Trans Mountain:
Delays into 2023 will add millions to public cost

September 2021 | By Eugene Kung, Staff Lawyer and Jack Jones, Law Student
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Executive Summary

This report compiles and analyzes various Trans Mountain pipeline expansion (“TMX”) documents, including regulatory filings, sworn affidavits and Trans Mountain’s own website to estimate and project the current state of delays to construction and their potential cost implications. Unfortunately, reliable, up-to-date construction cost estimates have not been provided by Trans Mountain in over 18 months (since February 2020) when the cost of the project jumped to $12.6 billion.

We find evidence of delays in each of the seven segments (or spreads) of the project, ranging from two to 23 months. These delays have a cascading effect as much of the work must be sequenced (i.e. right of way clearing must happen before pipeline construction). Construction seasons are impacted by the weather, by fish, bird and animal migration and breeding times, and increasingly, by shutdowns related to forest fires.

Transparency has been a longstanding issue for TMX. Unfortunately, financial updates have been less regular and more opaque since Trans Mountain was purchased by the federal government. Since June 2019, Trans Mountain has only provided detailed scheduling updates in the form of monthly schedules. Trans Mountain must file these schedules to comply with Condition 62 of the 156 conditions imposed by the Canada Energy Regulator (CER, formerly the National Energy Board). Changes in format and broad categorization of the activities in these documents make it difficult to see real progress or delay. In some areas of the project, the filings have shown no changes, just that construction has been ongoing for the past six months, and will continue for the next year.

Without a complete and detailed updated project timeline, there are serious questions about how Trans Mountain is maintaining its proposed in-service date of December 2022, or if it can adapt its construction schedule as numerous critical construction windows continue to be missed.

Future Delays are Inevitable

Comparing the expected timeline for completion of construction activities from Trans Mountain’s 2017 master project plan to its current projected dates, the in-service date of December 2022 looks like a pipedream. This is most readily apparent in a few locations along the pipeline route:

1. The tunnel through Burnaby Mountain, arguably the most complex component of the project, was projected to require two years to build, but construction only started in May 2021. The delay with the tunnel alone now pushes the in-service date past December 2022 and into 2023 (assuming there are no more unforeseen delays).

2. The horizontal directional drilling under the Fraser River, which the master plan projects to take 15 months, is now scheduled to begin in October 2021. The drilling is starting 18 months behind the April 2020 start that Trans Mountain was predicting in February 2020, and according to an affidavit by Trans Mountain VP David Safari, completing this later than September 2022 could delay the entire project by up to 14 months. Comparing the 8-month window given in the Construction Schedule to the previous timeline of 15 months for this activity suggests that the project is currently heading for further delays and an in-service date in 2023.

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3. The Coquihalla Summit, which Trans Mountain has said needed to have construction complete in 2021, is currently projected on the Trans Mountain website to be completing right of way preparation in August 2022. This would add a full construction season to the project for testing and valve installation, which must occur in summer at this elevation. According to Trans Mountain, this delay will likely add 11 months and $50 to $60 million in construction costs alone. Furthermore, in August 2021 the Coquihalla highway was closed and the area evacuated due to the July Mountain wildfire, including the TMX route. It is not clear how much forest fire seasons will shorten the already limited construction season in future years.

Finally, Trans Mountain’s pattern of breaching or asking for relief from project conditions suggests that the only way that Trans Mountain can hope to remain on schedule is by skirting laws, bylaws and conditions meant to mitigate the environmental harm caused by construction. To date, Trans Mountain has asked the CER to be excused (or relieved) from parts of the 157 project conditions over 70 times, with the CER only refusing one request.

West Coast Environmental Law recommends that the next federal government immediately provide an updated, detailed, and transparent cost analysis and revised schedule for the Trans Mountain expansion project, taking into account the climate costs of the increased fossil fuel consumption facilitated by this expansion.
Introduction

The Trans Mountain pipeline expansion project ("TMX") has faced numerous delays since the project was approved then bought by Canada’s federal government in 2018. With an original “in-service” date of 2019, and a revised date of December 2022, it is now obvious that this project is far behind schedule, but the exact extent of these delays is currently obscured to the public in a maze of opaque regulatory documents and lack of clarity from the Crown corporation. Trans Mountain continues to claim the project is “on budget and on schedule”, but this is an easy claim if they keep increasing the budget and extending the timeline. Our analysis shows that construction is delayed into 2023, and possibly beyond, and the cost of construction is likely approaching $20 billion.

The Canadian public has a right to up-to-date details about the cost of delays of the Trans Mountain pipeline expansion project (“TMX”). These details are especially relevant after the federal government claimed that it must maximize revenues from the Trans Mountain project in order to fund a just transition away from fossil fuels. This claim was made in response to the August 9, 2021 report from the United Nations Intergovernmental Panel on Climate Change, which calls for urgent action on the climate crisis and a rapid shift away from fossil fuel development.

Against this backdrop, this report is intended to increase awareness of the delays facing the Trans Mountain expansion project to date. Using publicly available documents such as construction schedules, regulatory filings and affidavits, this report assesses and summarizes the ongoing delays and the increasing costs of this embattled pipeline project. Our analysis demonstrates that the Trans Mountain project is delayed into 2023, and possibly later – well beyond the December 2022 completion date set by the company and its federal owners. Combined with a history of breaching or asking for relief from the conditions that have been placed on the construction on the pipeline, this pattern of delays raises questions about whether Trans Mountain can reach its in-service date, and whether further conditions will be breached in doing so.

Trans Mountain continues to publicly declare that the project is on track and on budget, but its construction schedules tell a different story. According to Trans Mountain’s own construction updates, there have been delays in every segment (or ‘spread’) of the pipeline route, many of which now exceed 16 months.

Given the ongoing construction delays and the rising costs of materials and labour, an updated cost and in-service date should be released and made public to Canadians taxpayers. Such an update should include details about how Trans Mountain plans to address the accumulated delays to date and safely complete the pipeline, while complying with legal requirements.

“On budget and on schedule”

Many Trans Mountain documents no longer refer to Dec. 2022 as the in-service date, but instead use terms like “mechanical completion” for Dec. 2022. This is an important distinction, as Trans Mountain has previously sworn in affidavits that to achieve “in-service” status by this date, all construction
must be complete no later than September 30, 2022, and that delays would result in a loss of earnings of $100 million per month.

For a project with tenuous long-term profitability, in a world trying to transition away from fossil fuels, every delay matters. The federal CER showed in its recent Towards Net-Zero report that further investments in oil production are not essential, and that the Trans Mountain expansion project is not needed, even if Canada does nothing more to increase its climate ambition. To date, several major insurance companies around the world have dropped their coverage of Trans Mountain due to climate concerns. Meanwhile, the International Energy Agency announced that to meet global climate targets there should be no further fossil fuel infrastructure construction and no new oil and gas exploration. This raises stark questions about the economic liability of a publicly-funded oil pipeline intended to expand oil sands production as the world is moving off of oil.

The Rising Cost of Delays

With so many construction delays over the past year, the cost of the pipeline has almost certainly increased. However, the federal government has not provided a cost update since February 2020. In January 2019, the Parliamentary Budget Officer (PBO) found that completing the project one year behind the planned schedule would reduce the value of the Trans Mountain expansion project by $693 million. The PBO also found that a 10% increase in construction costs would lower its value by $453 million.

Every delay since Kinder Morgan’s original application has resulted in increasing costs. When Kinder Morgan first unveiled the project on December 16, 2013, the construction costs were estimated at $5.4 billion and the in-service date was December 2019. Since then, the price tag has increased steadily, reaching $7.4 billion in 2017 – after which Kinder Morgan warned the project could be more than a year behind schedule.

After the federal government purchased the pipeline for $4.5 billion, and committed taxpayer money to complete the project, Kinder Morgan revealed that project construction costs were projected to be $1.9 billion higher than previously expected – bringing the new projected cost to $9.3 billion, and that the project would be delayed an additional full year to December 2021.

In February 2020, Trans Mountain announced that the projected construction costs have soared to $12.6 billion, bringing the total cost of the project to $16 billion – an even greater figure than the federal deficit at the time. Some observers estimate that the cost is now close to $20 billion.

With the backing of the federal government, it may seem that the budget for this project is now unlimited, but the increased costs from delay will not be fully recovered from increased toll revenue, due to the structure of

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the tolling agreement. Construction costs are categorized as ‘capped’ and ‘uncapped’, with an approximate 75%/25% split, meaning only 25% of cost overruns will be fully recovered in toll revenue. As the cost overruns of this pipeline increase, the likelihood of the government finding a private buyer or operating the pipeline on a commercial basis decreases.

Based on monthly expenditures for staff, equipment, storage and laydown yard leases, security, and related construction costs, each month of delay to construction in a given spread of the pipeline could add millions of dollars in costs. For instance, one month of delay in Spread 7 alone would add approximately $3 million to the Spread 7 construction costs. Executive Vice-President for Trans Mountain David Safari stated in his affidavit to the CER that:

“If construction in [the abovementioned priority areas of Spread 7 and the Coquihalla Summit] is delayed by several months... 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.”

To bring Trans Mountain in line with federal norms and expectations around reporting and transparency, the next federal government must immediately provide an updated, detailed, and transparent cost analysis and construction schedule for TMX, taking into account the climate costs of the increased fossil fuel consumption facilitated by this expansion.

Summary of Delays

According to Trans Mountain’s monthly construction schedules, most activities have been delayed, with delays ranging anywhere from one to 23 months. In many spreads, delays already reach more than 16 months and could still become longer than Trans Mountain’s current estimates.

Our analysis divided the common activities listed by Trans Mountain into broader categories:

- **Pipeline construction activities** – “Grub, Strip & Grade”, and “String, Weld, Tie ins”; and
- **Commissioning steps** – “Horizontal Directional Drilling” (HDD), “Hydrostatic testing”, and “Valve Installation”.

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9 Supra note 2, at para 19.
Along the Trans Mountain route, the completion of early site preparation steps to date has generally been delayed six months to a year. This is despite, in some cases, starting early, and in multiple places doing ROW Clearing during what were projected as construction restriction windows. Pipeline construction activities to date are generally delayed more than six months, and up to 15 months. Commissioning steps to date are delayed more than a year in all but two areas of the pipeline (the shortest delays are 9-10 months).

In many segments, extensive delays in projections occurred in the fall/winter of 2020, but overall, the delays occur gradually, increasing one month at a time, often with the end date out of sight on the construction schedule. This makes it hard to judge whether the timeline is shifting more for projections beyond each chart’s reach, and impossible to know the true completion date of the pipeline.

As Trans Mountain’s construction schedules show, since February 2020, there have been extensive delays in the completion of project construction activities in every segment of the project, as outlined in the chart below.

**SUMMARY OF DELAYS – COMPLETION**

![Chart summarizing delays in completion of each stage of construction across the different spreads (segments) of the pipeline route. Based on analysis by West Coast Environmental Law.](image-url)

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A Long History of Delay (up until 2020)

The Trans Mountain expansion project has already been delayed repeatedly since it was first proposed almost 10 years ago. Since the early days of the project, construction activities have consistently been behind schedule due mainly to an array of issues ranging from permit acquisition, to legal challenges, to growing public opposition through direct action. The pipeline was originally planned to be built and fully operational by December 2019, but Trans Mountain reported that it was behind schedule by at least a year in January 2018 after failing to secure municipal permits from the city of Burnaby.

After the federal government announced in May 2018 that it would purchase the pipeline from Kinder Morgan and use public taxpayer money to build the expansion, documents filed by Kinder Morgan revealed that constructions costs were $1.9 billion more than previously projected – bringing the total cost to $9.3 billion – and that the timeline would need to be set back again by a full year to December 2021.

In the fall of 2019, Trans Mountain was ordered by the National Energy Board to complete a new detailed route hearing process along the entire pipeline after the Federal Court of Appeal found that the previous consultations with Indigenous peoples along the route fell "well short of the mark set by the Supreme Court of Canada." This led Trans Mountain to further push the operation date into 2022, while admitting that “the decision has introduced uncertainty into the construction schedule.”

To date, not one segment of the project is completed. Only Segments 1 and 2 have projected completion in sight: September 2021, and May 2022 respectively. Even then, for the short 49-km Segment 1, this would be a year behind its intended completion date. The ongoing delays across the project raise serious doubts for whether any segment of the project is on track to meet its current in-service date of December 2022.

Delays in 2020–2021

Safety Shutdowns and Firing Contractors

On December 16, 2020, a worker was seriously injured at Trans Mountain’s Burnaby tank farm, following a worker death in Edmonton in October, 2020. Soon after, the CER inspected Trans Mountain pipeline expansion project job sites in the Lower Mainland and revealed “systemic non-compliance” with COVID-19 protocols. Among other things, the CER inspector required that Trans Mountain carry out a mandatory safety stand down applying to all worksites in the Lower Mainland region. Trans Mountain subsequently extended the shutdown to the entire construction project for over seven weeks.

Around the time of the shutdown, Trans Mountain fired Macro Spiecapag Joint Venture (Macro) from Segment 5B and SA Energy from Segments 1 and 4B. Macro’s termination was “for cause”, but they were subsequently rehired on an interim basis after a two-month gap, in February 2021. On May 21, Kiewit Bonatti TM EP Partnership was announced as the new general contractor for Segment 5B. A recent Kiewit job posting advertised the project taking three years to complete. After a 3.5 month gap, on April 1, Trans Mountain hired Midwest Pipeline to complete Segment 1, and hired Ledcor Sicim Limited Partnership to complete limited

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work on Segment 4B until a general contractor is chosen (something the Trans Mountain website currently shows as “to be confirmed”).

According to a June 16, 2021 report submitted by Trans Mountain to the CER, the company is experiencing significant challenges in securing qualified candidates for several positions that require a Class 5 license due to a several month backlog for testing and certifying workers. Trans Mountain has not identified potential solutions to this delay.

**Hummingbird Stop-work Order**

In April 2021, Trans Mountain was ordered to stop work along part of the route for four months after Environment and Climate Change Canada enforcement officials caught subcontractors cutting trees in active nesting areas of protected migratory birds – most notably Anna’s hummingbirds in Burnaby (Segment 7). This order was in effect until August 20, 2021.

According to Trans Mountain’s own affidavit to the CER, tree clearing in that area needed to be completed by August 1st, 2021 in order to stay on schedule to complete watercourse crossing within the determined 2021 window. Failure to do so would not only put this portion of work behind schedule, but cause additional delays in scheduled hydro-testing in 2022, and ultimately its 2022 in-service date. The latest construction schedule projects that the right of way preparation here is delayed into March 2022 (roughly eight months behind when Trans Mountain said it needed to be complete in order to reach the 2022 in-service date). This could mean that the entire project completion is pushed back due to this delay alone.

**Tree Clearing Stop-work Order**

After Trans Mountain’s failure to complete the necessary environmental compliance work required for subcontracted clearing activities, the CER issued a stop-work order that restricted tree clearing and mowing activities across the entire project. The stop-work order was issued due to a contravention of the general duty to reasonably care for the environment, and in contravention of environmental protection certificates. The stop-work order was in place from June 3 to June 22, 2021.

Affidavits from Trans Mountain’s VP, David Safari, show that delays in tree clearing activities mean that the work must be rescheduled to the following construction season, delaying construction by as much as 11 months, and increasing the project budget by $50-60 million in areas that would require a third construction season.

Not all construction activities in all segments are possible year-round, increasing the likelihood that the project’s completion and in-service date will be pushed into the following calendar year. In many of the segments, this would mean as much as a further six-month delay due to rainfall and inclement weather conditions. Right of way preparation, including tree clearing, at the Coquihalla Summit is currently scheduled to complete in August 2022, according to the Trans Mountain website. This would add a third construction season.

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14 Supra note 2
season, and we do not yet know how much this timeline will be further delayed by the out-of-control July Mountain Wildfire, which caused the closure of the Coquihalla highway and evacuation of the area.

In other areas along the route, tree clearing was already delayed before the CER stop-work order. One area in Burnaby, where tree clearing was scheduled to begin in August 2020, did not begin until April 2021. This work was required to happen at that time in 2020 because this area requires two least risk “fish window” periods (i.e., 2020 and 2021) to complete in time for a December 2022 in-service date. Since Trans Mountain failed to complete its necessary work in 2020, the company will likely have to complete the crossing in 2022, which will stretch the timeline for the subsequent hydrostatic testing well into 2023.

Burnaby Tunnel Delays

According to Trans Mountain’s master scheduling plan,\(^6\) construction of the Burnaby tunnel will take a minimum of 20 months as long as there are no unforeseen delays. Construction on the tunnel began in May 2021, suggesting a delay into 2023, after backfilling and testing. In an attempt to make up for the delays, Trans Mountain announced that it would operate the tunnel boring machine 24 hours a day, 7 days a week for about 300 days.

Fraser River Drilling

The horizontal directional drilling under the Fraser River is now scheduled to begin in October 2021. This is already 18 months behind the April 2020 start that Trans Mountain was predicting in February 2020, and according to an affidavit by Trans Mountain VP David Safari,\(^7\) completing this later than September 2022 could delay the entire project 14 months.

Despite the fact that Trans Mountain’s August Construction Schedule says that this will be complete by May 2022, comparing this eight-month window to the previous timeline in their master plan of 15 months for this activity suggests that the project is currently heading for further delays and an in-service date in 2023. The Trans Mountain website currently still says that this activity will take 14 months, but shows it starting in February 2021 and going until April 2022. The same timeline starting in October (as now projected in the construction schedules) would delay hydro-testing into 2023.

A failed attempt at a similar drilling site under the Thompson River in Kamloops resulted in 904m of abandoned pipe, after which Trans Mountain re-rerouted and completed the drilling a month later. To do this within their timeline, Trans Mountain ignored the legal requirement to gain pre-approval for route alterations.


\(^7\) Supra note 2, para 16.
Instead, they asked the CER for relief from their violation of this requirement six months after completing the alteration. The CER begrudgingly granted the relief in July 2021, writing:

“The Commission notes that Trans Mountain did not obtain approval of, or deposit, the revised PPBoR prior to construction, as required by paragraphs 198(c) and (d) of the CER Act. Nor did Trans Mountain consult with two (the City and BCOGC) of the three landowners impacted by the deviation prior to construction.” [...] 

“The Commission does not accept Trans Mountain’s rationale” [...] 

“The Commission takes breaches of its requirements seriously” [...] and finally 

“...the Commission grants Trans Mountain’s request.” 18

This raises concerns that if there were a failed drilling attempt under the Fraser River, Trans Mountain may continue to ignore the CER requirements in order to meet their in-service date, then subsequently ask for forgiveness. Combined with Trans Mountain’s poor record on workplace safety, this is serious cause for alarm. Asking the CER for forgiveness instead of permission is a concerning development, especially given that Trans Mountain has already asked the CER (and NEB before them) to excuse (or relieve) them from parts of the 156 project conditions well over 70 times, with only one instance of the CER denying the request for relief.19

**No Final Route**

As of July 26, 2021, after route hearings in the Coldwater River Valley, an alternative route through this area was approved. The detour adds $20 million to construction costs, according to Trans Mountain. Construction is expected to take 11 months. Any delay to start of construction or during construction would threaten the in-service date of December 31, 2022.

During summer 2021, the wildfire season resulted in evacuation orders along the pipeline route, including the July Mountain Wildfire, which was discovered July 13, 2021 west of Highway 5, about 45 km southwest of Merritt. On August 5, 2021, the fire expanded and jumped over the Coquihalla Highway and the entire area was evacuated.

A further 1.2 km of the route is also not approved near the Sumas Terminal in Abbotsford, and the route hearing was held in abeyance until July 30, 2021 while the landowner and Trans Mountain investigate mitigations to address the landowner’s concerns. The results of this route hearing or the mitigations needed are likely to add costs and delay construction further.

**Permitting Delays**

Section 35 of the federal *Fisheries Act* is intended to mitigate harm to fish from construction or undertakings that would cause harmful disruption or destruction of fish habitat. The Trans Mountain pipeline received

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authorization for its activities – proposed to cross over 1,500 rivers, streams and creeks along the route – in December 2020, but was required to submit additional information to the CER in May 2021. Trans Mountain’s response to the CER indicates that there are significant “harm to fish” matters to be resolved. Meanwhile, the BC Oil and Gas Commission has refused 43 watercourse crossing applications under the provincial Water Sustainability Act as of March 2021.

In March 2021, Trans Mountain updated its watercourse crossing inventory to include an additional 426 streams and channels, 14 of which the company identified as fish-bearing. The BC Oil and Gas Commission will need to review construction methods and timing for each of these new waterways and grant permits for changes in and about a stream, leading to potentially significant delays to construction. In May, 2021 Trans Mountain filed a response to the CER indicating they need new authorizations under the Fisheries Act and their construction timing must be delayed until winter on at least two of these crossings.

**Segment 6 Inactivity**

According to Trans Mountain’s construction schedules, segment 6, including the communities of Sumas and Chilliwack, has experienced significant delays. To date, the only work documented in segment 6 is “pre-construction activities” undertaken from June to October 2020. According to communications between Trans Mountain senior executives and a landowner along the route, the delays in this large section are largely due to an extended inability to secure a contractor for this segment. After the systemic safety failures described earlier, the general contractors for four segments were fired. Contractors in the other segments were only replaced in April.

**Trans Mountain Construction Website**

The Trans Mountain website has a page describing construction activities for the public. The timelines on this website vary from those that they have filed in their construction schedules with the CER. These variances show up to 10 months of additional delays in some areas, including in the key construction areas, where windows for construction are restricted by weather and the risk to fish, such as the Fraser Valley, Lower Mainland, and Coquihalla Summit. If these website timelines (issued by Trans Mountain) are correct, according to affidavits from senior Trans Mountain executives, the pipeline in-service date will be delayed by an

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additional construction season on the Coquihalla Summit till fall 2023 and cost an additional $50-60 million just in construction costs.

The Trans Mountain website currently shows construction on the Westridge Marine Terminal extending into March 2023. This alone is an indication that a 2022 in-service date has now been abandoned by Trans Mountain.

In some areas, the Trans Mountain website shows the construction timeline being earlier than in schedules filed with the CER. Whichever projection is accurate, if indeed either one is, the actual construction timeline is not straightforward and does not meet the expectation of transparency for a major federally owned infrastructure project. It is time for Trans Mountain and the next federal government to increase the transparency and accountability around the costs and delays of this project.

![Screenshot from Trans Mountain website showing construction schedule for Westridge Marine Terminal. (Accessed August 2021)](image-url)
In Trans Mountain’s Own Words

In a media statement on May 27, 2021, Trans Mountain stated that the project is on budget and on schedule, despite evidence that the budget is increasing and the timeline is expanding. In legal affidavits submitted by Trans Mountain to the CER, Director of Land for Trans Mountain Alain Parise stated that:

“each month of delay to the Project in-service date results in lost earnings of approximately 100 million dollars and millions of dollars in excess capital costs”. 26

These estimates are originally attributed to Executive Vice President David Safari, by President and CEO for Trans Mountain, Ian Anderson, in his May 2020 affidavit.27 Trans Mountain has continually stated this as a point of urgency when seeking relief from environmental and other regulations, while continuing to maintain publicly that the project is on budget.

Similarly, Executive Vice-President for Trans Mountain David Safari has continually argued in an affidavit to the CER, that any delays in construction would have significant impacts on the in-service date28 when seeking to avoid regulatory and permitting requirements. A side-by-side comparison of Safari’s stated construction requirements in order to achieve the planned in-service date, and Trans Mountain construction schedules reveal a gross discrepancy with serious implications for the projected in-service date. Despite these obvious inconsistencies, Trans Mountain continues to maintain that the project can meet its in-service date.

In Conclusion

This report summarized and analyzed Trans Mountain’s publicly available documents to conclude that the project is delayed and over budget. This means that Trans Mountain will be unable to meet its scheduled completion and in-service date for the pipeline, and the ongoing construction delays mean the cost of the project is much higher than $12.6 billion announced by the federal government more than 18 months ago. The Parliamentary Budget Officer found last year that any delays or increased costs would give the project a negative net present value. Since that finding, there have been consistent delays in the pipeline’s construction.

It is time for the next federal government to update Canadian taxpayers and possible private buyers on the real cost of the pipeline project and its much longer construction timeline. The public has a right to transparency in how this project is completed, including every delay, every increased cost, and every breached regulation.

26 Supra note 13 at para 58.
27 Supra note 3.
28 Supra note 2.
## Appendix 1

### SUMMARY OF DELAYS – COMPLETION

<table>
<thead>
<tr>
<th>SPREAD</th>
<th>PHASES</th>
<th>NUMBER OF MONTHS DELAYED</th>
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<tbody>
<tr>
<td>1 EDMONTON</td>
<td>PREPARATION</td>
<td>5-6 MONTHS</td>
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<td></td>
<td>CONSTRUCTION</td>
<td>5-13+ MONTHS</td>
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<tr>
<td></td>
<td>CROSSINGS &amp; TESTING</td>
<td>3-12+ MONTHS</td>
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<td>2 ALBERTA FOOTHILLS</td>
<td>PREPARATION</td>
<td>10-12+ MONTHS</td>
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<tr>
<td></td>
<td>CONSTRUCTION</td>
<td>10-13+ MONTHS</td>
</tr>
<tr>
<td></td>
<td>CROSSINGS &amp; TESTING</td>
<td>0-8+ MONTHS</td>
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<tr>
<td>3 &amp; 4A WESTERN ROCKIES</td>
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<td>5-11 MONTHS</td>
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<td></td>
<td>CONSTRUCTION</td>
<td>0-3 MONTHS</td>
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<td>CROSSINGS &amp; TESTING</td>
<td>4-5 MONTHS</td>
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<td>CROSSINGS &amp; TESTING</td>
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<td>CROSSINGS &amp; TESTING</td>
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<tr>
<td>10 QUESNEL</td>
<td>PREPARATION</td>
<td>16+ MONTHS</td>
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### Appendix 2

**SPREAD 1: Edmonton**

<table>
<thead>
<tr>
<th>Task</th>
<th>Initial Projected Start</th>
<th>Initial Projected Completion</th>
<th>Actual Start</th>
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<th>Notes</th>
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<tr>
<td>Surveying</td>
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</tr>
<tr>
<td>Right of Way Clearing</td>
<td>1 MONTH DELAY</td>
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<tr>
<td>Grub, Strip &amp; Grade</td>
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<tr>
<td>String, Weld, Tie-Ins</td>
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<td>13+ MONTH DELAY</td>
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<tr>
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<td>Valve Installation</td>
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**Timeframe:**
- **2020:** Jan - Dec
- **2021:** Jan - Dec
- **2022:** Jan - Dec
SPREAD 2: Alberta Foothills

LEGEND

• INITIAL PROJECTED START
• INITIAL PROJECTED COMPLETION
▼ ACTUAL START
★ ACTUAL COMPLETION
♀ UNKNOWN START / COMPLETION

<table>
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<tr>
<th>Activity</th>
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<td>Yard, Hydrovac, &amp; Access</td>
<td>1+ YEAR DELAY</td>
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<td>16+ MONTH DELAY</td>
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<td>13+ MONTH DELAY</td>
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<tr>
<td>HDD</td>
<td>UNKNOWN DELAY</td>
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<tr>
<td>Hydrostatic Testing &amp; Valve Installation</td>
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<td>9+ MONTHS DELAY</td>
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Timeline:
- January 2020 to January 2021
- April 2021 to July 2021
- October 2021 to January 2022
- April 2022 to July 2022
- October 2022
SPREAD 7: Lower Mainland and Fraser Crossing

LEGEND

- INITIAL PROJECTED START
- INITIAL PROJECTED COMPLETION
- ACTUAL START
- ACTUAL COMPLETION
- UNKNOWN START / COMPLETION

- RIGHT OF WAY CLEARING
- HDD
- WATERCOURSE CROSSINGS ACCESS PREP
- PIPELINE CONSTRUCTION

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<th>YEAR</th>
<th>TASK</th>
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<th>COMPLETION</th>
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<td>HDD</td>
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<td>2022</td>
<td>PIPELINE CONSTRUCTION</td>
<td>?</td>
<td>7+ MONTH DELAY</td>
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SPREAD: Tunnel

PORTAL 1 DEVELOPMENT

PORTAL 2 DEVELOPMENT

TBM TUNNELING

LEGEND

 INITIAL PROJECTED START  INITIAL PROJECTED COMPLETION
 ACTUAL START  ACTUAL COMPLETION
 UNKNOWN START / COMPLETION

JAN 2020

2021

JUL

APR

OCT

JAN

2022

JUL

APR

OCT

JAN

2

5

6 MONTH DELAY

13+ MONTH DELAY

8+ MONTH DELAY
SPREAD: Facilities

LEGEND
- INITIAL PROJECTED START
- INITIAL PROJECTED COMPLETION
- ACTUAL START
- ACTUAL COMPLETION
- UNKNOWN START / COMPLETION

EDMONTON TERMINAL
- 2 MONTH DELAY

ALBERTA PUMP STATION: EDMONTON
- 5+ MONTH DELAY

ALBERTA PUMP STATION: JASPER
- ON TIME

BC PUMP STATION: DARFIELD
- 1+ MONTH DELAY

BC PUMP STATION: KINGSVALE
- ON TIME

BC PUMP STATION: HARGREAVES
- ON TIME

BC PUMP STATION: HOPE
- ON TIME

WESTRIDGE MARINE TERMINAL
- 4 MONTH DELAY