

**Pro Information Pro Environment United People Network**  
**To Trans Mountain Pipeline ULC**  
**Trans Mountain Expansion Project File OF-Fac-Oil-T260-2013-03-02**  
**Hearing Order OH-001-2014**

Excerpt from our Intervenor application: “Members of the PIPE UP Network have both local and academic expertise in many areas relevant to the proposed expansion, including but not limited to: air quality, agriculture, water quality, fish habitat, and teacher/student/first responder health and safety requirements” <https://docs.neb-one.gc.ca/ll-eng/llisapi.dll?func=ll&objId=2415624&objAction=browse>

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### **EMERGENCY PREPAREDNESS**

#### **References**

**lai** “Board” letter dated April 46, 2014 at this link in Regulatory Documents:

<https://docs.neb-one.gc.ca/ll-eng/llisapi.dll?func=ll&objId=2450980&objAction=browse&viewType=1>

Page 6:

“Emergency management, incidents, and spill remediation

Each Board-regulated company **must** have an emergency management program that must include (in addition to general management system elements):

- **the identification and analysis of potential hazards;**
- the evaluation and management of risks associated with all hazards;
- an up-to-date emergency procedures manual that is filed with the Board;
- liaising with agencies that may be involved in an emergency situation;
- taking all reasonable steps to inform all persons who may be associated with an emergency response activity on the pipeline of the practices and procedures to be followed;
- **having a continuing education program for the police, fire departments, medical facilities, other appropriate organizations and agencies, and the public residing adjacent to the pipeline to inform them of the location of the pipeline, potential**

**emergency situations, and the safety procedures to be followed in case of an emergency;** •  
procedures for the safe control or shutdown of the pipeline system in the event of an emergency; •  
sufficient response equipment; • training to instruct employees on the emergency procedures and  
emergency equipment; and • a verifiable capability to respond to an emergency demonstrated through  
emergency response exercises.” (my emphasis)

**laii** Application *Volume 7 - Risk Management of Pipeline and Facility Spill Assessment* page 58 states:

“The liaison makes sure that all necessary external groups are contacted, made aware of the issues and kept up to date as the incident develops. This role of ongoing communication and regular updates is an important part of the success of any emergency response. **KMC’s goal is to provide full and timely notification to regulatory bodies, Aboriginal communities, and other key stakeholders such as affected municipalities and first responders.**” (my emphasis)

**laiii** Application *Volume 7 - Risk Assessment and Management of Pipeline and Facility Spill* page 64 states:

“4.7 Community Awareness and Emergency Preparedness KMC’s Public Awareness Program is an integral component of the organization’s Damage Prevention Program. **Public awareness serves to alert the public to the presence of pipelines in the community as well as provide safety and damage prevention messaging to those who live or work near KMC’s assets in Canada, or who may be called upon to respond in the event of a pipeline emergency.** The program includes two main subprograms: (1) Continuing Education, and (2) Consultation. This program is conducted in English with documents translated into other languages as deemed necessary; for example, the Working near Pipelines brochure is translated into Punjabi, Korean, Tagalog, and Chinese Traditional. 4.7.1 Continuing Education Program The baseline contact for emergency responders, including provincial emergency programs in communities where the Trans Mountain pipeline operates, is direct mail once every three years. The direct mail campaign addresses: • how to participate in KMC’s emergency response drills, table-top exercises, or equipment deployments; • how to notify KMC in the event of a suspected pipeline emergency; • where to get information on oil characteristics and recommended equipment for responding to a pipeline emergency; and • information about KMC’s ERPs specific to their local municipality, county, or regional district. (my emphasis)

In addition to the baseline contact information, continuing education is provided through a programs are delivered by KMC operations staff in consultation with other training providers, as required. **In addition to table-top exercises and joint field deployment exercises, other topics presented and discussed include:** • the pipeline route(s); • the types of petroleum products transported; • how pipelines are identified by above ground signage; • pipeline safety features; • **petroleum product hazard awareness;** • KMC and first responder emergency response procedures and respective roles and responsibilities; • firefighting equipment; and • KMC emergency response exercises. Other continuing education training includes fire equipment training, storage tank courses, deployment exercises, ICS training, table-top exercises and participation in events as requested by outside stakeholders. **These sessions focus on the overall response structure used by KMC, hazards associated with the pipeline operation and petroleum products transported,** and many safety and general interest topics, as well as serve as a forum for information exchange.” (my emphasis)

**laiv** Transportation Safety Board report of 2005 spill at Kilgard Creek, Abbotsford, B.C.”

<http://www.tsb.gc.ca/eng/rapports-reports/pipeline/2005/p05h0044/p05h0044.asp>

“At 1130 mountain daylight time<sup>1</sup> on **July 8**, the CCC received an odour complaint from a local resident. The CCO used Terasen’s Odour Complaint Form to record the details, then notified the company’s Burnaby operator, who investigated the odour complaint around 1400. The operator could detect crude oil odours, but could not determine the source.

At 2138 and 2355, the CCO received further odour complaints from local residents in the same vicinity. After completing an Odour Complaint Form, the CCO contacted Burnaby to dispatch a Terasen operations employee to investigate. On 08 July 2005, around midnight, the operations employee proceeded to Ward Road. While crude oil odours were apparent near Ward Road, he did not discover crude oil.

**During the week leading up to the discovery of the location of the rupture, Terasen received five odour complaints from the area immediately south of the Sumas Tank Farm. Each complaint was investigated by a Burnaby operations employee without determining the cause of the odours.**

On **July 15** at 1030, a Terasen employee discovered crude oil in Kilgard Creek at the intersection of Ward Road and Upper Sumas Mountain Road. Because the vegetation along the right-of-way (ROW) and over the ditch and creek was very dense and 2 m tall, the employee did not walk the ROW to locate the source of the crude oil leak. The company had scheduled this section of the ROW for annual vegetation cutting during October. The Terasen employee was wearing basic personal protective equipment (PPE): safety glasses, boots, and Nomex coveralls. However, he was not equipped with the additional PPE appropriate for the hazards associated with this occurrence, such as a respirator or self-contained breathing apparatus, and a benzene detector or any other type of volatile organic detector.”

#### **“Supervisory Control and Data Acquisition and Leak Detection Systems**

The management of day-to-day pipeline operations is accomplished through Terasen's highly sophisticated SCADA system. Combined with the company's leak detection system, this provides a very effective method for early detection of pipeline leaks. However, the two Sumas pipeline sections were not covered by the leak detection system. Instead, Terasen depended upon a less efficient system that depends on deviation alarms set at the Sumas tanks to monitor any volume changes that might occur in the tanks and transfer lines when the two Sumas pipelines were idle.

However, the release of crude oil occurred when it was being delivered to and from the Sumas Pump Station. **From the time of the first odour complaint, the deviation alarm system failed to detect the loss of product over a seven-day period. The leak of product occurred outside of the scope of this type of detection system. There were no apparent technical reasons for excluding the two Sumas pipelines from the overall framework of the leak detection system.” (my emphasis)**

#### **Initial Response and First Responders**

Within four hours of arriving on site, the majority of the initial response, including locating the source of the leak, determining the extent of migration of the crude oil, and initiating containment (constructing three weirs) was completed by the FRS. Once assembled on site, Terasen's PLM response team added additional weirs, and began the clean-up and removal of spilled oil and contaminated soils. Terasen's response was handled efficiently and effectively by the initial PLM response group and later by the larger team controlled by the Incident Command System. The released oil was cleaned up quickly and contaminated soils were removed to a controlled area for disposal. Site restoration work is ongoing. Further monitoring is required to assess longer-term issues at and near the occurrence site.

First responders, such as police and fire departments, are charged with responding to emergency situations efficiently and effectively to protect life, property, and the environment. The initial response of FRS personnel was very effective, but because they had not been adequately informed by Terasen of the potential hazards of the products released from the pipeline, they lacked proper detection equipment to protect against potential occupational safety and health issues. The National Energy Board's *Onshore Pipeline Regulations* require that the company inform local emergency measures, fire department, and first responder personnel along the pipeline route of the location of the pipeline and the nature of the products being shipped. Terasen had not informed FRS personnel of the hazards or of the need for special types of equipment when responding to pipeline emergencies.” (my emphasis)

Iav Office of the Auditor General *Report of the Commissioner of the Environment and Sustainable Development Chapter 1 Transportation of Dangerous Products* [http://www.oag-bvg.gc.ca/internet/docs/parl\\_cesd\\_201112\\_01\\_e.pdf](http://www.oag-bvg.gc.ca/internet/docs/parl_cesd_201112_01_e.pdf)

Excerpts re National Energy Board:

Page 21

There is a lack of follow-up by the Board on identified deficiencies 1.52 We examined the National Energy Board’s compliance verification activities, such as inspections and audits, for the period between 2007 and 2010. We looked to see whether the Board had monitored the regulated companies in a manner that would allow it to determine if the companies were meeting the requirements to transport dangerous products by pipeline according to established legislation, standards, and Board expectations.

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1.56 Cancellation of compliance verification activities. We noted that of the 56 planned high-risk compliance verification activities selected for review, 11 (20 percent) were later cancelled by the Board (Exhibit 1.6). A rationale was provided for the cancellation in 7 of the 11 cases. For 4 of the 11 cancelled activities, there was no evidence that they would be rescheduled or addressed through another compliance activity despite the fact that they were identified by the Board through its risk prioritization process as being high risk.

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1.58 Required follow-up on gaps and deficiencies. We noted that 29 of the 45 compliance activities (64 percent) identified multiple gaps and deficiencies with regulated companies’ systems and processes designed to ensure safety, pipeline integrity, and protection of the environment (Exhibit 1.6). **Of concern is that in 27 of these 29 cases (93 percent), we found no evidence that the Board followed up with the companies to determine whether the gaps and deficiencies had been addressed. As a consequence, we have concluded that the Board has not exercised a key element of regulatory monitoring: ensuring that identified weaknesses have been corrected by the regulated companies.** Documenting the nature and extent of a completed compliance activity is essential to demonstrate that the Board is meeting its regulatory responsibilities. Inadequately documenting the results of compliance activities and the verification of actions taken also makes it extremely difficult for staff to follow up on those activities, which is especially critical whenever there is high employee turnover. (my emphasis)

Iavi National Energy Board report of January 2012 spill

<http://www.neb-one.gc.ca/clf-nsi/rsftyndthnvrnmnt/sfty/nvstgtnrprt/trnsmntnsmstnk121lk/trnsmntnsmstnk121lk-eng.html>

**lavii** Abbotsford News reports of January 2012 spill at Sumas Tank Farm

<http://www.abbynews.com/news/138207349.html>

<http://www.abbynews.com/news/139269138.html?mobile=true>

**laviii** Transportation Safety Board spill data

<http://www.tsb.gc.ca/eng/stats/pipeline/2012/ss12.asp>

Indicates that pipeline spills have steadily increased from less than 40 per year to more than 160 per year in the past ten years. The data for 2012 shows that 19% of the spills were from transmission lines and 21% were from pump stations.

**laix** Application *Risk Assessment and Management of Pipeline and Facility Spills* page

“6.2.1 Air Greatest effects on air quality occur immediately following an oil spill as a result of evaporation of volatile (light end) hydrocarbons. As noted in Section 5.2.1, light end components of C1 to C12 will generally evaporate within the first 48 hours of exposure, with highest concentrations during the first 12 hours. Some of the most toxic components of the oil (benzene, toluene, ethylbenzene, xylenes or BTEX) fall into this range. **Ground-level hydrocarbon concentrations would be highest in the immediate vicinity of an oil spill and would be dramatically reduced within a matter of hours, but elevated concentrations in air could continue for days to weeks depending on spill volume, oil characteristics, and spill environment. Exposure through secondary pathways also could occur if released hydrocarbons ‘fall-out’ or deposit from the air onto the ground and enter the ‘food chain’.** When discussing ecological and human health effects, the potential effects associated with short-term and long-term exposure to hydrocarbons are referred to as acute and chronic effects, respectively. Human health effects that could occur following hydrocarbon evaporation, dispersion and inhalation are discussed in Section 6.3.2. Trans Mountain will conduct air quality modeling for specific spill scenarios to predict ground- level hydrocarbon concentrations for the Westridge Marine Terminal spill scenario and support quantitative ERA and HHRA studies to be submitted in early 2014 to verify conclusions and inform potential mitigation and emergency response planning.” (my emphasis)

Without treatment or physical removal, oil would be a long-term source of groundwater contamination if it contacted the water table. **For this reason, spill response efforts aim to reduce potential for groundwater contamination by removing pooled oil and affected surface materials as quickly as possible, and as deeply as needed to remove contamination so that aquifers are not affected. Residents of the Fraser River Valley noted the importance of aquifers that provide domestic and community water sources.** (my emphasis)

**lax** Application 6.3.2 “Human Health Stakeholders at various community meetings and the Fraser Health Authority and Vancouver Coastal Health Authority expressed an interest in understanding the potential human health effects that could result following a spill in an urban environment. **Urban areas are considered sensitive for human health effects because of their high population density and likely presence of sensitive individuals (i.e., infants and young children, the elderly, pregnant women, and individuals with compromised health).** In order to experience physical effects from

hydrocarbon exposure, a person must inhale, ingest or touch the spilled product, and be exposed for a long enough period for it to be harmful. This can happen through a number of pathways, including: **(my emphasis)**

• inhaling hydrocarbon vapours released from spilled hydrocarbons; • direct contact with contaminated soil, or ingesting food that is grown in contaminated soil; • **drinking from a source contaminated by a spill; and • eating plants or animals contaminated by a spill. (my emphasis)**

**Iaxi** Application Volume 6B Page 24 “The Site-Specific ERPs will consider the contractors’ risk assessments (Section 5.1.2 of Volume 4B) completed as part of an employer’s duty to ensure that the health and safety of every employee is protected required by Section 124 of the Canada Labour Code.” <http://laws-lois.justice.gc.ca/eng/acts/L-2/page-55.html#h-51>

Canada Labour Code Section 124. Every employer shall ensure that the health and safety at work of every person employed by the employer is protected.

Section 125. (1) Without restricting the generality of section 124, every employer shall, in respect of every work place controlled by the employer and, in respect of every work activity carried out by an employee in a work place that is not controlled by the employer, to the extent that the employer controls the activity,

**Iaxi** Auditor General of B.C. *Catastrophic Earthquake Preparedness* FINAL pdf <http://www.bcauditor.com/pubs/2014/report15/catastrophic-earthquake-preparedness> Page 4 “In 2013, EMBC responded to approximately **6,000 incidents related to dangerous goods spills**, search and rescue events, major floods, fires, landslides, and avalanches. Page 12 “**Southwestern British Columbia is situated in the Pacific Ring of Fire, an area where some of the world’s largest earthquakes occur. Most of the areas at highest risk in the province are also the areas with the highest population density**” Page 15 **The diversity of BC’s climate and geography creates a number of natural hazards including earthquakes, blizzards, wildfires, floods and landslides to which EMBC is tasked to respond. In addition, there are a number of human-caused hazards for EMBC to deal with including oil spills, motor vehicle accidents and electrical power outages.**” Page 18 “While only a fraction of these emergencies may require an extensive response by EMBC, they consume the majority of staff time. **At the same time, EMBC’s lack of critical resources such as a logistics planner and its limited funding constrain the organization’s abilities.**” **(my emphasis)** In this report, EMBC noted that it did not have sufficient personnel with the experience, knowledge and training to effectively respond to an earthquake and tsunami event and its **standard operation procedures were inadequate. EMBC also noted that: § some local governments identified that their plans were not adequate; § a number of communities lacked information and education on what to do and what local responders should do; and § the use of the Provincial Emergency Notification System is cumbersome, resource-consuming and prone to errors. EMBC included strategies to improve its performance based on its current capacity. It also identified that risks to communities would continue without additional resources and program enhancements.**

### Preamble

One of the statistical certainties with regard to pipelines is that they spill. In the case of the current Trans Mountain Pipeline there have been 80 spills over the past 60 years. However, at the Mar 19, 2014 meeting of the Fraser Valley Regional District, that PIPE UP Network members witnessed and have an audio recording of; numerous questions from Directors with regard to Emergency

Preparedness were not completely answered. Kinder Morgan Trans Mountain staff admitted that the Emergency Preparedness plans would be completed in the coming months. In addition, it became apparent during the delegation that local community first responders would be relied upon in the event of a spill.

**Information Requests based on the above noted references**

**Ibi** Taking the above noted information into account, please provide details with regard to who will be providing first response within the first hour of the report of an incident by either the public or your control facility and who will pay the first responders.

**Ibii** Please provide your plan to respond to an incident with less than 100 long term permanent staff. Please provide an organization chart and construction and post construction annual budgets reflecting Kinder Morgan Trans Mountain staff who will be performing first responder duties within the first hour of an incident report.

**Ibiii** In which jurisdiction in Canada are your corporate headquarters located. Which province(s) do you pay corporate income taxes to?

**Ibiv** Please provide information in regard to the taxation category (ie industrial or commercial) the assessed value of your property in each jurisdiction and the dollar amount you are / will pay each of Hope, the City of Chilliwack, the City of Abbotsford, the Township of Langley and the City of Surrey.

**Ibv** Please provide information with regard to how you are / will compensate the above noted jurisdictions with regard to public services (ie. fire, police, ambulance, hospitals) used in the event of a major incident.

**Ibvi** How will you prevent spills from occurring which differs from those emergency preparedness and maintenance policies and procedures you have had in place since acquiring the current Trans Mountain pipeline in 2005?

**Ibvii** Will you require the full disclosure of the contents of a spill from your shippers in order to protect first responders and public health from Hydrogen Sulfide [H<sub>2</sub>S], PAHs and VOCs per Section 124 of the *Canada Labour Code* ?

**Ibviii** At what intervals will staff be located in order to respond to, stop the spill or evacuate ALL affected people within one hour (per the reference in the application human health risk analysis of “one hour exposure”)?

**Ibix** Will ALL Kinder Morgan Trans Mountain contractors be required to operate under the *Canada Labour Code* Sections 124 / 125 during / after construction and during maintenance?

**Ibx** How does the *Canada Labour Code* affect first responders when they are responding to a spill incident on Kinder Morgan Trans Mountain ROW? Are they covered by the *Canada Labour Code* Sec 124? If not why not?

**Ibxi** ?Will Kinder Morgan Trans Mountain Pipeline be providing training and protective gear to all first responders (police, firefighters and paramedics) who would be called to a pipeline emergency situation? If not, who do you purport to be responsible for such costs?

**Ibxii** Does strict enforcement of regulations have a negative economic impact on your operations? If so, how much have you benefitted per year from non-enforcement of regulations by the National Energy Board and the Transportation Safety Board (per the 2010 Auditor General of Canada report)?

**Ibxiii** Why does it take you up to two years to repair an "anomaly" as is the case with the current maintenance / remediation near / in Kilgard Creek, Abbotsford B.C.?

## **II Human Health Risks re Air and Water Quality**

### **References**

**Ilai** "A HHRA was also completed by KMC in 2009 following a release of oil at the Burnaby Terminal (SLR Consulting (Canada) Ltd. 2009). Spilled oil was retained onsite in the tank area and surface water retention pond but volatile hydrocarbons were released to the atmosphere. This HHRA evaluated potential health risks to residents and park users via inhalation of BTEX and H<sub>2</sub>S and concluded that there were no acute risks to human health during the release."

**Ilaaii** Alberta Energy Regulator Mar 31, 2014 *Report of Recommendations on Odours and Emissions in the Peace River Area* "[41] Generally emissions associated with heavy oil operations consist of the following compounds: • Water, carbon dioxide, nitrogen, and oxygen. • Reduced sulphur compounds (RSCs): a complex family of substances characterized by the presence of sulphur in a reduced state (e.g., hydrogen sulphide [H<sub>2</sub>S] and mercaptans). • Volatile organic compounds (VOCs): organic chemicals that are liquid and have a high vapour pressure at room temperature (e.g., natural gas components such as methane, ethane, and propane). • Polycyclic aromatic hydrocarbons (PAHs): a group of hundreds of organic chemicals characterized by multiple fused aromatic (benzene) ring structures and alkylated substituted analogues." Page 22

References to Groundwater and Aquifers in the Application Volume 5C <https://docs.neb-one.gc.ca/II-eng/IIisapi.dll?func=II&objId=2393181&objAction=browse&viewType=1>  
[V5C TR 5C5 01of17 GROUNDWATER - A3S1U8](#) *Groundwater Technical Report*

**Ilaaiii** Provincial and Federal legislation. It is, therefore, essential that the RGS support ongoing monitoring and management of the region's groundwater supply through water conservation measures, nutrient management initiatives, Best Management Practices in commerce and -industry, environmental farm plans, and groundwater protection legislation. Although most of the groundwater resources in the FVRD are currently in good health, several of the aquifers, such as the Abbotsford-Sumas, Vedder, and Chilliwack-Rosedale aquifers, are considered vulnerable to contamination. B.C. is the only province in Canada that has no legislation to protect groundwater resources. Action: Protect the region's potable surface and groundwater resources by supporting water conservation and stormwater management measures and by supporting the development of needed water protection legislation." Page 15

References to Aquifer Mitigation in Application Volume 5C pages 2, 5 – 8, 10, 14, 16

**Ilaiv** Crude Monitor Christina Dilbit *Most Recent Sample Comments: CDB-802, Feb 17, 2014*  
<http://www.crudemonitor.ca/crude.php?acr=CDB>

**Benzene 1 year average 0.27 Toluene 1 year average 0.45 (my emphasis)**

**Ilav** California Department of Education has a Guidance Protocol for School Site Pipeline Risk Analysis <http://www.cde.ca.gov/ls/fa/sf/protocol07.asp>

A fundamental premise of this Protocol is to present an estimating method that is simple while still providing reasonable risk estimates for policy decisions. The calculations are based on certain assumptions that, by definition, are part of the Protocol. The estimates provide values that are intended for comparison with a numerical Individual Risk Criterion (IRC) specified by CDE. An IR of 1.0E-06 (one chance in a million each year) has been selected based on regulatory practice for the siting of industrial facilities with hazardous chemicals in the United Kingdom and the Netherlands

New school campus site that lies within **1,500 feet of a pipeline operating at a pressure of 80 psig or higher**, according to Title 5 Site Selection standards or CDE plan submittal and certification requirements. The requirement covers pipelines carrying chemical products, natural gas, and other hydrocarbon products. CDE has determined that high capacity water lines are also included, but the approach in evaluating them is different, as discussed later in Section 4.

#### 4.2 *General Data Requirements*

The data required for a risk analysis include pipeline data and campus site data. Some information that would aid in a risk analysis is proprietary to the pipeline operator. A LEA risk analysis usually must rely on publicly available information.

In general, the required data include:

operating at a pressure of 80 psig or higher, according to Title 5 Site Selection standards or CDE plan submittal and certification requirements. The requirement covers pipelines carrying chemical products, natural gas, and other hydrocarbon products. CDE has determined that high capacity water lines are also included, but the approach in evaluating them is different, as discussed later in Section 4.

#### 4.2 *General Data Requirements*

The data required for a risk analysis include pipeline data and campus site data. Some information that would aid in a risk analysis is proprietary to the pipeline operator. A LEA risk analysis usually must rely on publicly available information.

In general, the required data include:

- The location of the proposed school campus site, including roads and major terrain feature boundaries;
- The location of the pipeline with respect to the proposed school campus site, and specifically the segment lying within the 1,500-foot boundary zone;
- Land use and terrain characteristics adjacent to and within the 1,500-foot zone;
- The pipeline diameter, operating pressure, and for liquid pipelines, the product flow rate; and
- Pipeline operating history information, especially records of any previous accidental releases of product and the repair history, if available.

A Phase I Environmental Assessment study will sometimes have identified hazardous material pipelines near a campus site and several key characteristics of a pipeline such as:

- Location;
- **The product transported;**
- Diameter;
- **Operating pressure;**
- Materials of construction; and
- **Date of construction.**

**(my emphasis)**

**Schools in close proximity to the Trans Mountain pipeline RED Flag - within 200 metres** or adjacent or crossed by pipeline BLIICK Flag - within several blocks of the pipeline Hope SD#78 Black Flagged; Silver Creek Elem., C.E. Barry Intermediate, Hope Secondary, Coquihalla Elem.

Chilliwack SD#33 **Red Flagged; Vedder Middle, Watson Elem., Unsworth Elem., John Calvin Elem. [Private]**, Black Flagged Rosedale Elem/Middle, East Chilliwack Elem., Unity Christian Middle/Sec. (Private), Fraser Valley Distance Ed., Chance Alternate, Sardis Elem., Sardis Sec., Tyson Elem., Mount Slesse Middle, LaVerendrye (French Elem.), Yarrow Community Elem., Barrowtown Elem.

Abbotsford SD#34 Black Flagged Upper Sumas Elem., Auguston Traditional Elem., Prince Charles Elem., Abbotsford Christian Middle &Sec. fPrivate), Sandy Hill Elem., Abbotsford Christian Elem., Clayburn Middle, Robert Bateman Sec., Dr. Thomas A. Swift Elem., Dasmesh Punjabi fPrivate), Matsqui Elem., Cornerstone Christian Elem. &Middle (Private), Dr. Roberta Bondar Elem., Mennonite Educational Institute Elem. (Private), Mennonite Educational Institute Sec. [Private), Mt. Lehman Elem., Bradner Elem.

Langley SD#35 BLACK Flagged Willoughby Elem., Ft. Langley Elem., Langley Fine Arts School, Alex Flope Elementary, Topham Elem., Kennedy Elem., West Langley Elem., Dorothy Peacock Elem.

SD#36 Surrey Port Kells Elem. Anniedale Traditional Elem. Harold Bishop Elem. Guildford Public Library and Recreational Centre Holly Elem. Hjorth Rd. Elem. Mary fane Shannon Elem. Guildford Park Sec. Ellendale Elem Forsyth Rd. Elem. Dogwood Elem. Erma Stephenson Elem. Fraser Heights Sec. Fraser Wood Elem. Ecole Riverdale Elem.

**Ilvii** Letter dated March 18, 2014 from Greg Toth of Kinder Morgan Trans Mountain submitted to FVRD Directors / public at the FVRD Committee of the Whole meeting March 19, 2014.

“Further to your letter dated December 12, 2013, the following addresses the issues and questions posed in the Fraser Valley Regional District staff report dated November 18, 2013. I have enclosed a USB version of our Application for your quick reference as needed (USB to be provided March 19, 2014).

3..8. What measures will be taken to prevent the contamination of nearby canals, wells, and other water sources for irrigation in the event of a spill?

- Protection of the environment is our highest priority. Construction will be completed in accordance with all regulatory conditions, the Environmental Protection Plan and use of appropriate construction practices. Water quality will be monitored during all instream activity. Each watercourse will be approached correctly, so the cumulative impact of changes to all the crossings and the surrounding watershed will be limited.
- In our Application, Volume 6B (Pipeline Environmental Protection Plan) and 6C (Facilities Environmental Protection Plan) provides the details of protection measures that will be undertaken during construction of the Project.
- Trans Mountain has comprehensive spill response plans in place for TMPL and existing facilities. These plans are continually updated and are regularly practiced through deployment exercises. While the specific strategies used in response to a spill will vary depending on the circumstances, the primary objectives in all cases is to ensure safety and to minimize environmental damage. There are a range of strategies available to achieve these objectives including: mechanical recovery (using skimmers), in-situ burning (controlled burning the oil), and dispersion (use of dispersing agents to dilute and disperse the oil reducing its concentration).

Further details can be found in Volume 7, Section 2 (Measures to Prevent and Mitigate Oil Spills) of our Application.

**Ilviii** Livestream recording of the Fraser Health Board Meeting Jan. 2013 of a question posed to Fraser Health Authority Public Health Officer Dr. Marcus Lem regarding the FHA concerns over risks to water quality if there was a diluted bitumen spill into the Abbotsford-Sumas Aquifer Dr. Marcus Lem, Medical Health Officer for Fraser East, in Abbotsford

<http://new.livestream.com/mediaco/FraserHealth2013PBM>

01:39:24 -- introduces himself as Marcus Lem with Fraser East

02:01:00 -- speaks about his concerns about the monitoring of dilbit

**Ilaix** Abbotsford News Oct 3, 2013 *Slide forces closure of Norrish Creek water system*

<http://www.abbynews.com/news/226377651.html> "City manager George Murray said no impact is anticipated to water service for residents of Abbotsford and Mission, because the supply from Cannell Lake and **the wells systems** can address demand at this time of year." (my emphasis)

**Ilix** Our Water Matters web site Groundwater Wells <http://www.ourwatermatters.ca/Groundwater-Wells>

“There are currently **19 groundwater wells in the south region of Abbotsford** that provide about 5% of the annual system supply. Of these wells, 15 are treated with chlorine or chloramines. **The wells are generally only operated during peak consumption periods of the year or when the Norrish Creek supply is off-line.**” (my emphasis)

**IIaxi** Abbotsford-Mission Water and Sewer Commission report WSC76-2013

<https://abbotsford.civicweb.net/Documents/DocumentList.aspx?ID=30614> To ensure that an adequate storage level was maintained in the lake, staff activated the groundwater wells and reconfigured the system so that **nearly all of Abbotsford was supplied from the wells.**” (my emphasis)

**IIaxii** BC 2010 Audit on Groundwater Ref <http://www.bcauditor.com/pubs/2010/report8/audit-management-groundwater-resources-british-columbia> (see Appendix: “Aquifer Maps Classified by Vulnerability to Contamination”)

**IIaxiii** Sardis Yarrow area that is listed as “Protected” on City of Chilliwack website, <http://www.chilliwack.ca/main/page.cfm?id=205>

**IIaxiv** 3.3 Study Area Boundaries The groundwater quantity and quality assessment discusses water quality and quantity within the Water Quality and Quantity LSA and the Aquatics RSA. The Water Quality and Quantity LSA is the area generally extending 100 m up-gradient of the centre of the proposed pipeline corridor to a minimum of 300 m down-gradient of the centre of the proposed pipeline corridor, as well as within 300 m of the proposed pipeline corridor, facility or HDD entrance in potentially vulnerable aquifer areas in hydraulic connection with the Footprint and in consideration of surface water drainage patterns along the pipeline corridor.

**IIaxv** Application Volume 7 Spill Risk Scenarios Pages 30 to 45

**IIaxvi** Application Volume 5 HYDROCARBON RELEASE “Evaporation begins immediately upon release of the oil. The rate and percent evaporation is dependent on the oil composition, available surface area for evaporation (i.e., spreading), and conditions of the receiving environment, such as wind, turbulence, and temperature of oil, water and air. The lighter hydrocarbon components, containing from 1 to 12 carbon atoms (C1 to C12), will generally evaporate within the first 12 hours of exposure. Some of the more toxic components of the oil (BTEX) fall into this range and therefore, the toxicity of the vapour plume dramatically reduces within a matter of hours”. Page 53

“Chemicals of Potential Concern In order to assess the potential health risks associated with possible secondary pathways, it was necessary to identify those chemicals emitted by the Project that, although only emitted into air, would be expected to deposit nearby and possibly persist or accumulate in the environment in sufficient quantities for people to be exposed via soil, food and water pathways. For this purpose, two categories of chemicals emitted from the Project were identified: • Gaseous chemicals, which are unlikely to contribute to human exposure via secondary pathways (i.e., CO, NO<sub>2</sub>, SO<sub>2</sub>). In addition, the health effects of these gaseous chemicals are strictly related to inhalation (i.e., these act at the point of contact). Accordingly, the gaseous chemicals were removed from further consideration in the multiple pathway assessment and only evaluated in the inhalation assessment. • Non-gaseous

chemicals, which may deposit in the vicinity of the Project, and persist or accumulate in the environment in sufficient quantities for residents to be exposed via secondary pathways (e.g., metals, PAHs, PHC fractions, sulphur-containing compounds and VOCs). The potential occurrence of these non-gaseous chemicals in the secondary pathways of exposure required further consideration.” Page 119

“Most of the chemicals identified in the air emissions inventory were evaluated either as individual chemicals (e.g., benzene) or as chemical constituents within a pre-defined chemical group (i.e., aliphatic and aromatic petroleum hydrocarbon fractions or benzo(a)pyrene [and equivalents]). Additionally, several of the chemicals were assessed both as an individual chemical (e.g., naphthalene) and as part of an aliphatic or aromatic group (e.g., in this case, the aromatics C9-C16). In addition, the carcinogenic PAHs were evaluated using two distinct approaches: • Approach 1: a mixture of carcinogenic PAHs was evaluated based on its benzo(a)pyrene content. The use of benzo(a)pyrene as an indicator of the potency of the mixture is based on the WHO review of air quality guidelines for PAHs (WHO 2000). Benzo(a)pyrene was chosen as the indicator PAH as its toxicity is best characterized out of all the **carcinogenic PAH compounds**. • Approach 2: the mixture of carcinogenic PAHs is evaluated by summing each individual PAHs toxic equivalency to benzo(a)pyrene (i.e., the toxic equivalency quotient [TEQ] approach). The toxic equivalencies of the PAH groups were determined using potency equivalency factors that have been adopted by Health Canada (2010a).” Page 127 (my emphasis) V5C 1 of 17 Pg. 4.3, TABLE 4.1.1 item 6 – Trans Mountain state “Ensure that during construction no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides or other chemicals are dumped on the ground or into water bodies. “Table 3.20 Chemical Mixtures Assumed for the Tanks Page 135 Effects of Chronic Inhalation Acute Inhalation: Eye Irritation, respiratory irritation, Neurological Effects; Chronic Inhalation: Nasal Irritation, Kidney Effects, Neurological Effects; Chronic Multiple Pathway: Kidney Effects, Liver Effects “

“5.1 Tank The findings pertaining to the potential health risks that could be presented to people from exposure to the COPC associated with the additional tanks to be installed at the tank terminals are outlined below. As discussed earlier, these emissions consist principally of lighter-end, volatile and semi-volatile hydrocarbons (C1 to C12), including both aliphatic and aromatic constituents. The latter constituents included BTEX (benzene, toluene, ethylbenzene and xylenes) as well as PAHs. Trace amounts of sulphur-containing chemicals make up the remainder of the COPC. The potential health risks associated with exposure to the COPC emissions via the primary inhalation pathway were assessed on an acute basis for both the residents and area users. In addition, the potential health risks that could result from chronic exposure to the emissions via both the primary inhalation and secondary exposure pathways were determined for the residents given the expected operating life of the Project (i.e., more than 50 years). Acute Exposure Scenario 5.1.1 The potential health risks (expressed as RQs) that could be presented to residents and area users from inhaling the COPC associated with the additional tanks at the tank terminals over the short-term are shown in Tables 5.1 to 5.3. The potential acute inhalation health risks are based on assumed exposure periods that range from a few minutes to 24 hours. Emphasis is given to ‘positive’ findings (i.e., RQs > 1.0) that signal possible health risks. Negative findings (i.e., RQs ≤ 1.0) are presented, but are not specifically highlighted. Examination of the findings revealed that in all cases the maximum predicted air concentrations of the COPC are lower

than the corresponding exposure limits (i.e.,  $RQ \leq 1.0$ ), and in most cases well below the air concentrations that would be expected to cause health effects.”

Volume 5 HYDROCARBON RELEASE Page Excerpts from Table **Duration Benzene 1 hour**

Table 4.1 Rates of Serious Health Conditions: COPD, Bronchitis, Lung cancer, Liver cancer, Leukemia, heart disease.

### **Preamble**

The application Volume 5 includes reports of human health risks from experts. These reports appear to be generic rather than specific to this pipeline and the contents being shipped. During the Kinder Morgan Trans Mountain pipeline expansion stakeholder session in June 2013 at Abbotsford that PIPE UP Network participated in, the environmental consultant admitted that her reports were not peer reviewed. This leads to an assumption that the human health risk assessments specific to this application were not peer reviewed. There are 23 schools that the ROW is on the school yards or within close proximity between Hope and Burnaby. To date there are no emergency procedures / protocols established between school districts, teachers or parents of students in the event of an 81<sup>st</sup> spill from the Trans Mountain Pipeline. The safety of Canadian children is as important as the safety of their American counterparts. The California Department of Education has a Guidance Protocol for School Site Pipeline Risk Analysis which provides a template for such calculations. Although it is designed to evaluate the siting of new schools it could conversely be used to quantify the risks of potential or existing pipeline sites.

Groundwater, aquifers, wells, canals, rivers and streams are valued in the Fraser Valley as a significant resource supporting virtually all area activities, including, but not exclusively to, farming, residential developments, sports and recreation and natural habitats. Clean water is essential to raise healthy food and dairy, irrigate crops and to fish spawning river, streams, marshes, sloughs located in the Fraser Valley. Many concerns have been expressed by residents in various information sessions held by Trans Mountain regarding potential impacts from your expansion application concerning methods of pipeline installation, possible water diversion, mitigations, potential for oil spills, response time and cleanup effectiveness including consideration of variable river run rates. Some of these concerns will be attempted to be addressed below and in VIII Risks to Salmon Habitat.

### **Information Request based on the above noted references**

**IIbi** Is the human health risk analysis re risks from hydrogen sulfide [H<sub>2</sub>S], PAHs and VOCs used in the application specific to this project or one that used generally by industry for all diluted bitumen pipeline applications?

**IIbii** If the analysis re human health risks was not from a generic study, please provide the CV of the “expert” who prepared the report. Please provide their contact information in order for PIPE UP Network to obtain specific information re human health risks from Surrey to Hope in the Fraser Valley air shed from PAHs, VOCs and sulfur dioxide.

**IIbiii** Why are there no reports from the January 2012 incident at the Sumas Tank Farm where there was more than six hours exposure to the emissions from the 90,000 litre spill in the human health risk analysis in the application?

**IIbiv** Why is “one hour exposure” used in the human health risk analysis when both of the spills in Abbotsford took much longer than one hour to stop?

**IIbv** Please provide the psi data for both the current and proposed Trans Mountain Pipeline expansion where it is on school property or within 457 meters of a school.

**IIbvi** Please provide Total Individual Risk Calculations to assess student safety where the pipeline easement is within 1500 feet (457 meters) of a school yard (as is required by law in California)

**IIbvii** Please provide a list of products that are being shipped through the current Trans Mountain Pipeline and the measures that have been taken to prevent serious injury or death to school children within 457 meters of the pipeline.

**IIbviii** Are there any plans to have air quality monitors on each and every school within a 5 km radius of the current and expansion ROWs?

**IIbix** Throughout your application you make reference to blasting while laying pipe or building facilities. Please specify exactly what areas you intend to blast in to install pipe/facilities and if any blasting is intended in or near watersheds, aquifers or other freshwater bodies.

**IIbx** In your application you state in BC your proposed pipeline crosses 35 mapped aquifers including 15 quaternary aquifers between Hope to Burnaby Segment or the Fraser Valley. You also identify the Sumas facility overlying a mapped aquifer. You have identified 5 horizontal directional drilled trenchless crossings proposed effecting potential artesian conditions in the Hope to Burnaby segment. How long will the horizontal drilling process take in each scenario? What are your reverberation statistics while drilling is ongoing? What criteria was used to select the 5 horizontal drill sites while omitting other river/stream crossings from this procedure?

**IIbxi** Does your groundwater analysis of 300 meters from the pipeline corridor take the spill risk scenarios in Volume 7 Pages 30 to 45 into consideration?

### **III Spill Prevention and Maintenance**

#### **References**

**IIIai** Office of the Auditor General *Report of the Commissioner of the Environment and Sustainable Development Chapter 1*

Transportation of Dangerous Products [http://www.oag-bvg.gc.ca/internet/docs/parl\\_cesd\\_201112\\_01\\_e.pdf](http://www.oag-bvg.gc.ca/internet/docs/parl_cesd_201112_01_e.pdf)

Excerpts re National Energy Board:

Page 21

**“There is a lack of follow-up by the Board on identified deficiencies** 1.52 We examined the National Energy Board’s compliance verification activities, such as inspections and audits, for the period between 2007 and 2010. We looked to see whether the Board had monitored the regulated companies in a manner that would allow it to determine if the companies were meeting the requirements to transport dangerous products by pipeline according to established legislation, standards, and Board expectations.” **(my emphasis)**

Page 22

1.56 “Cancellation of compliance verification activities. **We noted that of the 56 planned high-risk compliance verification activities selected for review, 11 (20 percent) were later cancelled by the Board (Exhibit 1.6).** A rationale was provided for the cancellation in 7 of the 11 cases. **For 4 of the 11 cancelled activities, there was no evidence that they would be rescheduled or addressed through another compliance activity despite the fact that they were identified by the Board through its risk prioritization process as being high risk.**” **(my emphasis)**

Page 23

1.58 Required follow-up on gaps and deficiencies. We noted that 29 of the 45 compliance activities (64 percent) identified multiple gaps and deficiencies with regulated companies’ systems and processes designed to ensure safety, pipeline integrity, and protection of the environment (Exhibit 1.6). **Of concern is that in 27 of these 29 cases (93 percent), we found no evidence that the Board followed up with the companies to determine whether the gaps and deficiencies had been addressed.** As a consequence, we have concluded that the Board has not exercised a key element of regulatory monitoring: ensuring that identified weaknesses have been corrected by the regulated companies. Documenting the nature and extent of a completed compliance activity is essential to demonstrate that the Board is meeting its regulatory responsibilities. Inadequately documenting the results of compliance activities and the verification of actions taken also makes it extremely difficult for staff to follow up on those activities, which is especially critical whenever there is high employee turnover. **(my emphasis)**

IIIa ii NEB “Reportable” Pipeline Incidents 2000 to 2012

<https://www.documentcloud.org/documents/812378-neb-pipeline-incidents-2000-2012-part-1.html>

Obtained / shared by CBC from Access to Information Trans Mountain Reportable Incidents:

2000 page 4	2007 page 61	2011 page 98
2002 page 27	2007 page 62	2011 page 100
2005 page 46	2008 page 63	2012 page 109
2006 page 54	2008 page 67	2012 page 111
2007 page 58	2008 page 69	
2007 page 59	2009 page 74	
2007 page 60	2009 page 83	

Kinder Morgan

Trans Mountain Dec. 16, 2002 “Reportable Incident” Sumas Tank Farm

<https://www.documentcloud.org/documents/812381-neb-pipeline-incidents-2000-2012-part-2.html>

2002-053	<p>On 16 Dec 2002, at approximately 16:20 MST, the floating roof on a tank at the TransMountain Pipelines Sumas facility located in Abbotsford BC, failed. At the time of reporting 1.5 m<sup>3</sup> of crude oil was reported to have been released from the tank into the adjacent spillway (secondary containment bermed area around tanks) .</p> <p>The tank feed was closed and isolated at 18:50 Dec 16th. Clean up and repairs were reported to be initiated as of Dec 16th.</p> <p>No injuries reported.</p> <p>No significant environmental impact other than that by the released product contained in the surrounding bermed area.</p> <p>TMPL reported at 14:00 MST Dec that the spill volume was closer to 10M<sup>3</sup>. and that vacuum trucks captured most of the product released.</p> <p>The failed roof was dismantled, removed from the tank, and replaced with another floating roof.</p> <p>Terasen conducted a detailed investigation of the roof failure including:</p> <ul style="list-style-type: none"> <li>" An independent failure analysis (by a tank engineering expert)</li> <li>" Component examination and metallurgical assessment by an independent consulting firm, and</li> <li>" Incident investigation by a multi-disciplined Terasen investigation team</li> </ul> <p>Terasen determined that the oil spill was caused by the structural failure of the floating roof. Degradation (corrosion) of key structural components (primarily the pontoon outer rim) in combination with the design of the roof and possibly the development of excessive rim loads or unbalanced loads (from the roof drain assembly) appear to have led to the development of a buckle through one pontoon. The buckle resulted in successive flooding of adjacent pontoons, allowing oil onto the roof deck and subsequently into the roof drain piping. From the roof drain piping oil was able to flow into the tank bay.</p> <p>The tank had been in service for 45 years and has undergone routine maintenance over its life and, most recently, an out-of-service inspection and repair in 1997.</p>
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**IIIaiii** Floating roof tanks [http://petrowiki.org/Floating\\_roof\\_tanks](http://petrowiki.org/Floating_roof_tanks) “Closed floating roof tank (CFRT) The closed floating roof tank (CFRT) is similar to an IFRT. It uses an internal floating roof but **eliminates natural ventilation** of the tank vapor space. Instead, the CFRT is equipped with a pressure-vacuum (PV) vent and may even include a gas blanketing system such as that used with [fixed roof tanks](#). Emissions from a CFRT are virtually the same as those from an IFRT, however, can be easily collected for further treatment if necessary. One such closed roof tank for benzene storage with associated vapor recovery equipment is shown in Fig. 2.” (my emphasis)

**IIIaiv** “On 12 and 26 June 2013, Kinder Morgan Canada Inc. (KMC) identified and reported two separate leaks stemming from crack features on the Trans Mountain Pipeline. These crack features were discovered as a result of inline inspections conducted by KMC in compliance with the National Energy Board (Board) letter issued 16 March 2012 directing KMC to complete baseline assessments on cracking features that may eventually lead to leaks.”

<http://www.neb-one.gc.ca/clf-nsi/rsftyndthnvrnmnt/sfty/brdrdr/trnsmntn/2013/so-t260-005-05-eng.html>

**IIIav** Transportation Safety Board report of July 2005 spill into Kilgard Creek  
<http://www.tsb.gc.ca/eng/rapports-reports/pipeline/2005/p05h0044/p05h0044.asp>

“Blasting in the Immediate Vicinity of the Pipeline

The immediate vicinity of the occurrence site is a mixture of residential and industrial been active for several decades. A common feature of these quarry operations is the regularity of heavy industrial blasting. Shockwaves from blasting in the vicinity of the pipeline can result in direct and indirect effects that, under certain conditions, may lead to the development of buckles. The closest quarry where blasting occurs is at Sumas Shale Inc., which is located between 300 and 600 m from the occurrence

site on top of a high rock hill. The closest blasting to the pipeline was 70 m from the pipeline, but several hundred metres upstream of the occurrence site.

Terasen has a standard for reviewing blasting adjacent to the ROW: Terasen Engineering Standards and Practices - MP 3120C. This standard specifies that the maximum horizontal peak particle velocity and maximum amplitude resulting from blasting should be less than 50 millimetres per second (mm/s), which is a more conservative standard than the 60 mm/s standard set by the British Columbia Ministry of Energy, Mines and Petroleum Resources. This standard was initially intended to address blasting works related to the construction of a facility, such as a roadway or buried service, across and/or in proximity to a pipeline and ROW.

Terasen's blasting standard does not permit any blasting within the ROW and requires the company to review blasting plans for any blasting within 100 m of the ROW. It may also require a review for blasting within 300 m of the ROW. **Although blasting at the local quarries occurred, on average, once every six days for the six months preceding the occurrence, the Terasen Crossings Specialist did not have any blasting records for the previous few years for the Sumas Mountain area.” (my emphasis)**

#### **“Events Leading up to the Buckle**

Evidence collected during the borehole excavations and cone penetration testing strongly suggests that the application of the landfill material disturbed the state of equilibrium of the native peat, silt, and sand/gravel layers. The increased loading caused by the imported dense landfill material resulted in the compression of the peat layer, along with consolidation of the soft silt layer. This, combined with heavy rains, and the regional dip of the competent soil below (sand/gravel and till), created a situation of creep in the layers above the competent soil.

The highly compressible peat surrounding the pipelines gave little lateral support, thus allowing the pipelines to be moved in a southwesterly direction, away from the area affected by the landfill operation. Evidence to confirm this movement was obtained from the metallurgical testing, the finite element analysis work, and detailed field testing. **As a result of a significant bending stress imposed on a pre-existing cold bend, the buckle and associated cracks formed in the cold bend and, subsequently, grew as a result of imposed cyclic stresses causing the pipeline to fail.” (my emphasis)**

**IIIavi** City of Abbotsford ENG 18-2014 report recommending increased aggregate mining on Sumas Mountain <https://abbotsford.civicweb.net/Documents/DocumentList.aspx?ID=39966>

“Effects on any Adjacent Property Jamieson Quarry is bordered on the north, east and south by properties that are currently extracting gravel or will be extracting gravel. To the west of Jamieson Quarry is a Kinder Morgan Tank Farm (Appendix 5).”

**IIIavii** U.S. Department of Transportation Safety Administration 1200 New Jersey Ave. SE Washington, DC 20590 Pipeline and Hazardous Materials 'JUN 9 2011 “FINDING OF VIOLATION

In its Response, KMEP did not contest the allegations in the Notice that it violated 49 C.P.R. Part 195, as follows:

Item IA: The Notice alleged that Respondent violated 49 c'P.R. § I 95.452(h)(2), which states:

§ 195.452 Pipeline integrity management in high consequence areas. (a) ... (h) What actions must an operator take to address integrity issues? (1) ... (2) Discovery of condition. Discovery of a condition occurs when an operator has adequate information about the condition to determine that the condition presents a potential threat to the integrity of the pipeline. An operator must promptly, but no later than 180 days after an integrity assessment, obtain sufficient information about a condition to make that determination, unless the operator can demonstrate that the 180-day period is impracticable.

The Notice alleged that Respondent violated 49 C.P.R. § 195.452(h)(2) by **failing to obtain and use information from an assessment to make a determination that a condition presented a potential threat to the integrity of the pipeline, within 180 days of the assessment.** Specifically, the Notice alleged that KMEP completed an integrity assessment on May 9, 2008, but did not obtain sufficient information to make a determination of discovery that a "60 day condition" existed until March 30, 2009, or 325 days following the completion of the assessment and 180 days past the regulatory deadline. **The Notice further alleged that Respondent failed to show that the 180-day period was impracticable in this case.**

Respondent did not contest this allegation of violation. Accordingly, based upon a review of all of the evidence, I find that Respondent violated 49 C.P.R. § 195.452(h)(2) by failing to obtain sufficient information about a condition within 180 days following completion of its May 9, 2008 integrity assessment." (my emphasis)

**IIIaviii** Application Volume 4A i. seismic/geological maps B4-4\_-  
\_V4A\_APPJ\_03THRU45\_OF\_45\_SEISM\_ASSESS\_STUDY\_-\_A3S1F8

**IIIaix** Application Volume 5C 1 of 17 Pg. 3.2,4.3 TABLE 4.1.1 item 3, 5 Section 8.4

**IIIax** Application Volume5 C 1 of 17 Page 4.3, TABLE 4.1.1 item 6 "Ensure that during construction no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides or other chemicals are dumped on the ground or into water bodies."

**IIIaxi** Volume 4A under 2.9.3 Seismic Hazards "Although no active faults (where rupture has occurred in the last 11,000 years) have been identified in BC...."

**IIIaxii** State of Washington Energy Facility Site Evaluation Council 2001

<http://www.efsec.wa.gov/Sumas2/adj2001/whatcomcoprefiled/dje-2.pdf> "Two faults, the Vedder Mt. fault and a previously unnamed fault that we now call the Sumas fault, have long been known along the sides of the Sumas Valley. However, new data now indicates that the faults are both larger and more active than previously known."

"A number of earthquakes have occurred along the traces of the Sumas and Vedder Mt. faults since 1964, indicating that the faults are presently active."

Page 8 "During earthquakes, the ground may slide significantly. Failure of the ground beneath structures is highly destructive. Because of this, designing a large, earthquake-proof structure that could withstand ground failure is impossible. Earthquake waves can cause clay, silt, and fine sand to act like liquids so that the ground literally flows, a process known as liquefaction. The floor of Sumas Valley is filled with thick, unconsolidated lake clay and silt that lie on more than 1000 feet of other fine-grained sediment. These sediments are vulnerable to shaking that could cause liquefaction. Figure 7 shows the area of the Sumas Valley underlain by sediment that has liquefaction potential"

**IIIax** Mar. 14 2014 Kinder Morgan Integrity Assessment KMC Integrity EA-TM-2014-004

**Preamble**

The “reportable incidents” that have been noted above lead to an assumption that Kinder Morgan Trans Mountain staff do not take spill prevention and maintenance as seriously as they should due to the toxicity of diluted bitumen. In the Sumas Mountain tank Farm spill Kinder Morgan Trans Mountain staff ignored three alarms over six hours before they acted. A nearby school air intake had to be closed down due to students having headaches and nausea. There is an assumption that the same staff and the same technology will be used on the Trans Mountain pipeline expansion.

Seismic active areas - When planning for seismic due diligence must be followed: Working on the premise that both earth quakes and oil pipeline ruptures/leaks can occur with little or no notice, is it prudent for all involved parties to consider possible consequences should an earth occur along the current and proposed expansion route; and like pipeline/facilities malfunctions, with earthquakes, it is not a question of if but when. In fact, it is well known and robustly documented that British Columbia as a highly seismic active province and in fact, we are constantly having earthquakes, 70 in BC in March and 2 as of this writing May 2014 and captured by/available in Natural Resources Canada datasets

**Information Request based on the above noted references**

**IIIbi** What new procedures will Kinder Morgan Trans Mountain staff use that differs from the one(s) they have used since 2000 in order to prevent spills?

**IIIbii** How many staff will be specifically responsible for spill response at the Edmonton control centre and along the pipeline from Edmonton to Burnaby?

**IIIbiii** Will staff between Edmonton and Burnaby be on duty 24/7? If not why not?

**IIIbv** What extraordinary procedures (eg. training school students / staff in diluted bitumen spill preparedness similar to earthquake preparedness drills) will there be in place with regard to schools in the vicinity of the pipeline ROW?

**IIIbvi** When I try to open the Application Volume 4A i. seismic/geological maps B4-4charts they are not displaying correctly. I assume these charts have some good information on them like what I assume is the wave motion on an earth quake with an epicenter around Vancouver from the Juan de Fuca plate on the first few charts, but the legends provide no relevance they display as jibber, unicode or like odd characters, rather than information when opened and zoomed in. Can Trans Mountain provide readable versions?

**IIIbvii** Trans Mountain refer to various options to address the potential to experience groundwater discharge in open excavations by intersecting the water table with mitigations listed including installing sub-drains/diversion of shallow ground water and reference more details in Section 8.4. Section 8.4 was not found in your application. We request a contextual reference, document name and web link to your reference “Section 8.4”. It is important to understand what you intend if diverting or draining water in the Sardis-Vedder aquifer is required as mitigation and request specific details on that process including scope and water volumes.

**IIIbviii** What is Trans Mountain's detailed safe guards/preventative plan? Spilling these chemicals in our BC water resource will not be an option. Please provide projected quantities of these fluids, chemicals and other toxins projected that will be on site with particular reference to aquifers, rivers, streams, sloughs and inclusive of all sites where water is present. Has Trans Mountain done seismic assessments?

**IIIbix** In the application it is noted that there is little chance of an earthquake along the pipeline in the Fraser Valley. This is contrary to a study done in Washington State which discusses both earthquakes in the area and liquefaction. In the 2005 spill the pipeline cracked due to a slight shift in a landfill sight combined with a bend in the pipeline. What spill prevention measures have you taken to ensure that either blasting from the Sumas Mountain quarry blasting or an earthquake happen?

**IIIbx** How many more incidents in the Mar. 14 2014 Kinder Morgan Integrity Assessment KMC Integrity EA-TM-2014-004 will be documented as "reportable incidents" such as those in the NEB report (Ref IIIaii) 2000 to 2012?

## **IV Local Risks from Extreme Weather Due to Climate Change**

### **References**

**Ivi** Letter dated April 2, 2014 from Board to Mr. Stoness (Kinder Morgan Canada) and Mr. Denstedt Q.C. (Osler, Hoskin & Harcourt LLP) : Hearing Order OH-001-2014 Trans Mountain Pipeline ULC (Trans Mountain) Application for the Trans Mountain Expansion Project dated 16 December 2013 Factors and Scope of the Factors for the Environmental Assessment pursuant to the Canadian Environmental Assessment Act, 2012 (CEAA 2012) Subsection 2(1) of the CEAA 2012 *Factors and Scope of the Factors for the Environmental Assessment pursuant to the Canadian Environmental Assessment Act, 2012* page 4

"As indicated above, the environmental assessment will consider cumulative environmental effects that are likely to result from the designated project in combination with effects from other physical activities that have been or will be carried out.

Subsection 2(1) of the CEAA 2012 provides definitions potentially relevant to the scope of the factors, including:

"environment" which means the components of the Earth, including

(a) land, water and air, including all layers of the atmosphere; (b) all organic and inorganic matter and living organisms; and (c) the interacting natural systems that include components referred to in paragraphs (a) and (b);

and

"mitigation measures" which means measures for the elimination, reduction or control of the adverse environmental effects of a designated project, and includes restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means."

**IVaii** *Former mayors call for better flood mitigation* July 2013

<http://www.theprogress.com/news/214213771.html> What is needed is better threat assessment studies, more dike upgrades, and more efforts to protect the bridges, highways, power lines, railway lines, and pipelines that crisscross the region. Former Abbotsford Mayor George Ferguson said he remembered the devastation of the Flood of 1948, when it took three months just to get the power going again. "Today if we don't have power, we're dead," he said, adding the pumps wouldn't work to pull the water away. They're not pointing destructive power of the mighty Fraser River. "**Calgary should serve as a bit of a wake up call for all of us,**" he said. After former Kent Mayor Sylvia Pranger volunteered in the wake of the Red River flooding in Manitoba, and it changed her profoundly. "I vowed I would never stop fighting for better flood protection here," she said. **(my emphasis)**

**IVaiii** Mayerthorpe Freelancer *Alberta Agriculture helps producers with flooding* July 2013

<http://www.mayerthorpefreelancer.com/2013/07/02/alberta-agriculture-helps-producers-with-flooding>

"Alberta Agriculture is currently working with producers to assess the impact of flooding in southern Alberta and will also be helping with recovery.....

Beef processors to reopen soon. Cargill Meat Solutions, one of Alberta's largest beef processors, could be back in production sooner than expected, thanks to some innovative thinking and some help from the Redford government. "High River has been **devastated by last week's floods**. Today we took steps to get emergency funds into people's hands and to fund important infrastructure repair in the Town so the people of High River can begin to return home in the days ahead,

**IVaiv** CBC April 29, 2014 *Pipeline push-back: What's behind the rising opposition to Canada's big oil pipelines* <http://www.cbc.ca/news/business/pipeline-push-back-what-s-behind-the-rising-opposition-to-canada-s-big-oil-pipelines-1.2619646>

"Now, a few years later, he notes, there's a section of the U.S. environmental impact statement on Keystone XL devoted to the greenhouse gas output of increased oilsands production, and President Barack Obama says the key factor determining the project's fate is whether it's going to increase greenhouse gas emissions because of increased oilsands production."

The Toronto Star April 14, 2014, *Canadian economy will lose billions to climate change*

[http://www.thestar.com/business/economy/2014/04/14/canadian\\_economy\\_will\\_lose\\_billions\\_to\\_climate\\_change\\_report.html](http://www.thestar.com/business/economy/2014/04/14/canadian_economy_will_lose_billions_to_climate_change_report.html)

"A new report on the financial implications of climate change notes that while natural catastrophes are estimated to cost Canadians \$21-\$43 billion per year by 2050, popular economic measures like GDP fail to capture the escalation, discouraging preventative investment.

The TD report follows a recent and alarming warning by the United Nations Intergovernmental Panel on Climate Change that [governments are ill-prepared for a warming world](#). If action is not immediately taken, the UN report projected risks could become unmanageable

Monday's report detailed the Canadian perspective on increasingly frequent natural catastrophes — the average number per year has doubled over the past three decades — and how by 2020 they will sap an estimated \$5 billion from the economy.

“The reality is that the frequency of weather events has increased,” said lead author and TD economist Craig Alexander. “Storms that used to occur every forty years are now occurring every six years. And because of the composition of Canadian economy and society, we’re ending up with more damaging events.”

**IVav** City of Abbotsford report COR 40-2014

<https://abbotsford.civicweb.net/Documents/DocumentList.aspx?ID=40085> “A property value tax, as prescribed in the bylaw, is levied on every owner of property within the Sumas Prairie 001 District, based on assessed value. Drainage and irrigation parcel taxes are imposed on those owners in designated drainage and irrigation zones based on acreage. Taxes are levied to cover the operational and capital costs of \$1.396 million for 2014 (\$1.406 million for 2013) associated with operating and maintaining the dyking, drainage and irrigation system.”

The 2014 budget was presented to the Sumas Prairie Dyking, Drainage and Irrigation Committee. The committee's parcel tax rate recommendation was incorporated into the budget presented to Council and was approved and included in the City's 2014 Consolidated Financial Plan.

**IVavi** Letter dated Mar. 18, 2014 from Greg Toth Kinder Morgan Trans Mountain submitted to the Fraser Valley Regional District / public at the FVRD Committee of the Whole on Mar. 19, 2014.

“On December 16, 2013, Kinder Morgan Canada/Trans Mountain Pipelines filed its Facilities Application with its regulator, the National Energy Board (NEB) for the proposed Trans Mountain Expansion Project. This application filing follows over a year and a half of engagement with pipeline and marine communities, a detailed environmental and socio-economic assessment, route assessments, and other various marine and terrestrial risk analyses and studies.

## 5. Mitigating for climate change

5.1. Climate change could have a detrimental effect on the drainage of agricultural lands in the eastern Fraser Valley, requiring more substantial diking and drainage infrastructure as tidal influences move eastward up the Fraser River. Will the pipeline construction and design take into account long term drainage infrastructure requirements?

Building of dikes above the pipeline is unlikely to cause issues from the extra over burden and would have to be assessed at that time. Of more concern is new drainages reducing cover on the pipeline or being exposed. Individual farmers and irrigation districts will be consulted on farming practices and future plans and this will be accommodated in some cases with extra cover depth in some locations. In the future, if unanticipated drainages are required across the pipeline and it reduces the cover depth below the minimum depth specified in Canadian Standards Association, CSA Z662 Oil & Gas Pipeline Systems, it is technically possible to lower the pipeline to a greater depth while it is in service (line is shut down at the time).”

**IVavii** *Climate Change Impacts in the United States CHAPTER 21 NORTHWEST*

<http://nca2014.globalchange.gov/report/regions/northwest> “The ability to adapt to climate changes is strengthened by extensive water resources infrastructure, diversity of institutional arrangements,<sup>43</sup> and

management agencies that are responsive to scientific input. However, over-allocation of existing water supply, conflicting objectives, limited management flexibility caused by rigid water allocation and operating rules, and other institutional barriers to changing operations continue to limit progress towards adaptation in many parts of the Columbia River basin.<sup>44,45</sup> Vulnerability to projected changes in snowmelt timing is probably highest in basins with the largest hydrologic response to warming and lowest management flexibility – that is, fully allocated, mid-elevation, temperature-sensitive, mixed rain-snow watersheds with existing conflicts among users of summer water. Regional power planners have expressed concerns over the existing hydroelectric system’s potential inability to provide adequate summer electricity given the combination of climate change, demand growth, and operating constraints.<sup>46</sup> Vulnerability is probably lowest where hydrologic change is likely to be smallest (in rain-dominant basins) and where institutional arrangements are simple and current natural and human demands rarely exceed current water availability.”

*Climate Change Impacts in the United States CHAPTER 21 NORTHWEST*

<http://nca2014.globalchange.gov/report/regions/northwest> Pages 4-5 “Changes in river-related flood risk depends on many factors, but warming is projected to increase flood risk the most in mixed basins (those with both winter rainfall and late spring snowmelt-related runoff peaks) and remain largely unchanged in snow-dominant basins.<sup>27</sup> Regional climate models project increases of 0% to 20% in extreme daily precipitation, depending on location and definition of “extreme” (for example, annual wettest day).

Averaged over the region, the number of days with more than one inch of precipitation is projected to increase 13% in 2041 to 2070 compared with 1971 to 2000 under a scenario that assumes a continuation of current rising emissions trends (A2),<sup>10</sup> though these projections are not consistent across models.<sup>28</sup> This increase in heavy downpours could increase flood risk in mixed rain-snow and rain-dominant basins, and could also increase stormwater management challenges in urban areas.

Consequences and Likelihoods of Changes Reservoir systems have multiple objectives, including irrigation, municipal and industrial use, hydropower production, flood control, and preservation of habitat for aquatic species. Modeling studies indicate, with near 100% likelihood and for all emissions scenarios, that reductions in summer flow will occur by 2050 in basins with significant snowmelt (for example, Elsner et al. 2010<sup>24</sup>)”

**IVaviii** Natural Resources Canada datasets <http://www.earthquakescanada.nrcan.gc.ca/recent/index-eng.php> 70 earthquakes March 2014 – some in the Fraser Valley

**IVaix** Ministry of Forests, Lands and Natural Resource Operations Flood Safety Section draft copy of February 2014 draft copy of “Seismic Design Guidelines for Dikes, 2<sup>nd</sup> Edition” following due diligence to protect Fraser Valley dyke system.  
[http://www.env.gov.bc.ca/wsd/public\\_safety/flood/pdfs\\_word/seismic\\_guidelines\\_dikes-2014.pdf](http://www.env.gov.bc.ca/wsd/public_safety/flood/pdfs_word/seismic_guidelines_dikes-2014.pdf)

**IVax** Department of Agriculture Map of soil type in the Sumas Vedder Mountain area  
<http://sis.agr.gc.ca/cansis/publications/surveys/bc/bc1/index.html>

**IVaxi** Application Volume 5C 1 of 17 Page. 4.4, TABLE 4.1.1 item 7

**IVaxii** Glacial retreat affecting ground water. <https://www.nichols.edu/departments/glacier/Bill.htm>

### **Preamble**

Most farms in proximity of the proposed pipeline expansion ROW in Chilliwack, Abbotsford and Langley are on flood plains.

### **Information Request based on the above noted references**

**IVbi** How deep is the current Trans Mountain Pipeline through Hope, Chilliwack, Abbotsford, Langley, and Surrey?

**IVbii** Will Trans Mountain contribute to the dyking and drainage funds of the above noted local governments?

**IVbiii** Has Trans Mountain considered a deeper right of way throughout the above noted areas? If not why not?

**IVbiv** Has Trans Mountain considered the impact of their pipeline on irrigation ditches that are essential for agricultural crops in the above noted areas?

**IVbv** What mitigation measures does Trans Mountain propose in the event that their current and proposed expansion prevents farmers from irrigating their crops from irrigation ditches?

**IVbvi** Please explain what Trans Mountain mean when by “contaminated” when referring to “shallow aquifer”. Is this referring to anticipated 60 year old pipe being compromised in some way and this condition being revealed as Trans Mountain excavate to put down the twin pipe? Or does this refer to possible pipe damage during construction or something else entirely? We request Trans Mountain provide known and detailed status of the condition of the current pipe in the ground for all pipe line sections starting at Hope, BC through and including Langley, BC. Please provide a detailed analysis, including the last time a pig” was through the pipe to inspect it.

## **V Purported Economic Benefits for Local Communities / B.C. / Canada**

### **References**

**Vi** Journal Resource and Energy Economics. “The wealth in one sector has been a disaster for the overall Canadian economy, according to another recent study. Up to 45 percent of job losses in Canada's manufacturing sector can be attributed to what economists call “Dutch Disease,” wrote authors from Canada and Europe in a peer-reviewed published November 2012 in the journal Resource and Energy Economics <http://ec.gc.ca/ges-ghq/default.asp?lang=En&n=F81C9414-1&offset=3&toc=show#table1>

“Dutch Disease refers to the many examples where an increase in exploitation of natural resources coincides with a decline in the manufacturing sector. It was first documented in the Netherlands during its North Sea oil boom in the 1960s.

Canada's energy wealth has also exacerbated income inequality by spurring the cost of goods and services and making Canadian exports more expensive. Ten years ago, the Canadian dollar was worth about 65 cents on the US dollar. In recent years, the Canadian dollar has been on par with the US dollar, or even exceeded it in value.

The study in Resource and Energy Economics found that the “Canadian currency has been driven up by the prices of commodities.” As the Canadian currency gained strength, more than a half-million manufacturing jobs have been lost since 2000. In 2011 Canada lost industrial plants at twice the pace of the United States.”

*Vii Feds fund “Dutch Disease” research* <http://www.plant.ca/sustainability/feds-fund-dutch-disease-research-64330/> The paper, “Does the Canadian Economy Suffer from Dutch Disease?,” concludes that a third or more of job losses in Canada’s manufacturing sector can be attributed to resource-driven currency appreciation.

“We show that between 33 and 39% of the manufacturing employment loss that was due to exchange rate developments between 2002 and 2007 is related to the Dutch Disease phenomenon,” the study says.

The research, more than 18 months in the making, was carried out in part by Serge Coulombe, an economics professor at the University of Ottawa, who says Industry Canada was highly supportive of his work.

“At the time, they were interested in knowing about the issue,” he said in an interview, noting the final paper was subject to a “very deep external refereeing process.”

“This paper has been presented at Industry Canada ... and they have helped us assemble the database.”

*Vaii How Obama Shocked Harper as Keystone's Frustrator-in-Chief* Bloomberg Apr 25, 2014, “Western Canada’s land-locked Alberta oil sands hold roughly 168 billion recoverable barrels of heavy crude known as bitumen. America gobbles up almost all of Canada’s oil exports. An energy [research group](#) in Calgary had run the math: If Keystone died, it could cost Canada C\$632 billion (\$573 billion) in foregone growth over 25 years -- **94 percent of it from the economy of Alberta,**” **(my emphasis)** <http://www.bloomberg.com/news/2014-04-24/how-obama-shocked-harper-as-keystone-frustrator-in-chief.html>

“Prior to the shale and tight oil boom in the US and significant expansion of oil sands in Canada, the US and Canadian system for delivering crude oil to market was stable and relatively predictable. In general, the US and Canadian crude oil pipeline networks were originally designed for taking crude oil into the

US Midwest. Then matters started to change as production close parity with Brent, started to disconnect. Discounts deepened, affecting essentially all inland lower-48 crude grades, as well as Canadian crude oils (since these are also priced off WTI). Since January 2011, these discounts have been steep and have been considered 'structural'

**Va**iii MacLeans Magazine *Canada the failed petrostate*, Nov 2013  
<http://www2.macleans.ca/2013/11/04/canada-the-failed-petrostate/>

"I've taken to opening most public talks I give with a question: What is the share of oil and gas extraction in Canada's GDP? I get a wide range of answers, generally in a range from 5-40%. The high numbers, in the 30s and 40s, tend to come both from the industry's staunchest opponents and from those occupying the corporate towers of Calgary.

So, what do the data say? The data tell you that the energy share and oil and gas share of Canada's GDP is dropping, that the growth in the energy sector has accounted for a much smaller share of Canada's economic growth than most people seem to imagine, and that the oil and gas share of total corporate taxes paid in Canada is smaller than its GDP share. The data also show little to no evidence of a Harper-effect. Let's look at each of these in turn.

First, the GDP shares. Since 1997, the energy sector share of Canada's GDP has declined – yes, declined – from over 12% to less than 10%. Over that same time period, oil and gas extraction has also declined slightly, from just over 7% to just over 6%. Data on unconventional oil extraction are not available over this entire timespan, but between January 2007 and August 2013, that subsector (**which includes oil sands**) **increased from 1.3% of GDP to 2.0%** in the most recent data available—rapid growth to be sure, at 7.5% per year, but on a small base." (**my emphasis**)

**Va**iv Statistics Canada data:

<http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3790031&paSer=&pattern=&stByVal=1&p1=1&p2=31&tabMode=dataTable&csid=>

<http://www.statcan.gc.ca/daily-quotidien/130426/dq130426a-eng.htm>

**Va**v Cenovus Energy News Release Sept 4, 2012, Cenovus achieves first production at Christina Lake expansion <http://www.cenovus.com/news/news-releases/2012/0904-christina-lake-first-prod.html>

"Construction continues on phase E, the next expansion at Christina Lake, and is currently ahead of schedule. The phase is about 55% complete, with initial production anticipated for the fourth quarter of 2013. Site preparation, engineering and major equipment fabrication is underway for Christina Lake phase F with first production expected in 2016.

The company plans to provide an update to full-year production forecasts with its third quarter results in October"

#### ADVISORY

#### FORWARD-LOOKING INFORMATION

This news release contains certain forward-looking statements and other information (collectively "forward-looking information") about our current expectations, estimates and projections, made in light of our experience and perception of historical trends. Forward-looking information in this news release is identified by words such as "anticipate", "believe", "expect", "plan", "forecast", "target", "project",

“could”, “focus”, “vision”, “goal”, “proposed”, “scheduled”, “outlook”, “potential”, “may”, “looking forward to”, or similar expressions and includes suggestions of future outcomes, including statements about our growth strategy and related schedules, projected future value or net asset value, forecast operating and financial results, planned capital expenditures, expected future production, including the timing, stability or growth thereof, expected future refining capacity, anticipated finding and development costs, expected reserves and contingent and prospective resources estimates, potential dividends and dividend growth strategy, anticipated timelines for future regulatory, partner or internal approvals, future impact of regulatory measures, forecasted commodity prices, future use and development of technology, **including technology and procedures to reduce our environmental impact**, and projected increasing shareholder value. **Readers are cautioned not to place undue reliance on forward-looking information as our actual results may differ materially from those expressed or implied.**

**Developing forward-looking information involves reliance on a number of assumptions and consideration of certain risks and uncertainties, some of which are specific to Cenovus and others that apply to the industry generally. . (my emphasis)**

The factors or assumptions on which the forward-looking information is based include: assumptions inherent in our current guidance, available at [www.cenovus.com](http://www.cenovus.com); our projected capital investment levels, the flexibility of our capital spending plans and the associated source of funding; the estimation of quantities of oil, bitumen, natural gas and liquids from properties and other sources not currently classified as proved; our ability to obtain necessary regulatory and partner approvals; the successful and timely implementation of capital projects or stages thereof; our ability to generate sufficient cash flow from operations to meet our current and future obligations; and other risks and uncertainties described from time to time in the filings we make with securities regulatory authorities.

The risk factors and uncertainties that could cause our actual results to differ materially, include: volatility of and assumptions regarding oil and gas prices; the effectiveness of our risk management program, including the impact of derivative financial instruments and the success of our hedging strategies; accuracy of cost estimates; fluctuations in commodity prices, currency and interest rates; fluctuations in product supply and demand; market competition, including from alternative energy sources; risks inherent in our marketing operations, including credit risks; maintaining desirable ratios of debt to adjusted EBITDA as well as debt to capitalization; our ability to access various sources of debt and equity capital; accuracy of our reserves, resources and future production estimates; our ability to replace and expand oil and gas reserves; our ability to maintain our relationship with our partners and to successfully manage and operate our integrated heavy oil business; reliability of our assets; potential disruption or unexpected technical difficulties in developing new products and manufacturing processes; refining and marketing margins; potential failure of new products to achieve acceptance in the market; unexpected cost increases or technical difficulties in constructing or modifying manufacturing or refining facilities; unexpected difficulties in producing, transporting or refining of crude oil into petroleum and chemical products; risks associated with technology and its application to our business; the timing and the costs of well and pipeline construction; our ability to secure adequate product transportation; changes in the regulatory framework in any of the locations in which we operate, including changes to the regulatory approval process and land-use designations, royalty, tax, **environmental, greenhouse gas, carbon and other laws or regulations, or changes to the interpretation of such laws and regulations**, as adopted or proposed, the impact thereof and the costs associated with compliance; the expected impact and timing of various accounting pronouncements, rule changes and standards on our business, our financial results and our consolidated financial statements; changes in the general economic, market and business conditions; the political and economic conditions in the countries in which we operate; the occurrence of

unexpected events such as war, terrorist threats and the instability resulting therefrom; and risks associated with existing and potential future lawsuits and regulatory actions against us.” (my emphasis)

**Vavi** Conversations for Responsible Economic Development (CRED) *Fuelling BC’s economy: where does our wealth come from?* Source: *The 2012 British Columbia Economic Accounts, BC Stats* “Oil, gas and support services make up just 3% of our GDP, compared to 15% for manufacturing and construction and over 23% for financial and real estate services. When secondary energy services are added into the equation, the total contribution to GDP is still only 11%. While this number is significant, it’s certainly not where most provincial economic activity is coming from.”

“Who funds social programs? Although BC Stats doesn’t gather data on the tax contributions of different sectors, StatsCan makes this information available on a national level. In total, the oil and gas sector (oil sands plus conventional oil and gas) contributes 4.2% of corporate GDP.” <http://credbc.ca/role-energy-sector-bcs-economy/>

**Vaviii** Conference Board of Canada *Beer Industry Boosts The Canadian Economy*

[http://www.conferenceboard.ca/press/newsrelease/13-11-05/beer industry boosts the canadian economy.aspx](http://www.conferenceboard.ca/press/newsrelease/13-11-05/beer%20industry%20boosts%20the%20canadian%20economy.aspx)

“British Columbia has 72 breweries, second only to Ontario. Almost 19,000 jobs in B.C. and the three territories are due to beer consumption locally and across Canada.”

**Vaix** International Monetary Fund, Feb 2014 “A one percent of (national) GDP investment in the energy sector in Alberta will boost Canada’s GDP by 0.9 percent, of which 0.82 percent of GDP will be in Alberta itself. ”

**Table A4. Estimated GDP Multipliers: Disaggregated Provincial and the U.S.  
Input-Output Model, 2009**

From \ To	Alberta				Ontario				United States			
	Energy	Manuf.	Agric.	Other	Energy	Manuf.	Agric.	Other	Energy	Manuf.	Agric.	Other
<b>Alberta</b>												
Energy	0.67	0.13	0.04	0.02	0.01	0.01	0.01	0.00	0.04	0.00	0.00	0.00
Manuf.	0.02	0.37	0.08	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Agric.	0.00	0.02	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.13	0.13	0.20	0.12	0.01	0.02	0.01	0.01	0.03	0.00	0.00	0.00
<b>Ontario</b>												
Energy	0.00	0.00	0.00	0.00	0.64	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Manuf.	0.01	0.01	0.01	0.00	0.03	0.37	0.08	0.02	0.00	0.00	0.00	0.00
Agric.	0.00	0.00	0.00	0.00	0.00	0.01	0.37	0.00	0.00	0.00	0.00	0.00
Other	0.03	0.04	0.04	0.02	0.15	0.13	0.21	0.82	0.01	0.00	0.00	0.00
<b>Other Canada</b>												
Energy	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00
Manuf.	0.01	0.02	0.04	0.01	0.01	0.02	0.02	0.01	0.01	0.00	0.00	0.00
Agric.	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.02	0.06	0.08	0.05	0.02	0.04	0.04	0.02	0.01	0.00	0.00	0.00
<b>United States</b>												
Energy	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.67	0.04	0.01	0.00
Manuf.	0.01	0.02	0.02	0.01	0.03	0.10	0.06	0.03	0.06	0.53	0.12	0.04
Agric.	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.51	0.00
Other	0.01	0.01	0.01	0.01	0.02	0.06	0.04	0.02	0.21	0.24	0.25	0.90
<b>Canada - Total</b>	0.90	0.80	0.81	0.34	0.88	0.63	0.77	0.89	0.14	0.02	0.02	0.00
<b>United States - Total</b>	0.02	0.04	0.04	0.02	0.06	0.18	0.11	0.05	0.94	0.83	0.90	0.95

Source: IMF staff estimates.

**Vax** The Prince George Citizen April 29, 2014, *Enbridge excluding tradespeople*

<http://www.princegeorgecitizen.com/opinion/letters/enbridge-excluding-tradespeople-1.1006923>

“Rather than include most British Columbian tradespeople, the MOU effectively excludes 80 per cent of those who work outside of the old union system. Enbridge neglected to notice that projects like the Port Mann Bridge, Sea-to-Sky highway, the 2010 Olympics, the Canada Line and virtually every other project in B.C. encouraged everyone to participate and work side by side regardless of their affiliation by not signing anything that restricted who can work. If this is their approach to building a pipeline in B.C., unfortunately they will continue to encounter opposition to the project in communities across our province.”

**Vaxi** Vancouver Observer, April 28, 2014 *Don't build a pipeline, build a new economic model*

<http://www.vancouverobserver.com/opinion/don-t-build-pipeline-build-new-economic-model>

“Janet Gray from BC-Yukon KAIROS, a faith-based organization working towards social and ecological justice, argues for a new model to govern the province. In our current economic model, companies and shareholders' returns are perceived to matter more than the land that sustains all life. After hearing over 1,000 submissions arguing that the Northern Gateway pipeline is simply not worth the risk to BC's jobs, communities, climate and natural environment, the panel ruled that “the project's potential benefits for Canada and Canadians outweigh the potential burdens and risk.” A new economy for Canada can be based on what sustains life and protects diversity. An economic model reliant on the destruction of wilderness is unsustainable and short-sighted. We must instead begin investing in alternative energy technologies and build the infrastructure to support them.”

**Vaxii** INCENTIVE TOLL SETTLEMENT Appendix 7 Calculation of Individual Non-Routine Adjustments Page 40 <https://docs.neb-one.gc.ca/ll-eng/llisapi.dll?func=ll&objId=552917&objAction=browse&viewType=1>

Environmental Remediation costs The following NRA costs are summarized on Appendix 7.7 and described below: ..... Sumas Spill Costs - final insurance settlement In July 2005 a failure of the Sumas 20” tank transfer line resulted in the release of 210m<sup>3</sup> of crude oil near Abbotsford,BC. The investigation concluded that the pipe failure, which occurred in a peat bog resulted from soil displacement initiated by the placement of a nearby landfill. Cleanup of the contaminated soil and waterways is complete and remaining environmental restoration was completed by the end of 2006. The incident was under active investigation by the Transportation Safety Board and NEB staff was aware of the incident. **An estimated \$1.0MM was expensed in 2005 and recovered from Shippers.**

The total area remediated was 14,300 m<sup>3</sup>. The crude oil entered a water course which supplies flow and nutrients for downstream fish bearing waterways. Approximately 5,150 m<sup>3</sup> of organic (peat) soil was removed from the wetland area during the remediation activities. Post accident and soil and water sampling indicated that the site was substantially remediated. **final insurance claims were settled in January 2009** with a return recoverable amount of \$1.7MM. Under the terms of the 2001 ITS, these amounts are recoverable (additional note: the 2005 toll filing indicated that the settlement was not finalized.)

**Vaxiii** Application Appendix G *Potential Cleanup and Damage Costs of a Hypothetical Oil Spill: Assessment of Trans Mountain Expansion Project* Page 14” All other things equal, unit spill costs are higher for heavy oils, for impacts on water, for remote locations, and for manual cleanup techniques; also economy of scale in cleanup are realized such that larger spills tend to have lower unit cleanup costs. Annex B summarizes the resultant ranges from combining assumptions, and the algorithm provides a transparent means for estimating costs. It indicates that for reference conditions (representing light oils, inexpensive mechanical cleanup, no impacts on water or shorelines, and readily accessible spill sites), the cost range is from \$553/bbl to \$7,372/bbl, with the highest costs associated with small spills (<240 bbl) and the lowest unit costs associated with larger spills (>12,000 bbl). For heavy oils spilled at remote sites impacting waterways and 100 km of shorelines or estuaries, these costs would increase by a factor of 3.38: the adjusted value for a larger spill would be \$1,869/bbl”

**Vaxiv** Part IV toll application Facility Support Agreement (Clause 12.5 Page 25 [https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90465/92835/552980/820467/861606/A3A014\\_-Letter to NEB re Revised Section 2.2 of FSA?nodeid=861361&vernum=0](https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90465/92835/552980/820467/861606/A3A014_-Letter%20to%20NEB%20re%20Revised%20Section%202.2%20of%20FSA?nodeid=861361&vernum=0))

**Vaxv** Testimony from the Enbridge Northern Gateway Part III Hearings regarding insurance / letter of credit / bond in the event of a spill

Northern Gateway Pipelines Inc. Enbridge Northern Gateway Project Application of 27 May 2010  
Demande de Northern Gateway Pipelines Inc. du 27 mai 2010 relative au projet Enbridge Northern Gateway

VOLUME 72 Hearing held at Holiday Inn Conference Centre 4485 Gateway Blvd. Edmonton, Alberta

**Sept. 7, 2012**

18273. **Now, this particular per barrel cost that you’ve cited, which was I think of the order of \$14,000 per barrel, does include two elements: One is the cleanup cost, indeed, and the other is a less certain area of environmental and social damages.**

[https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/628981/859451/International\\_Reporting\\_Inc.\\_-Vol.72-FriSep07.12\\_-A2Z9H9?nodeid=859369&vernum=0](https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/628981/859451/International_Reporting_Inc._-Vol.72-FriSep07.12_-A2Z9H9?nodeid=859369&vernum=0)

Sept 18, 2012

**23190. MS. BOYE: And could you tell me what the estimated premiums would be if you were to obtain policies with coverage limits of 500 million, 1 billion, 1.5 billion and 2 billion?**

**23191. MR. JOHN CARRUTHERS: No I could not.**

**23192. That wouldn’t be -- at this point, that wouldn’t be informative. You would first need to -- again, you would need to have a firm understanding of what the potential consequences is and the risk of that.**

**23193. And that isn’t able to be determined yet because we haven’t finished our complete design of the – the detailed design we haven’t gone through. We don’t know what conditions might be imposed by the Joint Review Panel.**

23194. And so there is a number of things that will go to inform the appropriate level of insurance.

23195. MS. BOYE: Are you suggesting that that information is not able to be provided as an estimate from your broker at this point?

**23196. MR. JOHN CARRUTHERS: The broker would not have sufficient information to make an informed decision about that; again, one that we would find credible at this point.**

23197. We did speak to the broker again to confirm that we -- the expectation is that we could obtain third-party insurance. So that was the conversation that we had with our broker to confirm that.

[https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/628981/863264/International\\_Reporting\\_Inc.-\\_Vol.75-TueSep18.12\\_-\\_A3A2F3?nodeid=863098&vernum=0](https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/628981/863264/International_Reporting_Inc.-_Vol.75-TueSep18.12_-_A3A2F3?nodeid=863098&vernum=0)

**Sept. 21**

27027. **MR. JOHN CARRUTHERS: Yes, my assumption was that there would be -- you'd have insurance, you'd have cash flow and you'd have potential financing and potential increase in tolls available to finance any spills above the insurance.**

27095. **So clearly when Enbridge looked at it they said -- I guess theoretically you could have put up \$500 million in terms of a bond and not spent it but it was felt to be the better form of insurance, for the pipeline, was to ensure an accident didn't happen.**

[https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/628981/864952/International\\_Reporting\\_Inc.-\\_Vol.78-FriSep21.12\\_-\\_A3A3Q6?nodeid=865074&vernum=0](https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/628981/864952/International_Reporting_Inc.-_Vol.78-FriSep21.12_-_A3A3Q6?nodeid=865074&vernum=0) **(my emphasis)**

**Vaxvi** B.C. Minister of Environment briefing note MOE-2013—163 Page 5

<http://www.openinfo.gov.bc.ca/ibc/search/detail.page?config=ibc&P110=recorduid:4607646&title=FOI%20Request%20-%20MOE-2013-00163>

- The severity of a spill from the Northern Gateway pipelines would depend on the spill location and size. For example, at a rate of 500,000 barrels of crude oil per day, a pipeline spill lasting an hour could lead to 21,000 barrels spilling into B.C.'s wilderness. There are

### **Preamble**

Your application asserts that this project will bring significant economic benefits to all of Canada. The references above do not support your assertions. One of your shippers Cenovus has cautioned potential investors and shareholders with regard to "Forward Looking" estimates. It appears that there is little to no mention of the risks to the income of shippers in the application which would impact taxes and royalties and other purported economic benefits. You also appear to downplay costs for spill remediation costs.

### **Information Request based on the above noted references**

**Vbi** Your application asserts that for a terrestrial spill the "cost range is from \$553/bbl to \$7,372/bbl, with the highest costs associated with small spills (<240 bbl) and the lowest unit costs associated with larger

spills (>12,000 bbl). For heavy oils spilled at remote sites impacting waterways and 100 km of shorelines or estuaries, these costs would increase by a factor of 3.38: the adjusted value for a larger spill would be \$1,869/bbl” while the sworn testimony in the Enbridge Northern Gateway hearing indicates a \$14,000 per barrel cost. Why the discrepancy between the two? Upon which data expert reports do you base your estimates?

**Vbii** What was the per barrel environmental remediation cost for the 2005 “Sumas spill”?

**Vbiii** What was the cost per barrel for each of the 19 “reportable Incidents” from 2000 to 2012  
<https://www.documentcloud.org/documents/812378-neb-pipeline-incidents-2000-2012-part-1.html>?

**Vbiv** Kinder Morgan Trans Mountain staff have asserted that they do not need to have \$1billion in insurance as the parent company has enough to cover any spill liabilities. Why was it necessary for Kinder Morgan Trans Mountain “Shippers” to pay for the costs of remediation of the 2005 “Sumas spill” which cost \$5.09 million to remediate?

**Vbv** Why did it take 4 years to settle the insurance claims? Is this the usual duration to pay all remediation costs?

**Vbvi** What is the minimum percentage of British Columbia’s GDP can Kinder Morgan Trans Mountain guarantee this project be worth once pipeline construction is completed – excluding upstream and downstream financial benefits?

**Vbvii** What is the minimum percentage of Canada’s GDP can Kinder Morgan Trans Mountain guarantee this project be worth once pipeline / construction is complete – excluding upstream and downstream financial benefits?

**Vbviii** How many permanent jobs will there be in B.C. once the construction phase of this project is complete? What is the gross project annual income from the permanent jobs once the construction phase is complete?

**Vbix** Has Kinder Morgan Trans Mountain entered into any contracts with local contractors to construct the pipeline expansion or have they done what Enbridge is doing and signing agreements with large out of province / country construction firms?

**Vbx** Will Kinder Morgan Trans Mountain formally commit to not using temporary foreign workers or out of province workers? If so why is there the need for “camps” as indicated in the application?

## **VI Risks to Agriculture and Food Security**

### **References**

**Viai** Application “6.3.1 Economy Pipeline spills can have both positive and negative effects on local and regional economies, both in the short and long term. Spill response and clean-up creates business and employment opportunities for affected communities, regions, and clean-up service providers. This demand for services and personnel can also directly or indirectly affect businesses and resource-dependant livelihoods. The net overall effect depends on the size and extent of a spill, the associated demand for clean-up services and personnel, the capacity of local and regional businesses to meet this demand, the willingness of local businesses and residents to pursue response opportunities, the extent

of business and livelihoods adversely affected (directly or indirectly) by the spill, and the duration and extent of spill response and clean-up activities. Evidence from past incidents shows that economic activities would be affected if a large spill were to directly affect an HCA such as a community or water body. The magnitude of effects resulting from a small spill on land would be smaller.

6.3.1.1 Potential Economic Effects on Agriculture and Forestry The pipeline industry and regulators have developed standardized approaches to avoid or minimize the long-term effects of land-based spills on landowners and resource tenure holders. Hydrocarbon exposure to soil could result in soil contamination because of changes in physical, chemical and biological properties that could lead to deterioration of surface soil. During spill response and remediation activities, efforts are made to avoid impacts by restricting movement of livestock and planting or harvesting in the affected area. Emergency response activities themselves can have secondary effects such as admixing, compaction and rutting, erosion and loss, and changes in moisture of soil, although the overall goal of response activities is to minimize adverse effects

The NEB has published a Remediation Process Guide (NEB 2011) to aid companies in the event of a spill. Upon detection, the company must report the spill to the NEB and all applicable regulators (e.g., the Transportation Safety Board and provincial or territorial authorities). The company is then required to complete an Environmental Site Assessment and, if remediation is required, a Remedial Action Plan. The most stringent clean-up criteria must be used for remediation of soil and groundwater (i.e., the lower of provincial, territorial, or other limits developed by the CCME), and the site is considered clean once the NEB approves the Remediation Closure Report, which demonstrates that all applicable standards have been met. Although the Project will be regulated by the NEB, the involvement of other regulators, including provincial and municipal regulatory authorities, may be required depending on the applicable provincial and municipal legislation and regulatory requirements, circumstances of the spill and site location. For example, in BC, schedules contained in the Contaminated Sites Regulation (CSR) define the numerical standards for soil, water, vapour, and sediment that are used to determine if a site is contaminated. Following that determination, a site owner/operator has the option of either cleaning up to the numerical standards listed in the Schedules or cleaning up to risk-based (site-specific) standards (BC MOE 2009). Soils along the pipeline route include agricultural soils and a range of non-agricultural soils, including wetlands and river sediments. Regardless of soil type, hydrocarbons in mineral or organic soil could affect vegetation and soil productivity. In non-agricultural areas, changes in soil quality related to contamination are assessed by comparison with CCME regulatory guidelines for hydrocarbons in soil and requirements for soil remediation, based on land use (CCME 2008). As noted above, appropriate provincial criteria may also apply. On agricultural land, or most types of non-agricultural land, hydrocarbons are adsorbed by soil or spread into the environment. The amount of adsorption or spreading is influenced by:

- the physical state of the soil (including texture and bulk density);
- the soil's cation exchange capacity;
- the soil's organic matter content; and
- the depth to restricting layers.

Clean-up and remediation is designed to return the affected area to baseline soil capability or quality. Prior agricultural or other land use can be restored in the short to medium term. Residual contaminated soils can be remediated in five years offsite, although the timeline varies based on the type of remediation, soil type, moisture content, level of soil contamination and other factors (Bailey and McGill 2001). Contamination of water sources may require farmers to bring water in from out of the area to irrigate crops or to water livestock. Livestock may also come into contact with contaminated water, if

waterbodies pass through pastoral land where they are grazing. The extent of these effects would depend on several factors, including volume, product and length of exposure. In the event of effects on business or landowners, Trans Mountain will make initial mitigation efforts to contain the hydrocarbon release, followed by clean-up and restoration of the site. Landowners and businesses will be compensated for impacts directly resulting from a hydrocarbon release.”

**Vlail** Application Volume 6B Appenix C page 217 “2.3.1 Organic Farms Issues and Mitigation Measures The potential for introduction of weeds by construction equipment and vehicles is one of the greatest concerns with organic farms since these farms do not use herbicides and, consequently, any introduced weeds will likely require a substantial amount of physical effort and cost to control. Organic farms typically require three or more years that are herbicide, pesticide, chemical fertilizer and other contaminant-free to obtain their certification as "organic". In some cases, a field may not be designated as organic although the farmer may have initiated the certification process. Due to the length of time required to obtain an organic certification, lands will be encountered that are in the process of becoming certified organic. Therefore, any circumstances (e.g., accidental application of herbicide) that results in starting the process again from year zero or require the farmer to physically control introduced weeds will result in substantial effort and costs to the landowner.”

**Vlaili** Inside Climate News, June 5, 2013 *TransCanada Digging Up Defective Segments of New Pipeline, Angering Landowners in Texas* <http://insideclimatenews.org/news/20130605/transcanada-digging-defective-segments-new-pipeline-angering-landowners-texas> “Richard Kuprewicz, president of the pipeline consulting firm Accufacts Inc., said it's hard to tell whether the anomalies are problematic without more details. "There is no such thing as an anomaly-free pipeline, not even a new pipeline. The question is, are the anomalies of such nature that they could go to failure in the near future?"

**Vlailv** Biodynamic Standards / Certification (Boni Townsend's farm is certified)  
<http://www.biodynamic.org.uk/certification/introduction/demeter-certification/farming.html>

**Vlailv** Minutes of the Matsqui Drainage Dyking and Irrigation Committee Nov. 2013  
<https://abbotsford.civicweb.net/Documents/DocumentList.aspx?ID=32138>

“.4 Trans Mountain Pipe Line

Mr. Keis wanted to discuss the Trans Mountain Pipeline crossing ditches. The depth of the pipeline in the ditches needs to be considered in regard to maintenance. He suggested that concrete be placed over the pipe for protection. The Director of Wastewater and Drainage advised that Kinder Morgan will be invited to the Joint 001 Meeting in March 2014 to respond to the concerns raised at the last Joint DOI meeting.”

**Vlailv** Abbotsford News May 18, 2012 *Fertile ground: Abbotsford agriculture bucks the national trend*  
<http://www.abbynews.com/news/152058085.html>

“There are 418 farms categorized as fruit and tree nut type farms, 232 poultry and egg production, and 185 greenhouse and nursery type farms.

Elizabeth Abraham of Statistics Canada explained that a farm type is classified if more than 50 per cent of its receipts come from one particular farm product. So while a large farm may have cattle and poultry

as well as blueberries, it is classified as fruit and tree nut if 50 per cent of its sales come from the berries.

A total of 490 farms grow some type of fruit, berries or nuts in Abbotsford, totaling about 10,300 acres. In B.C. there are 4,654 farms growing fruit berries or nuts covering 60,500 acres.

Abbotsford has 374 farms growing blueberries, 28 per cent of the 1,348 farms provincially.

About 58 per cent of all hogs in B.C. are located in Abbotsford.

There are 627 farms that reported having pigs in B.C., with 22 in Abbotsford, totalling 51,530 hogs. The B.C. total is 89,067.

Abbotsford also has 44 per cent of the chickens in the province.”

**Vlavii** Warnock concluded that BC was 47% self-reliant and that to maintain this level would require a 40-60% increase in production to the year 2000. The complete paper was not available<sup>11</sup>.

### **Preamble**

According to a report commissioned by the Abbotsford Chamber of Commerce agriculture is worth \$1.8 billion / year and 11,000 jobs. According to a letter from the Fraser Valley Regional District to Kinder Morgan re the Trans Mountain Expansion outlining concerns agriculture in the region is worth \$2.5 billion per year. According to a Ministry of Agriculture report in 2006 the Fraser Valley produces up to 80% of some foods and in B.C. is only 48% food self-reliant.

There are 85 certified organic farms in the Fraser Valley. While weeds are one concern, rigorous audits of soil quality and water quality are required for the certification process, especially for biodynamic certification. The need to satisfy the certifying bodies will be needed pre and post construction as well as in the event of a spill on or in close proximity to the certified organic farm and or its water source(s). Land owners have advised PIPE UP Network that there have been problems with the applicant's contractor(s) who have not complied with assurances made to the landowner (by the applicant) when performing maintenance work on the ROW on the landowners property.

### **Information Request based on the above noted references**

**Vlbi** Will Kinder Morgan pay for soil and water tests prior to and every year after construction and or after a spill for at least five years? Will this be done by an independent lab?

**Vlbii** What form of air, water, soil monitoring will take place to protect farm workers from off-gassing / spills?

**Vlbiii** How will the applicant ensure that contractors follow the same procedures regarding weeds post construction when they perform regular maintenance on or in in close proximity to a certified organic farm that are prescribed during construction?

**Vlbiv** How will the applicant compensate landowners for any harm done by the applicant's contractors?

**Vlbv** Trans Mountain report the following: According to a Department of Agriculture map there are several different soil type in the Sumas Vedder Mountain area, some with more clay content than your

sample indicated. Trans Mountain logged sample sites in longitude and latitude rather than pinpointing them on a map. Only one soil sample was noted in the Sumas Vedder Mountain area with the remainder samples being taken in Sardis and one (RK1114.6/7 listed as Sumas River) on the north side of the Trans Canada Hwy close to the foot of Sumas Mountain and a fair distance from your existing pipeline. The only sample (RK1104.7-RK1107.5) found on your chart for the Sumas Vedder area was taken at the rail way crossing at Yarrow Central, on the on the south side of road at foot of Vedder Mountain. This soil sample is not representative of the Sumas Vedder Mountain area. The lack of soil samples seems inconsistent considering the existing pipeline runs along the base of the Vedder Mountain continuing on through Abbotsford according to Trans Mountain's maps. We request Trans Mountain confirm the locations of your soil samples and specifically how many in the Sumas Vedder corridor were collected and those findings. We request test sites be represented on a topographical map with town/street references.

## **VII Risks to Endangered Species Habitat**

**VIIai** New York Times May 2, 2014 *Accident Leads to Scrutiny of Oil Sands Production*

<http://www.nytimes.com/2014/05/03/business/energy-environment/accident-leads-to-scrutiny-of-oil-sand-production.html?hpw&rref=business&action=click&module=Search&region=searchResults&mabReward=relbias%3As&url=http%3A%2F%2Fquery.nytimes.com%2Fsearch%2Fsite%2F%3Faction%3Gtype%3Dundefined%23%2Faccident+leads+to+scrutiny+of+oil+sands+production> "No one was hurt in [the accident](#), which spread across at least 17 acres in the Primrose [oil sands](#) field, and the most damage to wildlife came from the **killing of about 70 frogs in a lake contaminated by the leak. It has since been drained.**"

**VIIaii** City of Abbotsford EDP 93 2012 report re Kinder Morgan Trans Mountain Expansion

<https://abbotsford.civicweb.net/Documents/DocumentList.aspx?ID=25557>

**VIIaiii** *Sumas Mountain Environmental Management Study: Species at Risk* Pages 1 to 16 Red Listed 14, Blue Listed 23

2BC Status: the BC government's Conservation Data Centre designates a conservation status for species and ecosystems in BC • **Red: Any indigenous species or subspecies that have, or are candidates for, Extirpated, Endangered, or Threatened status in BC** • **Blue: Any indigenous species or subspecies of Special Concern (formerly Vulnerable) in BC and have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. (my emphasis)**

**VIIaiv** Cheam Lake Bio Blitz Report 2008

[http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CFAQFjAC&url=http%3A%2F%2Fwww.geog.ubc.ca%2Fbiodiversity%2Fdocuments%2FCheam\\_Lake\\_bioblitz\\_rprt\\_aug\\_08.pdf&ei=bZrU9GPHJHjoATlpoG4BQ&usq=AFQjCNHXufjFRfsURQZFTOq5i3Spji8YTw&sig2=Q2hkNzteD8aDtsoNy0Vt5g](http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CFAQFjAC&url=http%3A%2F%2Fwww.geog.ubc.ca%2Fbiodiversity%2Fdocuments%2FCheam_Lake_bioblitz_rprt_aug_08.pdf&ei=bZrU9GPHJHjoATlpoG4BQ&usq=AFQjCNHXufjFRfsURQZFTOq5i3Spji8YTw&sig2=Q2hkNzteD8aDtsoNy0Vt5g) Page 11 8 red and 11 blue listed endangered species such as red legged frog and Oregon spotted frog.

**Vlav** Trans Mountain Expansion web site re Route Map Changes Hope to Abbotsford  
<http://talk.transmountain.com/transmountain#Online> \*\* **Cheam Lake Wetland**

**Vlavi Application Volume 7 spill scenario maps pages 32 to 45**

**Vlavii** Kinder Morgan Trans Mountain Expansion *Community Update Study Corridor Optimization Workshop Etiquette Handout* "Meeting Records Participants will be provided with the session notes following the workshop." **Date of Meeting Mar 27, 2014 Chilliwack B.C. Re City of Abbotsford position, B.C. Ministry of Highways position and changes to ROW Hope to Abbotsford from memory due to notes not provided per Lexa Hobenshield as of deadline for the submission of this Information Request 1 email of April 9, 2014 from Lexa Hobenshield to me** "Thank you again for participating in our workshop on March 27th. I hope to be able to circulate the notes from the last two weeks at some point next week. I believe the meeting notes from June 2013 were posted online for those interested to review and print as they wished after those sessions, but I can also send these to you" From my recollection Route Maps distributed indicate corridor changes in Hope, Chilliwack and Abbotsford. The City of Abbotsford Manager asking if there were other changes to corridor ROW through Ledgeview Golf Course or Sandy Hill residential area. Three emphatic "NO" responses from Kinder Morgan Trans Mountain Expansion routing staff. Ministry of Highways and City of Chilliwack staff expressing concern re the expansion on their roadways as Kinder Morgan Trans Mountain has first decision making protocol. Soil conservation representative expressing the problems of farmers who have the ROW through their land as .9 meter is too shallow.

### **Preamble**

The Fraser Valley of B.C. is one of the richest regions in bio-diversity of species. However, the regional also has a great number of red and blue listed species at risk. The residents of the Fraser Valley take protection of endangered species very serious as is evident in our investment in parks for instance Cheam Lake Wetland Park, Sumas Mountain Park and Surrey Bend Park. Children have halted development due to the presence of the red legged frog.

### **Information Request based on the above noted references**

**VIIbi** Why did you not used a peer reviewed Environmental Assessment?

**VIIbii** Why did you submit your application well before the Environmental Assessment was completed as was admitted to the Fraser Regional District Committee of the Whole in March 2014?

**VIIbiii** Why did you initially consider running the expansion through the Cheam Lake Wetland Park?

**VIIbiv** Have your formally submitted the changes to the Corridor Maps between Hope and Abbotsford B.C. per your web site and March 27, 2014 workshop handouts to the National Energy Board? If not, why not?

## **VIII Risks to Salmon Habitat**

**VIIIai** Cohen Commission *The uncertain future of Fraser River sockeye Volume 1 • The Sockeye Fishery* Page 334 "If a spill is marine in origin, the Environment Canada co-chair of the REET determines what agencies should be brought into the REET to assess any impacts. However, the REET is only an advisory organization, and the Coast Guard choose to ignore the REET's advice.

The Coast Guard can also prefer the approach to cleanup and monitoring proposed by the polluter or clean-up company over the REET's recommendations. With respect to cost and reasonableness, the Coast Guard tries to recover its costs for marine spill response from the polluter, its insurance company, or the Ship Source Oil Pollution Fund. When a claim is submitted to one of these three sources of funds, the Coast Guard must demonstrate reasonableness or it will not recover its monitoring or response costs.

On the evidence, I am satisfied that the Coast Guard has the organizational structure; staffing; response equipment; vessel, logistical, and air support; and liaison experience to make it an appropriate first responder for marine spills. I also conclude that the REET is the appropriate body to provide advice on monitoring plans and habitat issues.

**However, I have several concerns respecting post-emergency mitigation and long-term monitoring of the impacts of marine spills.** I accept the evidence of Dr. Peter Ross, research scientist, Marine Environmental Quality Section, Institute of Ocean Sciences, Science Branch, that it is important to have scientists who are experts in the field of contaminants and anadromous fish involved in the marine spill response process to provide advice, recommend sampling and monitoring, and help guide mitigation efforts or cleanup. The current decision maker (the on-scene commander or federal monitoring officer) does not have expertise in long-term habitat monitoring. The Coast Guard is not required to implement the advice of the REET, and there is no mandatory role for DFO Science or OHEB."

**VIIIaii** Inside Climate News, June 5, 2013 *TransCanada Digging Up Defective Segments of New Pipeline, Angering Landowners in Texas* <http://insideclimatenews.org/news/20130605/transcanada-digging-defective-segments-new-pipeline-angering-landowners-texas> "Richard Kuprewicz, president of the pipeline consulting firm Accufacts Inc., said it's hard to tell whether the anomalies are problematic without more details. "There is no such thing as an anomaly-free pipeline, not even a new pipeline. The question is, are the anomalies of such nature that they could go to failure in the near future?"

"Whitley said he saw two workers drop a hose into a hole they'd dug, which had filled with groundwater. They placed the other end of the hose into a creek on Whitley's property, about 50 feet outside the pipeline's right-of-way. Whitley then heard them turn on a pump and realized they were pumping the groundwater into his creek."

**VIIIaiii** *CLIMATE CHANGE IMPACTS IN THE UNITED STATES 21 NORTHWEST* "Region-wide summer temperature increases and, in certain basins, increased river flooding and winter flows and decreased summer flows, will threaten many freshwater species, particularly salmon, steelhead, and trout.<sup>27</sup> Rising temperatures will increase disease and/or mortality in several iconic salmon species, especially for spring/summer Chinook and sockeye in the interior Columbia and Snake River basins.<sup>36</sup> Some Northwest streams<sup>30</sup> and lakes have already warmed over the past three decades, contributing to changes such as earlier Columbia River sockeye salmon migration<sup>37</sup> and earlier blooms of algae in Lake Washington."

**VIIIaiv** *Cohen Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River • Volume 1 Chapter 10 • Wild Salmon Policy* Page 551 "In addition, Mr. Sprout noted that the province and regional districts would have to decide whether they would lead integrated strategic planning processes to address threats to Pacific salmon, such as climate change and various habitat impacts, and that the federal government "can only be a participant in those processes; it's not going to be able to lead."<sup>409</sup>

Mr. Ryall and Mr. Saunders agreed that DFO holds some, but not all of the policy or management “levers” over water or other aspects of fish habitat.<sup>410</sup> Mr. Sprout stated that others with “jurisdictional responsibilities” should lead watershed-based planning processes. He went on to say that any recommendations that I make on integrated planning for salmon conservation “will have to be looked at by parties who are not federal,” because this activity would involve matters outside DFO jurisdiction.<sup>411</sup> Again, this proposition does not square with the clear levers over fish and fish habitat found in sections 35 and 36 of the Fisheries Act. Although the overlapping jurisdiction of the province may make the department’s habitat work more challenging, DFO does hold levers and is directed to take a lead role in integrated planning through Strategy 4 of the Wild Salmon Policy.”

**VIIIav** City of Abbotsford *Clayburn Creek ISMP Final Report May 2012* Page 48 Six (and possibly seven) salmonid species, nine native non-salmonid species, and two introduced fish species are known from the ISMP study area:

- Coho salmon and resident cutthroat trout are the two most abundant salmonid species in the study area. Smaller runs of Chum, Steelhead, searun Cutthroat Trout and possibly Pink salmon (odd years only) are also known from the watershed. Chinook and Sockeye do not reproduce in the study area but may enter as juveniles from the Fraser River.

**VIIIavi** of Abbotsford *Clayburn Creek ISMP Final Report May 2012* Page 49 “Instream Fish Habitat

Fish habitat was assessed across five major areas:

- Lowland portions of Clayburn Creek and Stoney Creek: The Clayburn Creek subwatershed is known historically for its high salmon habitat in lowland agricultural reaches (Study area boundary upstream to Old Clayburn Road (Clayburn Creek) and Bateman Road (Stoney Creek)): The lower agricultural reaches of Clayburn and Stoney Creeks offer some limited spawning habitat for Chum, Coho, and (possibly) Pink salmon, as well as Steelhead/Rainbow trout and Cutthroat trout. The large amount of poorly sorted sediments deposited, as the creeks emerge from the west slope of Sumas Mountain, limits spawning and historically led to frequent dredging. Lowland reaches would have historically been important rearing habitat for Coho; however, the dredging as well as channelization and straightening has resulted in a lack of pool habitats and instream cover, and reduced rearing capacity. Furthermore, streamside vegetation in these reaches is either lacking entirely or limited to a very narrow band of trees and shrubs.
- Middle and upper reaches of Clayburn Creek (upstream of Old Clayburn Rd): The middle reaches of Clayburn Creek are some of the most productive reaches of the watershed. These reaches are characterized by a moderate channel gradient, cobble/boulder substrates, large wood debris and boulders, and (with the exception of the presence of Straiton Rd) a wide riparian buffer. Coho, Chum, Steelhead/Rainbow trout, and Cutthroat trout have all been reported in the areas upstream of Clayburn Village (IRC, 1994). A ravine section of the creek, above the confluence with Poignant Creek and below the Auguston Development, is excellent spawning and rearing habitat for Coho. Fish passage further upstream is restricted by a steeper section with several small falls (Schubert, 1982). Increased sedimentation within the ravine has degraded fish habitat in this area (A. Jonsson, pers. comm.; D. Sutherland, pers. comm.). Several eroding ravine slopes exist below the Ledgeview Golf Course. The **headwaters** of Clayburn Creek, upstream of McKee Rd, go dry in late summer.”

**VIIIavii** Application Volume 5C 1 of 17 Page 21 Table 3.2.1 <https://docs.neb-one.gc.ca/II-eng/IIisapi.dll?func=II&objId=2393181&objAction=browse&viewType=1> –Trans Mountain state an

intent to do horizontal directional drilling on the Vedder and Sumas River crossing “Under such circumstances, either open cut or HDD may require special measures to mitigate or prevent affects caused by groundwater inflows.”

**VIIIviii** River run rates can be obtained through Ministry of Forests, Lands and Natural Resource Operations <http://bcrcfc.env.gov.bc.ca/data/asp/archive.htm>

**VIIIaix** Department of Fisheries and Oceans spawning ponds on Sumas Prairie (EG. on Lowland Herb Farm) <http://www.lowlandherbfarm.com/>

### **Preamble**

In addition to farming salmon is an essential economy and food in B.C. Local residents are cautioned about what they put into storm sewers lest fish be negatively impacted. School children stock creeks with salmon fry every year in West Creek Langley. Due to spawning salmon the Fraser Valley is rich in bald eagles and other species that depend upon salmon for their existence. Fraser River Sockeye salmon have had significant challenges that the governments Canada embarked upon the Cohen Commission. In B.C. we know that the health of the ecology of each creek is essential to the health of salmon unique to that creek. There are a number of those creeks in the Fraser Valley section of the proposed expansion that **must** be protected.

### **Information Request based on the above noted references**

**VIIIbi** Do you use any chemical solvents/lubricants during drilling “in the hole”?

**VIIIbii** Trans Mountain also mention the possibility of flooding at the drill site that could hinder HDD drilling, and state “Under such circumstances, either open cut or HDD may require special measures to mitigate or prevent affects caused by groundwater inflows.” Please explain in detail what Trans Mountain mean by “special measures”

**VIIIbiii** How many days will the Vedder and Sumas River crossing HDD drilling take to complete? How much river bank will be disrupted or displaced by HDD drilling on both banks?

**VIIIbiv** The Vedder River is one of many of our productive salmon spawning rivers in the Fraser Valley. BC Rivers, including the Chilliwack/Vedder River have seasonal and daily run rates. Provide Trans Mountain’s analysis’s that include river run rate variables and impact.

**VIIIbv** Does Trans Mountain intend to do any HDD drilling during the various salmon runs up the river? What drilling mitigation measures do you have in place to minimize impact to river estuaries, fish and birds, including eagles that may be nesting along the river?

**VIIIbvi** How loud is the machine you use for HDD drilling? What measurable level of reverberation does it create and how long are drilling sessions?

**VIIIbvii** Will you be using the same procedures for crossing other waterways which are all salmon habitat: Sumas River, Clayburn, McLennan and Nathan Creeks in Abbotsford and West Creek in Langley?

**IX Constitutional Right to Security of the Person**

**IXai** CONSTITUTION ACT, 1982 PART I CANADIAN CHARTER OF RIGHTS AND FREEDOMS <http://laws-lois.justice.gc.ca/eng/const/page-15.html>

LEGAL RIGHTS Life, liberty and security of person

**7. Everyone has the right to life, liberty and security of the person and the right not to be deprived thereof except in accordance with the principles of fundamental justice.** (my emphasis)

**IXaii** *National Energy Board Act Right of Entry*

- **104. (1) Subject to subsection (2), the Board may, on application in writing by a company, if the Board considers it proper to do so, issue an order to the company granting it an immediate right to enter any lands on such terms and conditions, if any, as the Board may specify in the order**
- Where immediate right of entry prohibited
- (2) An order under subsection (1) shall not be issued in respect of any lands unless the company making the application for the order satisfies the Board that the owner of the lands has, not less than thirty days and not more than sixty days prior to the date of the application, been served with a notice setting out
  - (a) the date the company intends to make its application to the Board under subsection (1);
  - (b) the date the company wishes to enter the lands;
  - (c) the address of the Board to which any objection in writing that the owner might wish to make concerning the issuance of the order may be sent; and
  - (d) a description of the right of the owner to an advance of compensation under section 105 if the order is issued and the amount of the advance that the company is prepared to make.
  - **105.** Where a company has been granted an immediate right to enter any lands under subsection 104(1), the owner of the lands is entitled to receive from the company an amount as an advance of the compensation referred to in subsection 88(1) and where the owner has not received an advance or is not agreeable to the amount of the advance offered by the company, the owner may serve a notice of arbitration on the company and on the Minister requesting that the matter be determined by arbitration. 1980-81-82-83, c. 80, s. 5.
  - Vesting and registration
  - **106. An order under subsection 104(1) granting to a company an immediate right to enter any lands**
  - **(a) shall be deemed to vest in the company any title, interest or right in the lands in respect of which the order is granted that is specified in the order; and**
  - (b) shall be deposited in, and shall be registered, recorded or filed, as the case requires, by the registrar of deeds of, the land registry or land titles office in which land transactions affecting those lands may be deposited, registered, recorded or filed. **(my emphasis)**

**Preamble**

There are well over 1 million people who live between the beginning and end of the current and proposed expansion. There have been at least 80 spills from the current pipeline. The technology used by the applicant – so far- has not prevented spills., While Trans Mountain staff have been conducting community consultations and ensuring “directly affected” public that technology will protect their health and safety; Trans Mountain staff at the Edmonton control center ignored alarms when the January 2012 spill took place. Both the applicant and the National Energy Board refused to tell “directly affected” residents what they were exposed to. The application itself notes that diluted bitumen, the only product that the pipeline will transport, is toxic and may cause death. The applicant cannot guarantee that there will never be a spill or that they can respond within one hour of exposure to a spill. This may have a significant negative psychological impact upon residents of the Fraser Valley of B.C. who are “directly affected” whom PIPE UP Network is intervening on behalf of.

**Information Request based on the above noted references and References in Section II of this document**

**Ixb1** Does the applicant believe that the National Energy Board Act Right of Entry S104 to S106 override the “directly affected” residents’ rights under the Constitution Act Part 1 Charter of Rights and Freedoms Section 7 right to life and security of the person?