



Public Health Association of British Columbia
#210 – 1027 Pandora Avenue
Victoria, BC V8V 3P6
Phone: (250) 595-8422 / Fax: (250) 595-8622
www.phabc.org

January 30, 2017

The Honourable Mary Polak, Minister of Environment
The Honourable Terry Lake, Minister of Health
The Honourable Christy Clark, Premier of British Columbia

Re: The Approval of the Expansion of the Kinder Morgan Trans Mountain Pipeline.

The Public Health Association of British Columbia (PHABC) is a voluntary, non-profit, non-government organization, whose mission is to promote health, wellbeing and equity for all British Columbians through leadership in public health. The association is made up of public health professionals including students, researchers, policy makers, practitioners and academics in the field. As a member-driven organization, we fulfill our mission through advocacy, collaboration and engagement activities, education, and research throughout the spectrum of public health practice and systems including prevention, promotion, protection and policy.

We are writing regarding the Kinder Morgan Trans Mountain Expansion (TMX) approval. We feel compelled to express once more that the expansion of this pipeline is not in the interests of public health in BC and for that reason should not be allowed to proceed.

PHABC members have written to the Prime Minister's office and the National Energy Board as a group, as well as individually as commenters and intervenors, to express our multitude of concerns from direct health impacts to the indirect impacts, such as climate change. A report by Dr. Tim Takaro submitted to the National Energy Board concluded that a proper assessment of the health impacts of the TMX under less than ideal conditions has not been done (1), nor was climate change allowed to be spoken of during the National Energy Board hearing process. It is imperative that a comprehensive health review, including climate change, is conducted by independent reviewers not affiliated with industry.

The health costs of the TMX project due to ambient exposure of populations, the physical and mental health impacts of an oil spill, the social determinant of health costs, as well as those health costs due directly or indirectly to climate change have not been adequately taken into account. Further, the real fiscal health costs of climate change inaction far out-weigh any proposed economic benefit of this project. We strongly encourage the BC government to consider the evidence and reconsider approval of the TMX project. We further **encourage the government to include a comprehensive and multi-pronged health impact assessment, including climate change and associated health costs, into the provincial environmental assessment procedure.**

Finally, we recommend that the BC government undertake a comprehensive health impact assessment of BC's energy systems, its energy exports, and alternative energy scenarios. The absence of such information means that BC is making energy policy decisions with just one eye open to the benefits, but without a true appreciation of the costs.

Sincerely,

Paola Ardiles
PHABC President

Evidence Review:

Specific health-related reasons for our objections to this project include, but are not limited to:

- 1) The TMX expansion would put the health and safety of millions of Canadians at risk. In Vancouver alone, 133,100 to 1,077,700 people could face acute health risks due to exceeded exposure to benzene if a spill were to take place in a well populated area. The transported diluted bitumen from the TMX project contains volatile organic compounds (VOCs), polycyclic organic hydrocarbons, benzene, heavy metals and 1,3 butadiene which are known carcinogens, and known to cause cardiovascular and respiratory effects, neurological dysfunction, psychological and behavioural abnormalities, chromosomal issues, reproductive and developmental effects and death from arteriosclerotic heart disease (1). The approval of TMX would mean the approval of Canadians' exposure to harmful and lethal compounds.

This is especially worrying for vulnerable populations, such as the children who live in the vicinity of the Kinder Morgan pipeline. A report from South-Eastern Texas looking at the relationship between ambient concentrations of benzene and butadiene and the incidence of lymphohaematopoietic cancer in children saw elevated rates of leukemia around the areas where the highest levels of these chemicals were found in the air (2).

- 2) Many long-term health impacts of oil spills are unknown, as there is a lack of long term studies. Short term effects on clean-up workers showed nausea and vomiting, burning eyes and respiratory symptoms last for months (3-9). One study of the *Prestige* oil spill in Spain noted 7 years of endocrine disruption in clean-up workers (10,11), while other studies showed workers had respiratory injury symptoms up to 5 years later (12-15). Residents living close to spills noted headaches, eye, and throat irritation; however, long term consequences to the general public are largely unknown (16,17).
- 3) Mental health and anxiety impacts are seen in communities affected by spills. Many studies examining the Exxon Valdez spill have shown that those individuals greatly impacted by the spill as far as livelihoods or contact with the oil spill had increased risk of generalized anxiety disorder, post-traumatic stress disorder, and depression, lasting from 1.5 to 8 years (18,19). Indigenous people and women were more likely to experience depression. Along with decreases in community cohesion, which is also an indicator of community health, community members who were impacted financially experienced anger, fatigue, depression, tension/anxiety, and confusion compared to income-stable residents (20,21). Troublingly, children, especially girls, living on the coastline near oil spills had increased depression, or other signs of mental health issues including sadness, fear, and sleeplessness, especially if their families had been economically impacted by the spill (22).
- 4) The TMX project would heavily increase the risk of marine spills which have limited recoverability compared to conventional oil, and the transportation of bitumen would increase risks of non-recoverability.

There is a brief initial period when diluted bitumen can be contained and recovered. However, if weathering takes place, a significant portion of the spilled oil can become submerged. Impaired water quality and hazardous air pollution risks are increased by the density and adhesion of diluted bitumen, and there are much higher levels of concerns associated with spills of diluted bitumen compared to spills of other commonly transported oils, as weathered diluted bitumen cannot be recovered, and does not degrade when left in the environment. (23)

- 5) Long term stable jobs and industries, with regular income, are a major component of human health (24). One oil spill would have a devastating effect on the tourism and fisheries industries alone, from loss of income to stress. This would be unfortunate for the people relying on those industries, and from an economic point of view, the tourism industry of Vancouver brings in \$6.1 billion annually alone (<https://www.tourismvancouver.com/media/.../vancouvers-tourism-industry-fast-facts>), where the TMX is expected to bring in \$5.7 billion to BC over the life of the project (<https://www.transmountain.com/economic-benefit>).
- 6) Approval of the TMX pipeline would result in an increase in the production, export and use of 'dirty' oil from the Alberta tar sands, which would contribute to a global climate scenario above 1.5°C of warming that the Government of Canada committed to in the Paris Agreement. A recent report suggests that in Canada, 74% of oil reserves (and 99% of 'unconventional oil: i.e. Alberta's oil sands, 71% of unconventional gas reserves (fracking) and 75% of coal is non-burnable if we are to keep global warming below 2°C (25). Moreover, the combustion of this oil is likely to lead to increased air pollution where it is used (see next point).
- 7) In her commentary on the most recent *Lancet* Commission on Climate Change and Health Dr. Margaret Chan, the Director-General of the World Health Organization, noted that:

"The health impacts of air pollution are not reflected in the price of the fuels that cause them, so that the cost is instead borne in lost lives, and health system expenditure. A recent report by researchers at the International Monetary Fund identifies the omission of health damages from polluting fuels as the largest of the subsidies provided to global energy production and use, which will total US\$5.3 trillion in 2015. This is larger than total health spending by all world's governments." (26)

Though the World Health Organization calls climate change the greatest threat to human health of our time, currently, BC's climate change adaptation plan has no section on health measures. The health impacts of climate change can be direct, such as injuries and death from extreme heat events, and indirect, like creating favourable conditions for infectious disease outbreaks or negatively impacting socioeconomic conditions (27).

Along with changing precipitation patterns, the annual average surface temperature over Canada's landmass has increased by 1.7 degrees C since 1948, a rate almost twice the global average, and by even more in Northern Canada, which is experiencing climate change faster than anywhere else in the world. People living in Northern BC are increasingly impacted by climate change, from food security due to declines in the caribou population, to unstable ice roads, to the stress impacts of seeing the impact of climate change on the landscape (28). Though it could help with Canadians' health by reducing cold-related mortality, the overall health burden is expected to increase (27).

The health impacts of climate change are not taken into account in this or other fossil fuel expansion projects, nor are the increasing costs to our health care system, which the majority of Canadian hold dear. The 2008 report from the Federal Round-table on the Environment and the Economy estimated that the increasing health care costs of climate change simply from premature mortality due to heat and air quality impacts between 2010 and 2100 range between \$164-285 billion for Vancouver, Toronto, Calgary, and Montreal alone (29).

Our allies at the Canadian Association of Physicians for the Environment (CAPE) have recently written to the Minister of Environment and Climate Change recommending the establishment of an integrated Health Impact Assessment into the federal Environmental Process. We support this approach, and we feel it is important that BC also incorporate such as practice into our environmental assessment. As stated in CAPE's letter to the minister:

“The report by The World Commission on Environment and Development (1987) encouraged human activities that meet the needs of the present generation without compromising the ability of future generations to meet their own needs. To achieve this goal and reflect the well-being of people and communities within development, EA will need processes that frame development as a human objective. Roughly 60% of our health is attributable to the social, economic and physical environments within which we live. Without placing health centrally in EA processes, we risk ignoring 60% of development proposal objectives..

Health promotion and disease prevention is less costly. In many cases, the economic activity anticipated from development proposals are presumed to be beneficial and additive, ignoring the adverse health impacts of much economic activity (crime, health care, policing, lawyers, disease and pollution for example). In other cases, cost-benefit analyses inadequately evaluate health and community well-being. Overburdened and costly health care systems and structures result from myopic, simplified, or misdirected development decisions, including policies, plans and programs that inadequately account for the health impacts of those proposals. The preventive fiscal benefits of including health and community well-being in decision making processes far outweigh the costs of doing so.”(30)

References

- 1) <https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/open/2785040>
- 2) Whitworth KW¹, Symanski E, Coker AL. Childhood lymphohematopoietic cancer incidence and hazardous air pollutants in southeast Texas, 1995-2004. *Environ Health Perspect.* 2008 Nov;116(11):1576-80. doi: 10.1289/ehp.11593. Epub 2008 Aug 25.
- 3) Morita A, Kusaka Y, Deguchi Y, Moriuchi A, Nakanaga Y, Iki M, Miyazaki S, Kawahara K. Acute health problems among the people engaged in the cleanup of the Nakhodka oil spill. *Environ Res.* 1999;81(3):185-194.
- 4) Gwack J, Lee JH, Kang YA, Chang K-J, Lee MS, Hong JY. Acute health effects among military personnel participating in the cleanup of the Hebei Spirit oil spill, 2007, in Taean County, Korea. *Osong Public Health Res Perspect.* 2012;3(4):206-12.
- 5) Carrasco JM, Lope V, Pérez-Gómez B, Aragonés N, Suárez B, López-Abente G, Rodríguez-Artalejo F, Pollán M. Association between health information, use of protective devices and occurrence of acute health problems in the Prestige oil spill clean-up in Asturias and Cantabria (Spain): a cross-sectional study. *BMC Public Health.* 2006;6:1.
- 6) King B, Gibbons J. Health Hazard Evaluation of Deepwater Horizon Response Workers (HETA 2010-0115 & 2010-0129-3138). Springfield, Virginia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; National Institute for Occupational Safety and Health; 2011 Aug. Available from: <http://www.cdc.gov/niosh/hhe/reports/pdfs/2010-0115-0129-3138.pdf>.
- 7) Suárez B, Lope V, Pérez-Gómez B, Aragonés N, Rodríguez-Artalejo F, Marqués F, Guzmán A, Vilorio, Carrasco JM, Martín-Moreno JM, López-Abente G, Pollán M. Acute health problems among subjects involved in the cleanup operation following the Prestige oil spill in Asturias and Cantabria (Spain). *Environ Res.* 2005;99(3):413-24.
- 8) Meo S, Al-Drees A, Rasheed S, Meo I, Al-Saadi M, Ghani H, Alkandari J. Health complaints among subjects involved in oil cleanup operations during oil spillage from a Greek tanker “Tasman Spirit.” *Int J Occup Med Environ Health.* 2009;22(2):143-148.
- 9) Sim M, Jo I, Song H. Acute health problems related to the operation mounted to clean the Hebei Spirit oil spill in Taean, Korea. *Mar Poll Bull.* 2010;60(1):51-57.

- 10) Zock J-P, Rodríguez-Trigo G, Pozo-Rodríguez F, Barberà JA, Bouso L, Torralba Y, Antó JM, Gómez FP, Fuster C, Vereá H. Prolonged respiratory symptoms in clean-up workers of the Prestige oil spill. *Am J Respir Crit Care Med*. 2007;176(6):610–616.
- 11) Zock J-P, Rodríguez-Trigo G, Rodríguez-Rodríguez E, Espinosa A, Pozo-Rodríguez F, Gómez F, Fuster C, Castaño-Vinyals G, Antó JM, Barberà JA. Persistent respiratory symptoms in clean-up workers 5 years after the Prestige oil spill. *Occup Environ Med* 2012;69(7):508–13.
- 12) Zock J-P, Rodríguez-Trigo G, Rodríguez-Rodríguez E, Souto-Alonso A, Espinosa A, Pozo-Rodríguez F, Gómez FP, Fuster C, Castaño-Vinyals G, Antó JM, Barberà JA. Evaluation of the persistence of functional and biological respiratory health effects in clean-up workers 6 years after the Prestige oil spill. *Environ Int*. 2014;62:72–7.
- 13) Rodríguez-Trigo G. Health changes in fishermen 2 years after clean-up of the Prestige oil spill. *Ann Internal Med*. 2010;153(8):489–498.
- 14) Laffon B, Aguilera F, Ríos-Vázquez J, García-Lestón J, Fuchs D, Valdíglesias V, Pásaro E. Endocrine and immunological parameters in individuals involved in Prestige spill cleanup tasks seven years after the exposure. *Environ Int*. 2013;59:103–11.
- 15) Pérez-Cadahía B, Méndez J, Pásaro E, Lafuente A, Cabaleiro T, Laffon B. Biomonitoring of human exposure to prestige oil: effects on DNA and endocrine parameters. *Environ Health Insights*. 2008;2:83–92.
- 16) Campbell D, Cox D, Crum J, Foster K, Riley A. Later effects of grounding of tanker Braer on health in Shetland. *Brit Med J*. 1994;309(6957):773–4.
- 17) Lyons R, Temple J, Evans D. Acute health effects of the Sea Empress oil spill. *J Epidemiol Commun H*. 1999;53:306–310.
- 18) Picou J, Gill D. Disruption and stress in an Alaskan fishing community: Initial and continuing impacts of the Exxon Valdez oil spill. *Organ Environ*. 1992;6(3):235–257.
- 19) Arata CM, Picou JS, Johnson GD, McNally TS. Coping with technological disaster: an application of the conservation of resources model to the Exxon Valdez oil spill. *J Traumatic Stress*. 2000;13(1):23–39.
- 20) Grattan LM, Roberts S, Mahan WT, McLaughlin PK, Otwell WS, Morris JG. The early psychological impacts of the Deepwater Horizon oil spill on Florida and Alabama communities. *Environ Health Perspect*. 2011;119(6):838–43
- 21) Buttke D, Vagi S, Bayleyegn T, Sircar K, Strine T, Morrison M, Allen M, Wolkin A. Mental health needs assessment after the Gulf Coast oil spill-Alabama and Mississippi, 2010. *Prehosp Disaster Med*. 2012;27(5):401–408
- 22) Ha M, Jeong W-C, Lim M, Kwon H, Choi Y, Yoo S-J, Noh SR, Cheong H-K. Children's mental health in the area affected by the Hebei Spirit oil spill accident. *Environ Health Toxicol*. 2013 Aug 30;28:e2013010.
- 23) https://www.nap.edu/read/21834/chapter/1?mkt_tok=3RkMMJWWfF9wsRons6XAZKXonjHpf sX56uQpXqGzLMi%2F0ER3fOvrPUfGjI4DSspiI%2BSLDwEYGJlv6SgFTbfBMbNo1bgPWRk%3D
- 24) <http://accessalliance.ca/wp-content/uploads/2015/03/ISRH-Research-Bulletin-2-Health-Impacts-of-Employment-Insecurity.pdf>
- 25) McGlade, Christophe and Ekins, Paul (2015) The geographical distribution of fossil fuels unused when limiting global warming to 2°C *Nature*. 2015: 517: 187 – 190

26) Chan, Margaret. Achieving a cleaner, more sustainable, and healthier future The Lancet June 23, 2015.[http://dx.doi.org/10.1016/S0140-6736\(15\)61080-7](http://dx.doi.org/10.1016/S0140-6736(15)61080-7)

27) Austin, S.E., Ford, J.D., Berrang-Ford, L., Araos, M., Parker, S., and Manon D. Fleury. Public Health Adaptation to Climate Change in Canadian Jurisdictions.*Int. J. Environ. Res. Public Health*2015, 12(1), 623-65.

28) Harper SL, Edge VL, Ford J, Willox AC, Wood M, Team IR, et al. Climate sensitive health priorities in Nunatsiavut, Canada. BMC public

health.2015;15:605.<http://www.ncbi.nlm.nih.gov/pubmed/26135309>

29) https://www.fcm.ca/Documents/reports/PCP/paying_the_price_EN.pdf

30)http://www.cpha.ca/uploads/e-mail/HIA-EA_final.pdf