Proposed Pipelines and Tanker Spill Risk for BC

May 6, 2012

Table of Contents

Summary	Page 3
1. Northern Gateway	Page 4
2. Kinder Morgan	Page 9
3. Conclusions	Page 11

Tables:

1.	Northern Gateway Pipeline Expansion Plans	Page 4
2.	Kinder Morgan Existing Trans Mountain Pipeline	Page 10

Summary

The proposed Northern Gateway pipeline and marine terminal project has been presented as a crude oil pipeline with a 525,000 barrel per day capacity throughput and a condensate pipeline with a 193,000 barrel per day capacity throughput. Enbridge estimates that this will trigger the need for 220 crude oil tankers transiting the Douglas Channel on an annual basis.

Detailed plans filed with the National Energy Board Joint Review Panel reveal that the capacity of the pipelines are well in excess of those being considered under the mandatory environmental assessment process. As a result, the actual risk this project poses to BC's environment—both inland and marine—is not adequately being addressed under the current review. The tanker traffic triggered from the design capacity, based on Enbridge's figures, would likely see upwards of 340 oil tankers a year transiting the Douglas Channel.

In order to expand throughput capacity, Enbridge has stated that additional pump stations and pump units would be required. Enbridge would need to file a request for approval with the National Energy Board to expand capacity. However, no environmental assessment of the impact of this expanded capacity is required, nor is an environmental impact and risk assessment of the tanker traffic it triggers.

This means that an evaluation of environmental risk which adequately informs the BC public of its exposure to pipeline and tanker oil spills, is not being appropriately defined or undertaken during the current Joint Review Panel process—nor is it likely to be done in the future.

The proposed Kinder Morgan pipeline to Burnaby would expand capacity to 850,000 barrels per day from the current 300,000 barrels per day by constructing a twin pipeline along the company's existing pipeline route. All crude oil shipped along the new pipeline would be destined for marine export. Kinder Morgan has stated that the anticipated tanker traffic related to these exports would increase annual volume from 71 oil tankers in 2010, to a tanker a day transiting Burrard Inlet.

It is possible Kinder Morgan's design plans, once submitted for review to the National Energy Board, would also allow for capacity expansion of throughput with increased pumping power.

Should this be the case, taken together, Northern Gateway and Kinder Morgan could represent 2 million barrels per day of crude oil transported through BC and as many as 800 crude oil tankers a year transiting BC coastal waters.

Proposed Pipelines and Tanker Spill Risk for BC

Two major inter-provincial oil pipeline proposals are being advanced to transport crude oil from Alberta across British Columbia to coastal ports for shipment to Asia. These are the Enbridge Northern Gateway project and the Kinder Morgan Trans Mountain pipeline.

1. Northern Gateway

The Enbridge Northern Gateway Pipeline Project consists of two pipelines and a marine terminal. One pipeline will export crude oil, while the other will import condensate. Condensate is needed to dilute bitumen, a heavy crude, which is too dense to flow through an oil pipeline unassisted.

The pipelines would be built from Alberta across Northern British Columbia to the project's marine terminal in Kitimat. The crude oil is destined for China and other Asian markets. It has not yet been identified by Enbridge where the condensate will be sourced.

Enbridge estimates it will take 220 tankers annually to ship the crude oil and condensate aboard three tanker classes—Aframax, Suezmax and Very Large Crude Carriers—VLCC.[1]

What has not been widely reported, and lies buried in the thousands of pages of information requests and evidence filed with the National Energy Board (NEB), is Enbridge's Northern Gateway pipeline is designed to expand from the initial capacity of 525,000 barrels per day to 850,000 barrels per day—a 60 percent increase in capacity. The condensate pipeline is designed to expand from 193,000 barrels per day to 274,000 barrels per day—a 40 percent increase in capacity. All that is required for this expansion, once the pipelines are built, is the addition of pump stations and pump units.

The details of Enbridge's planned expansion are provided in response to a question raised last year by the Joint review Panel (JRP). The panel requested that Enbridge provide "A detailed description of the potential expansion scenarios which could be possible by adding additional pump stations and pumping facilities, including corresponding capacities."[2]

On August 30, 2011 Enbridge responded by providing its detailed expansion plans. A summary is provided below.

Northern Gateway Pipeline Expansion Plans

Table 1

	Phase I	Phase II	Phase III	Phase IV
Crude Oil	525 kbpd	600 kbpd	750 kbpd	850 kbpd
Condensate	193 kbpd	250 kbpd	275 kbpd	n/a

Source: NGP response to JRP IR No.3 page 8-9.

1 https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/691974/B23-15_-_TERMPOL_Surveys_and_Studies_-_Section_3.15_-_General_Risk_Analysis_and_Intended_Methods_of_Reducing_Risk_A1Z6J9_?nodeid=692005&vernum=0&redirect=3 page 4-4. The 220 is made up of 50 Aframax, 120 Suezmax, and 50 VLCC.

2 NGP Response to JPR IR No.3 page 5

The company explained in its response to the JRP that "(t)he target annual capacities in 100% diluted bitumen service for the oil pipeline system range from an initial of 525 kbpd annual, to an ultimate expansion capacity of up to 850 kbpd annual. The target capacities for the condensate pipeline system range from an initial capacity of 193 kbdp annual, to an ultimate expansion capacity of up to 275 kpbd annual"[3]

The company also stated it understood that the expansion plans were not part of the applied for Project and that they have developed their plans to assist in system design and pipe wall thickness selection. "Any future expansion scenarios and associated facilities beyond the applied for Project would be the subject of future regulatory applications and would include the required justification and technical and other studies."[4]

There are no mandatory environmental assessment processes or hearings for additional pump stations and pumps which increase the total throughput capacity of a pipeline. If Northern Gateway proceeds, it is very unlikely the spill risk associated with its expanded capacity—for both inland pipeline events and associated tanker traffic—will be adequately assessed. The NEB, under Part III, Section 58 of the *National Energy Board Act*, has the authority to exempt pump stations and pumps.

> ***58.****(1) The Board may make orders exempting*
>
> *(a) pipelines or branches of or extensions to pipelines, not exceeding in any case forty kilometres in length, and*
>
> *(b)any tanks, reservoirs, storage facilities, pumps, racks, compressors, loading facilities, interstation systems of communication by telephone, telegraph or radio, and real and personal property, or immovable and movable, and works connected to them, that the Board considers proper.*

In its public documents, the NEB explains that "Generally, hearings are not required for projects less than 40 kilometres in length, or for additions to existing systems."[5]

If the NEB deems it necessary they can hold a hearing, but there is no requirement to do so, nor is their a requirement to examine the environmental risk associated with greater throughput pressure in the pipeline or increased tanker traffic density because there is an increased volume of crude to be shipped.

The frequency and severity of a potential spill increases—at an increasing rate—with greater throughput and traffic density. It is a fundamental feature of insurable risk underwriting that risk is non-linear with respect to volume throughput of a system, such as a pipeline. It is also a fundamental feature of insurable risk underwriting that risk increases in a non-linear fashion with respect to traffic density such as increased tanker traffic.

Enbridge's various environmental risk analyses submitted to the NEB have all been undertaken using crude oil flow volumes and oil tanker traffic density well below what is planned. Without a proper

3 Ibid., page 7 - 8
4 Ibid., page 8 - 9
5 A proposed Pipeline or Power Line Project, What You Need to Know, NEB, page 2. ME23-121/2011 E

scope of risk assessment, the NEB is not able to conduct due consideration of the environmental risk Northern Gateway presents to BC, and therefore it cannot fulfill its responsibility to adequately address the public interest.

With its Phase I, minimum capacity, plans, Enbridge estimates 220 tankers per year transiting the Douglas Channel to Kitimat marine terminal—141 for crude oil shipment and 79 for condensate.[6] The maximum expanded capacity would see about 340 tankers—240 for crude oil shipment and 100 for condensate.

There is no reason to believe that the true environmental risk represented by the Northern Gateway Project is being—or ever will be—adequately addressed. The current JRP process has excluded a significant portion of the project's actual capacity and its implications for pipeline spill and marine spill, while in the future, there is no statutory obligation to do so. All indications from the Federal government suggests there will be no political will either. Specifically,

1. the designed and planned capacity of the pipelines represents a significant increase in the throughput of the system over what has been presented, while Enbridge's pipeline spill risk analysis submitted to the JRP has been conducted assuming a minimum level of throughput;

2. tanker traffic triggered by increased crude oil throughput is significant and poses an increasing, non-linear risk exposure of BC coastal waters to oil tanker spill. None of this additional tanker spill risk is included in Enbridge's marine spill risk analysis submitted to the JRP;

3. given the NEB's past practice respecting pipeline capacity expansion on existing pipelines[7], as well as its legislative ability to waive a review of capacity expansion for existing pipelines, there is no reason to believe appropriate risk assessment will be undertaken at anytime in the future and hence the only certain method of doing so would be under the current JRP process; and

4. the Federal government has taken legislative steps to dominate the environmental review process, expedite review and exclude public input. Demonization of legitimate environmental concern does not auger well for future discretionary environmental assessment.

The pipeline and marine spill environmental risk posed by the entire range of pipeline capacity throughput—and the tanker traffic it triggers—should be included in the current scope of the NEB risk assessment.

The province of BC—which has been a passive observer of the NEB JRP process—needs to be aware an approval of the Northern Gateway pipeline effectively represents a capacity of 850,000 barrels per day and upwards of 340 tankers a year transiting the Douglas Channel.

The risk exposure of BC's and First Nations' lands, fresh water rivers, and marine ecosystems has been presented as “low” by Enbridge. Volume 7B of Enbridge's application assesses pipeline spill risk. The proponent based its conclusion on its history of oil spills and a consultant's report. “Given these records (Enbridge's spill statistics from 2005 – 2009) and the return periods, the likelihood of a medium

6 Termpol 3.15., op cit., page 4-4.

7 Discussed in greater deal in the Kinder Morgan section of this paper.

to large spill is considered low."[8] This is misleading.

Not only are the conclusions based on a minimum exposure to crude oil throughput, the consultant's report is based on the likelihood of a spill at a point on the pipeline when it is more appropriate to evaluate the risk across the pipeline system—or aggregate risk. As a result Enbridge has underestimated pipeline spill risk by as much as 10 times.[9]

More importantly, Enbridge based its conclusion on the company's history of spills from 2005 to 2009, while two months after filing its risk assessment, Enbridge experienced the largest inland crude oil pipeline spill in North American history. On July 26, 2010, Line 6B erupted spilling almost 25,000 barrels of bitumen into the Kalamazoo River in Marshall, Michigan. Almost two years later clean-up continues and costs have reached a reported $765 million. The spill is far from being remediated.

This is the first time the US Environmental Protection Agency has had a diluted bitumen spill of this size and responders are "writing the book" on how to respond.[10] To date, only 3 of the 39 miles of affected river have been re-opened for public use.

A spill event of this magnitude has not inspired Enbridge to adjust its risk estimates to reflect its recent history. Neither does it appear it has been requested to do so by the JRP. However, the private insurance market has adjusted its attitude regarding the spill risk Enbridge represents. The company was unable to obtain the level of coverage it desired at an affordable premium for the insurance year following the spill.[11]

The pipeline spill environmental risk assessment reports, filed by the proponent, have not only under-represented the scope of the project, they suffer from inherent analytical and methodological weaknesses that further minimizes the likelihood of a spill event and under-represents risk. Analytical and methodological weaknesses also exist in the marine spill analysis submitted by the proponent.

A number of intervenors have submitted expert evidence addressing the short-comings in Enbridge's pipeline and marine risk analysis and response plans.[12] This evidence will be reviewed by the JRP. A discovery by the panel that Enbridge's risk assessment under-represents exposure, however, will not address the problem inherent in the broader reality that the scope of the assessment is deficient.

---

8 https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/620129/B3-20_-_Vol_7B_%E2%80%93_Gateway_Application_%E2%80%93_Risk_Assessment_and_Mgmt_of_Spills_-_Pipelines_(Part_1_of_2)_-_A1T0H0_.pdf?nodeid=620089&vernum=0&redirect=3 page 3-3, May 10, 2010.

9 See Limitations of Code-Based Seismic Design, Malhotra, Praveen, December 2011, submitted by Haisla First Nation. This analysis focuses on Earthquake risk, but the conclusions relate to all perils and illustrates that the lack of an aggregate risk assessment fundamentally understates exposure by as much as 10 times.

10 Kalamazoo Gazette, July 24, 2011.

11 An Economic Assessment of Northern Gateway, Robyn Allan, January 2012, pages 33 - 40.

12 Enbridge has submitted a number of studies including Termpol Study No. 3.15 addressing marine risk, Volume 7B of the Application, Risk Assessment and Management of Spills-Pipelines. The Haisla Nation has addressed a number of issues in evidence including Limitations of Code-Based Seismic Design, Raveen K. Malhotra, December 15, 2011, Preliminary Analysis and Observations regarding Enbridge Northern Gateway Project Proposal Documents – Oil Spill Contingency Planning, Nuka Research, and Ecological Costs of the Proposed Northern Gateway Pipeline, Ruth and Gasper, December 2011. The Raincoast Conservation Foundations written evidence submission December 21, 2011. The Coastal First Nations have addressed risk assessment and highlighted deficiencies in Report on CFN Impacts, January 2012. The Alberta Federation of Labour has raised issues related to under-insured risk for pipeline related oil spills in An Economic Assessment of Northern Gateway, Robyn Allan, January 2012.

The purpose of this report is to identify the need for a complete new approach in the scope of the risk assessment submitted by the proponent within the framework of the existing JRP process. Obviously if the scope of the environmental review is expanded to reflect intended risk, it is hoped the proponent will take note of the expert reports already filed, and undertake a more appropriate measurement of the intended risk of its project—both in terms of scope and methodology. However, given the experience regarding the practices and procedures of the JRP to date, and the Federal government's recent steps to undermine the integrity of the process even further, it is unlikely due consideration to this issue will be forthcoming.

The Gitga'at First Nation, in a letter written January 16, 2012 to the Canadian Environmental Assessment Agency (CEAA), and copied to the NEB, expressed concern regarding the scope of the JRP process and the lack of identification, by the proponent, to indicate the "the changes in tanker shipping required to accommodate full pipeline capacity nor have we seen,via qualitative risk or cumulative impact assessment methods, analysis of the risks and impacts associated with use of the full capacity."[13] The letter was addressed to the CEAA because it is the body that has responsibility for consultation with First Nations affected by Northern Gateway. It was submitted as a comment letter to the JRP on March 23, 2012.

It is unclear how, by deflecting responsibility and accountability for important issues of environmental risk and full review, that this issue will be adequately addressed. Given recent attempts to undermine environmental due process and consideration by the Federal government, the reasonable expectations of participants in the JRP process have been violated. The province of British Columbia, with its passive approach to the Northern Gateway project, and the Premier's unwillingness to take a direct interest or position on the project, further exposes BC residents—not only to environmental spill risk, but risk to its sovereign right to decide the future of the project.

In June 2010, the province of BC signed away its right to parallel environmental review and reasonable expectation for final say on issuing a certificate. This agreement was signed with the belief that the NEB JRP process would be an arms length, quasi-judicial review, protecting the public interest of British Columbians.

The recent introduction of legislation by the Federal government along with its public statements that Northern Gateway must proceed, have fundamentally altered the rules and put BC's sovereign right at undue risk. The Premier needs to give notice that BC is taking back its right for due process and scrutiny of the NEB JRP as allowed under the 2010 Equivalency Agreement. To date, she has failed to do so.[14]

The design plans submitted by the proponent for Northern Gateway represents a substantive increase in crude oil and condensate throughput and a substantive increase in tanker traffic through the Douglas Channel than is being assessed by the JRP. This situation needs to be addressed and rectified if BC residents are to have the information they need regarding the risks of the project they will bear for the benefit of Alberta's oil producers.

---

13 Letter to CEAA from Gitga'at First Nations, January 16, 2012, filed as a comment letter with the NEB JRP for Northern Gateway.

14 See Open Letter to Premier Christy Clark, www.robynallan.com and Stephen Hume, Vancouver Sun, http://www.vancouversun.com/news/Hume+surrendered+sovereignty+pipeline+hearings+analyst+warns/6495354/story.html

2. Kinder Morgan

Kinder Morgan operates a 300,000 barrels per day pipeline that extends from Edmonton, Alberta to Burnaby, BC and onto Washington State. Throughput on this pipeline was 225,000 barrels per day until 2005 when the NEB approved pump upgrading to increase total capacity to 260,000 barrels per day.

In 2006 the company applied for and received permission to construct the TMX-Anchor Loop—a 157 kilometre pipeline addition. The application was filed on February 21, 2006 and approved eight months later in October 2006. This project also increased capacity by 40,000 barrels per day allowing Kinder Morgan to reach a total capacity of 300,000 barrels per day by 2008.[15]

In 2005 and 2006 NEB approvals increased pipeline throughput capacity by 33 percent without a full environmental review process. The pipeline portion of the 2006 request—the TMX-Anchor Loop—did require a Certificate of Public Convenience and Necessity under section 52 of the NEB Act.

A section 52 process automatically triggers the requirement for an environmental screening as required under the *Canadian Environmental Assessment Act.* The NEB, however, decided not to undertake a comprehensive study because a project description had been filed in 2005 and "Since the Project does not require more than 75 km of new RoW, a comprehensive study under the CEA Act was not required."[16]

Increasing throughput of Kinder Morgan's Trans Mountain pipeline by one-third represents a significant increase in inland pipeline spill risk, but the NEB did not adequately recognize the potential threat to BC's and First Nations' lands and freshwater river and streams or to British Columbians.

In 2006, 2008 and 2011 Kinder Morgan applied for and received permission from the NEB to reallocate crude oil from BC and Washington refineries for export by tanker to offshore markets.

This diversion of crude oil from onshore refineries to off-shore markets has increased tanker traffic in Burrard Inlet significantly from 22 oil tankers in 2005 to 71 by 2010. No environmental review to assess marine spill risk from increased activity was undertaken.

Vancouver Mayor, Gregor Robertson, and other BC mayors and elected officials have criticized the NEB for making major decisions about Kinder Morgan's capacity to sell oil to offshore buyers, without any public hearings in Vancouver and without consulting coastal communities.[17] The NEB elected to hold a one-day hearing in Calgary.

Table 2 below, illustrates the increased capacity on Kinder Morgan's existing pipeline as well as the reallocation of crude oil for marine export and its impact on tanker traffic.

15 Terasen Pipelines (Trans Mountain) Inc., OH-1-2006, October 2006, NEB, page 1.
16 Ibid.
17 Mayors outraged at lack of consultation in pipeline decision, Vancouver NEWS11130.

Table 2

Kinder Morgan Existing Trans Mountain Pipeline

Year	Marine Exports barrels per year	Oil Tankers	Pipeline Capacity barrels per day
2005	7339857	22	225000
2006	8252889	n/a	225000
2007	13452931	37	260000
2008	13898065	42	300000
2009	24641567	65	300000
2010	26727699	71	300000
2011	15,090198	32[18]	300000

Source: Port Metro Vancouver

In April 2012, Kinder Morgan announced its intention to expand pipeline capacity further by twinning its existing pipeline route. This would allow a total of 850,000 barrels per day to move from Edmonton to Burnaby's Westbridge Tanker Terminal in Burrard Inlet.

The proposed $5 billion twin pipeline plan is not intended to deliver crude oil to land based refineries, but would be used to deliver crude oil to expanded marine facilities where it would be loaded onto supertankers and shipped to China and other Asian markets.

Kinder Morgan has indicated that the required tanker traffic for this volume of crude oil is roughly one oil tanker per day transiting Burrard Inlet.[19] The project is slated to be built by 2017. Kinder Morgan anticipates filing its application for approval of the new pipeline and marine facilities with the NEB in 2014.[20]

When Kinder Morgan files its application with the NEB it is very important that the design features for capacity expansion be clearly identified and understood. Kinder Morgan is suggesting that it intends to build a 550,000 barrel per day pipeline. However, it is possible Kinder Morgan's pipeline will have the capability to expand throughput with added pump stations and pumping power, and that, similar to Northern Gateway, 550,000 is the minimum capacity under the design features.

If Kinder Morgan could expand capacity by upgrading the pipeline's pumping power similar to Northern Gateway, the daily supply reaching Burnaby could be 1.1 million barrels a day—not 850,000 barrels per day. This could significantly raise the volume of tanker traffic in Burrard Inlet beyond the anticipated one tanker a day. Under an expanded capacity destined for marine export, the traffic volume could reach 475 crude oil tankers a year. Coupled with Northern Gateway's 340, this represents 815 crude oil tankers a year transiting BC coastal waters.

18 Decrease due to oil producer/refinery arrangements to ship through pipeline to Washington State refineries
19 Globe and Mail, April 12, 2012, U.S. company plans billion-dollar expansion of Trans Mountain pipeline.
20 Ibid.

3. Conclusions

We've been told Northern Gateway represents 220 tankers a year when it could be upwards of 340 per year. We've been told that twinning Trans Mountain means a tanker a day in Vancouver's inner harbour, when its possible the project could represent upwards of 475 oil tankers a year. Taken together the two projects could expose BC to 2 million barrels of crude oil a day by land, and around 800 tankers a year transiting vulnerable coastal waters.

BC residents need to know, in advance—before any additional crude oil pipeline capacity is built—what the oil industry's intention is with respect to the role and purpose of BC's economy as an enabler of Alberta's oil industry's strategy.

The current NEB JRP review process has not included the full scope of the environmental risk Northern Gateway poses to BC, nor will an appropriate assessment likely occur when Enbridge's expansion plans are implemented. If risk is to be adequately assessed it must take place now.

Given the changes in the role and scope of the NEB review process, it is also necessary for BC to reclaim its right to adequately protect the public interest of BC and ensure that a full environmental review takes place. The province also needs to ensure when Kinder Morgan files for approval, that the province maintains its parallel review process in the interest of British Columbians.

This report identifies the need for:

1. a broadened scope of the environmental risk assessment of Northern Gateway within the existing JRP process that adequately addresses the intended capacity of the pipelines and the tanker traffic triggered by it;

2. a revision to all environmental assessments submitted by Enbridge that adequately incorporates the broadened scope as well as the shortcomings of the current assessment as identified in the expert reports filed by intervenors;

3. the government of British Columbia to take action and protect BC's statutory right for final decision for this project by removing Northern Gateway from the Equivalency Agreement with the NEB. It should then undertake a complete, unbiased, assessment of the full environmental risk posed by Northern Gateway; and

4. assurance by the government of BC that the responsibility to assess Kinder Morgan's proposal on behalf of the public interest of BC will not be delegated to the NEB.

The province of Alberta established its role as a government intervenor in support of Northern Gateway and submitted written evidence to the JRP. The province has not submitted written evidence on behalf of the people of BC and now, the opportunity has long since passed.

It is imperative that the full weight of BC's sovereign power for the responsibility for the environment be brought to bear on this issue. The continued reluctance of the Premier to adequately inform herself of the risk BC faces is unacceptable.