction progression relative to other portions of the Project route.

7. In addition, construction activities between March 26 and August 17 in the Coquihalla Summit Area are subject to the migratory bird nesting window, meaning that (i) construction can only occur if additional measures (such as nest sweeps) are completed, and (ii) construction must be halted or adjusted if any active nests are identified. Constructing within the bird window therefore (i) takes significantly longer and is more expensive than constructing outside the bird window; and (ii) introduces additional risks and uncertainties if active nests are present.

8. In order to meet the In-Service Date, Trans Mountain must complete the following activities within the Coquihalla Summit Area sequentially:

- (a) *Tree clearing, hauling, grading and burning.* These activities, including initial setup and takedown, are expected to take approximately four (4) months. In order to complete these activities before heavy snowpack conditions in winter 2020, mobilization should commence in July 2020 and clearing activities must commence on August 18, 2020.

- (b) *Remaining pipeline construction activities (final grading, blasting, pipe hauling, pipe stringing, trenching, welding, coating and backfilling).* These activities are expected to take approximately seven (7) months, which generally coincides with the annual construction window in this area (May to November). As a result, these activities are scheduled to commence immediately following snow melt in 2021 so that they can be completed prior to heavy snowpack conditions in 2021.

- (c) *Pipeline hydrotest and valve installation.* There are four hydrotest sections for Spread 5B. Hydrotest activities are scheduled to start in March 2022 and will take approximately three (3) months to complete. Following a successful hydrotest, three (3) mainline block valves must be installed at select points along Spread 5B. Valve installation is scheduled to start at the end of June 2022, is expected take three (3) months to complete, and, as noted above, must be completed by September 30, 2022 to meet the In-Service Date.

Hydrotesting cannot be safely or practically conducted in the Coquihalla Summit Area between November and March due to the high altitude and steep terrain. Hydrotesting requires transporting water from available non-frozen sources, which, in the Coquihalla Summit Area, includes wells or surface water bodies. Such water

sources may not be available in the winter (they may be frozen or at very low levels) and transporting the water, for example, through pipes or hoses, is not practical or safe in the Coquihalla Summit Area during the winter months due to the terrain, avalanche risks, deep snow and sub-zero temperatures.

9. In order to make the necessary arrangements to have contractors engaged and on-site by the end of July 2020 to prepare for tree clearing in the Coquihalla Summit Area on August 18, 2020, Trans Mountain needs to enter into contracts and make significant financial commitments to construction contractors in early June 2020. Trans Mountain would be incurring extraordinary risk if it were to make commitments to contractors prior to having certainty as to whether the PPBoR sheets for the Coquihalla Summit Area will be approved. This means that, if detailed route approval is not obtained by early June 2020, Trans Mountain will not be in a position to commence tree clearing in the Coquihalla Summit Area by August 18, 2020.

10. Moreover, if pipeline construction in the Coquihalla Summit Area is not completed by the end of 2021, these activities will need to be completed in the 2022 construction season (i.e., summer/fall of 2022), requiring hydrotesting and valve installation to occur in the spring/summer of 2023 and pipeline commissioning in the fall of 2023. Such a scenario would delay the In-Service Date by up to eleven (11) months and result in incremental construction costs of approximately \$50-60 million CAD. These costs are a result of adding a third construction season, including direct and indirect labour, equipment and temporary infrastructure.

(b) Construction Schedule and Priority Areas in Spread 7

11. Project construction in Spread 7 involves a very large scope of work with several complex and high-risk sections that may take up to two years to complete. As construction in Spread 7 must

be complete by July 2022 to meet the In-Service Date (as discussed below), construction must commence in July 2020 to manage construction requirements, execution risks and avoid delay to the In-Service Date.

12. For this reason, construction in the areas subject to significant scheduling constraints and execution risks (the “**Spread 7 Priority Areas**”) is scheduled to commence in July 2020. While there is some flexibility (in the order of weeks, not months) with respect to the commencement date of certain construction activities in the Spread 7 Priority Areas, if substantial construction progress in these areas cannot be achieved during the 2020 construction season, Trans Mountain’s ability to manage the risks around construction will be significantly constrained, leading to a material risk that the In-Service Date will be delayed by several months and potentially more than a year.

13. For instance, construction in three of the Spread 7 Priority Areas (discussed below) includes multiple watercourse crossings that must occur during a six-week least-risk fish window, from August 1 to September 15. Required construction activities in those areas will take two construction seasons to complete, with riparian area tree clearing in the first season (2020) and watercourse crossing work in the second season (2021). If Trans Mountain is required to commence these works in 2021, they will not be complete until September 2022.

14. Moreover, if in-field risks materialize (such as historic contamination being detected) and Trans Mountain is not able to complete this watercourse crossing work in the 2022 least-risk fish window, then the next opportunity to do this work will be in August and September of 2023. As noted below, one of the watercourse crossing sites has a high groundwater table and expected

contamination from third party industrial activities, which, if encountered, could cause Trans Mountain to lose an entire construction season in that area.

15. If Trans Mountain does not have detailed route approval for these particular Spread 7 Priority Areas prior to the end of June 2020, it will not have sufficient time to engage contractors, mobilize equipment and personnel and conduct the necessary construction activities within the narrow 2020 least-risk window. This means that construction will be delayed by a year – to the 2021 and 2022 construction seasons – and, if construction risks materialize, may require a third season in 2023.

16. To bring the pipeline into service, Trans Mountain must conduct hydrotesting, valve installation and commissioning activities (a five-month process) after the pipeline construction activities are complete. Spread 7 will be hydrotested in two segments (from the start of Spread 7 in the Township of Langley to the Fraser River and from the Fraser River to Burnaby Terminal). This is scheduled to commence in early August 2022, or sooner if possible. After hydrotesting is complete, nine (9) mainline block valves and check valves will be installed, valve stations will be installed and commissioning activities will take place. These hydrotesting, valve installation and commissioning activities are expected to take approximately five (5) months to complete. As a result, all Spread 7 construction should be complete by the end of July 2022 to maintain the In-Service Date. If watercourse crossings are not completed until September 2022 (the end of the 2022 fish window), the In-Service Date will likely be delayed by two (2) months. If construction risks materialize requiring a third season (August-September 2023), the In-Service Date could be delayed by up to 14 months.

17. The below table lists the Spread 7 Priority Areas and describes: (i) the scope of work planned for the 2020 construction window; (ii) the lead time required to mobilize construction crews and equipment to commence construction; (iii) the current scheduled construction start date; (iv) applicable activity restriction windows; (v) whether the construction work will take place on private and/or public lands; and (vi) the rationale for designating the area as a Spread 7 Priority Area that must commence in 2020.

| Start KP - End KP ¹ (PPBoR Sheet Reference) | Area Description | Priority Works Scope of Work | Required Lead Time ² (Months) | Scheduled Start Date ³ | Restrictive Work Window (where applicable) | Land Ownership | Rationale for Designation as Priority Area Works |
|---|--|--|---|-----------------------------------|---|--------------------|--|
| 1155.700 - 1158.270 (Segment 7.1 - Sheet 1 and 2) | City of Surrey, West side of 197 St to GEC Crossing | - 2.57 km of pipeline installation - One Auger Bore crossing of CN Rail - 98A Ave detour installation - Tree clearing (including in riparian areas) - Golden Ears Connector MOTI Access Construction | 1 | July 2020 | Least Risk Fish Window August 1 - September 15 for riparian area | Public and Private | Construction beginning in July 2020 is required as there is high risk due to high groundwater in an industrial area with expected contamination. If contamination is encountered, pipeline construction activities may need to be suspended until the contamination is remediated. High groundwater could complicate remediation efforts and have an impact on productivity and consequently have an impact on the schedule. Construction beginning in August 2020 in certain riparian areas is also required due to the length of forested area with fish-bearing creek crossings present. The narrow least risk timing window, combined with the scope of activities subject to the restriction, means that construction requires <u>two</u> least risk “fish window” periods (i.e., 2020 and 2021) to complete in time for a December 2022 In-Service Date. |
| 1158.550 - 1159.350 (Segment 7.1 - Sheet 2) | City of Surrey, 182A St to 179 St | - Access and tree clearing required to clear riparian vegetation around Leoran Brook Creek. | 1 | August 2020 | Least Risk Fish Window August 1 - September 15 for riparian area | MOTI Public Lands | Work beginning in August 2020 is required due to the length of forested area with fish-bearing creek crossings present. This section of the route, which includes tree clearing within riparian areas, also requires <u>two</u> least risk “fish window” periods (i.e., 2020 and 2021) to complete in time for a December 2022 In-Service Date. |
| 1163.500 - 1164.800 | City of Surrey, Fraser Heights horizontal directional drilling | - Tree clearing | 2 | November 2020 | | Public and Private | This is an HDD through Fraser Heights and is one of the highest-risk HDD sections for the entire TMEP (along with the HDD under the |

¹ Station Series Event ID (SSEID) is an identifier that is used to refer to the whole centerline and construction footprint. KP identifiers in this table align with the approved Project Route as shown in SSEID 5.14.

² Lead time required for ramp-up of activities, e.g., lead times for contractors to procure required equipment, qualified personnel and supplies, access the site, transport materials to the site, etc. This is based on information from Trans Mountain’s contractor, Kiewit-Ledcor TMEP Partnership.

³ This is based on information from Trans Mountain’s contractor, Kiewit-Ledcor TMEP Partnership.

| Start KP - End KP ¹ (PPBoR Sheet Reference) | Area Description | Priority Works Scope of Work | Required Lead Time ² (Months) | Scheduled Start Date ³ | Restrictive Work Window (where applicable) | Land Ownership | Rationale for Designation as Priority Area Works |
|---|--|---|---|-----------------------------------|--|-------------------|---|
| (Segment 7.3 - Sheet 1 and 2) | ("HDD") including required access | - Access construction from City of Surrey streets - HDD work pad construction - 720m HDD Installation | | | | | Fraser River, discussed below) due to the length of the HDD, the geotechnical conditions that may be encountered and the limited availability of HDD rigs that are required for an HDD of this length. Commencement of this HDD in 2020 is critical because, should the 2020 attempt fail, a re-drill will be required. Failure could be caused by any number of reasons – obstructions could be encountered, drill hole could collapse, tools could become stuck, drill mud could frac-out resulting in loss of mud circulation, etc. A consequence of these failures could be the shifting the HDD drill path outside the currently approved alignment which requires additional time to accommodate regulatory requirements. Moreover, given the scope of the HDD, there are limited HDD drill rigs available for this work. If HDD activities at the Fraser Heights crossing are delayed or postponed, the drill rig may not be available, as it may be committed to other segments of the TMEP or to third parties. Further, if an HDD is ultimately unsuccessful at the Fraser Heights location, Trans Mountain will need to implement a contingency installation. Such a contingency would require lead time for regulatory approvals and contractor mobilization prior to construction. In light of these risks and timing considerations, a 2020 start of construction for this HDD is prudent in order to mitigate risk of schedule delay to the December 2022 In-Service Date. |
| 1165.200 - 1166.500 (Segment 7.3 - Sheet 3) | City of Surrey, MOTI North Surrey Truck Parking Lot Project Area | - Eastbound and westbound access construction off Highway 17 | 2 | October 2020 | | MOTI Public Lands | Construction in this area must commence in October 2020 to facilitate coordination efforts associated with MOTI's planned North Surrey Truck Parking Lot project. MOTI is currently scheduled to construct the access and intersection for this truck parking lot in |

| Start KP - End KP ¹ (PPBoR Sheet Reference) | Area Description | Priority Works Scope of Work | Required Lead Time ² (Months) | Scheduled Start Date ³ | Restrictive Work Window (where applicable) | Land Ownership | Rationale for Designation as Priority Area Works |
|--|--|---|---|-----------------------------------|--|----------------------|---|
| | | - One Auger Bore crossing across Highway 17 -1.3 km of pipeline installation | | | | | September 2020. Pipeline construction would then start in October 2020 and take 9 months to complete. After pipeline construction is complete, MOTI would then continue with their construction activities, which includes paving over top of the location where the pipeline is installed. |
| 1166.500 - 1168.000 (Segment 7.3 - Sheet 3 and Segment 7.4 - Sheet 1) | City of Surrey and City of Coquitlam, Fraser River HDD including required Access | - Access construction from Highway 17 - HDD working pad construction - 1.45 km HDD installation across the Fraser River | 2 | July 2020 | | MOTI and Crown Lands | This construction area includes a high risk HDD under the Fraser River, which is the longest HDD section of the entire TMEP (approximately 1,470 linear meters). This is one of the highest risk HDD sections for the entire TMEP due to the length, the geotechnical conditions that may be encountered and the limited availability of HDD rigs that are required for an HDD of this length. HDDs are typically the most complex execution methods for pipeline construction, with longer HDDs being more difficult installations due to unknowns. Execution risk is higher at the Fraser River, as Trans Mountain is crossing the largest body of water within Spread 7 and geotechnical data is limited along the bore path, making the possibility of encountering an unforeseen obstruction more likely. In the event that an obstruction is encountered, the HDD bore path would potentially have to be re-designed, and re-drilled. This would impact the construction schedule significantly for the Fraser River HDD, and Spread 7 as a whole. In addition, concerns regarding rig availability discussed above would also apply to this crossing. Therefore, commencing this HDD in 2020 is required to prudently manage risk to the Project In-Service Date. |

| Start KP - End KP ¹ (PPBoR Sheet Reference) | Area Description | Priority Works Scope of Work | Required Lead Time ² (Months) | Scheduled Start Date ³ | Restrictive Work Window (where applicable) | Land Ownership | Rationale for Designation as Priority Area Works |
|---|---|--|---|-----------------------------------|---|------------------------------|---|
| 1168.300 1169.370 (Segment 7.4 - Sheet 2 and 3) | City of Coquitlam, South side of Mary Hill Bypass to West of Leeder Ave | - 1.07 km of pipeline installation - 3 Auger Bore crossings - Rogers Ave detour installation | 2 | July 2020 | Dry Season preferred | Public and Private | This section of the route involves construction through a historic landfill area with high groundwater levels and suspected contamination. If contamination is encountered, pipeline construction activities may need to be suspended until the contamination is remediated, which could cause significant delays. Specifically, high groundwater could complicate remediation efforts and have an impact on productivity and consequentially have an impact on the schedule. Moreover, construction during the dry season (July - September) is preferred so that work can occur when the groundwater table is lowest. Construction beginning in July 2020 is required to properly manage these requirements and risks to the Project In-Service Date. |
| 1170.470 1171.900 (Segment 7.5 and Segment 7.6 Sheet 1) | City of Coquitlam, ICBC Parking Lot to just east of King Edward St | - 1.43 km of pipeline installation - One Auger bore crossing of United Blvd - Installation of United Blvd Detour - Removal of landfill material and remediation of landfill cap | 2 | August 2020 | Dry Season preferred | Public and Private | This section of the route involves construction through a historic landfill area with high groundwater levels and suspected contamination. If contamination is encountered, pipeline construction activities may need to be suspended until the contamination is remediated, which could cause significant delays. Specifically, high groundwater could complicate remediation efforts and have an impact on productivity and consequentially have an impact on the schedule. Moreover, construction during the dry season (July - September) is preferred so that work can occur when the groundwater table is lowest. Construction beginning in July 2020 is required to properly manage these requirements and risks to the Project In-Service Date. |
| 1174.950 - 1176.000 (Segment 7.7 Sheet 1) | City of Burnaby, West side of BNSF railway at North Rd | - Access and tree clearing required to clear riparian | 1 | August 2020 | Least Risk Fish Window August 1 - September 15 | BNSF Lands, Access from City | Work beginning in August 2020 is required due to the length of forested area with a fish-bearing creek crossing present. This section of the route, which includes tree clearing within |

| Start KP - End KP ¹ (PPBoR Sheet Reference) | Area Description | Priority Works Scope of Work | Required Lead Time ² (Months) | Scheduled Start Date ³ | Restrictive Work Window (where applicable) | Land Ownership | Rationale for Designation as Priority Area Works |
|---|--|--|---|-----------------------------------|--|----------------|--|
| | to North side of MOTI Highway 1 bridge over BNSF railway | vegetation around Holmes and Austin Creek. | | | | and MOTI Lands | riparian areas, requires two least risk “fish window” periods (i.e., 2020 and 2021) to complete in time for a December 2022 In Service Date. |
| 1179.950 1180.022 Segment 7.7 Sheet 4 | City of Burnaby, Inside Burnaby Terminal fence | 70m of pipeline installation within Burnaby Terminal Fenceline | 2 | December 2020 | | TMEP Lands | This construction area is located within Trans Mountain property at Burnaby Terminal. Work at Burnaby Terminal on other TMEP-related construction activities is well underway. The work related to this relatively small segment of Spread 7 is scheduled to commence in 2020 to ensure coordination with those other Burnaby Terminal construction activities and to minimize overall construction time (and impacts) to the surrounding community. If this work is substantially delayed, overall impacts associated with construction at Burnaby Terminal may be prolonged. |

18. Should work in the Spread 7 Priority Areas be materially delayed, Trans Mountain will incur significant costs. Based on monthly expenditures for staff, equipment, storage and laydown yard leases, security, and related construction costs, each month of delay to construction in Spread 7 would add approximately \$3 million CAD to the Spread 7 construction costs.

III. Increased Capital Costs from Delay

19. The Coquihalla Summit Area and Spread 7 are critical components of the overall Project. If construction in these areas is delayed by several months while other components of the Project are complete, the combined effects of extra costs associated with construction caused by the delay and associated financing costs (the allowance for funds used during construction or “AFUDC”) are likely to be several hundred million dollars.

SWORN BEFORE ME at)
Calgary, Alberta,)
this XX day of May, 2020)
)
)
[NOTARIZED COPY TO FOLLOW])
)
_____)
A Commissioner for Oaths in and for Alberta

Signed May 11, 2020



David Safari