



FRACKING DANGERS



THE COASTAL GASLINK PIPELINE AND FRACKING

The Coastal Gaslink (CGL) pipeline project is a 670 kilometer pipeline currently under construction through unceded “British Columbia”. It is owned by TC Energy, who was known as TransCanada Corp prior to May 2019. The fractured gas, also called liquid natural gas (LNG), that would be transported by the CGL pipeline is fracked in the Montney Shale Formation.

A number of smaller pipelines take this gas from the wells dispersed throughout the region to the CGL line. The CGL pipeline is proposed to run from the Montney region in North Eastern BC and Western Alberta, Dunne-za territory, through unceded Indigenous lands including those of the Wet’suwet’en, to the LNG Canada export terminal to be built at the head of the Douglas Channel in Kitimat, unceded Haisla territory.

LNG Canada proposes to export 12 million tonnes of LNG per year to start, with a plan to double that to 24 million tonnes, with a project lifetime of 40 years. The LNG Tankers will then travel the many turns south on the Douglas Channel before reaching the open water of the Hecate Strait – a total distance of approximately 160 nautical miles that can take up to 20 hours to navigate. Once the LNG arrives at its destination, it is regasified, sold and shipped in its original state.

LNG AND FRACKING

“Liquid Natural Gas” (LNG) is a fossil fuel produced by hydraulic fracturing, known as fracking. “Liquid” in the term LNG simply refers to the fact that the gas has been cooled to a liquid. “Natural” refers to the fact that it is found within the earth like uranium or bitumen.

The conventional method of hydraulic fracturing is not new, however the techniques now being used are:

“When the mining technique began in the 1940s, gas companies drilled vertical wells and pumped pressurized water into rocks to release the gas. Natural gas development really took off in the 1990s when horizontal drilling was developed and combined with fracking; this enabled drills to descend down to 10,000 feet, then curve to drill horizontally thousands more feet so drillers could access gas trapped within shale layers.” (1)

Horizontal fracturing is prevalent, if not used exclusively, in North Eastern BC shale gas extraction.

Once the gas is fracked at the well it is transported by a pipeline in its gas form to an export facility. Once at the facility natural gas is liquefied by lowering the temperature of the hydrocarbon to approximately -260 degrees Fahrenheit (-160 degrees Celsius). This temperature drop liquefies the methane present in the natural gas, making transportation in the form of LNG possible. LNG is mainly constituted of methane and generally contains ethane, as well. Liquefied Petroleum Gas (LPG) may also be present in the LNG. The liquid natural gas is stored in insulated tanks to keep it cold until it is ready to be moved on to massive tankers.

On November 2nd 2019 the United Kingdom imposed a moratorium on fracking joining Scotland, Wales, France, the Netherlands, Denmark and Germany in effectively banning Fracking. (2) As you will read below they have very good reason to do so.

WATER

In order to produce fracked gas, an enormous amount of clean water is rendered toxic.

The amount of water used for each of the wells vary by type of shale gas formation. Shell's Groundbirch operation, for instance, in the Montney region required between 5 million to 10 million liters of water per well, however some industry estimates for shale gas wells in the region cite a need of up to 90 million litres of water per well. (3) This can easily require more than 2,000 truck trips to deliver water, which becomes contaminated after the fracking process. (4)

Some of the fracking slurry injected into a fracked shale formation does come back to the surface. This is called "flowback fluid" and is highly saline, contains toxic chemicals and is oftentimes radioactive. As this toxic fluid is expensive to treat it is usually disposed deep inside injection wells or left in tailings ponds.

As of 2018 there were 200 such wells in northeastern B.C. (5) In 2014 it was also confirmed that on two occasions companies dumped Fracking Waste into Dawson City's water treatment system. (6)

Besides the significant waste of potable water, fracking has the potential to destroy groundwater around fracking sites. Wells use steel pipes surrounded by a cement casing to enter the ground. The high pressures of water being pumped through pipes can cause fissures and the cement used around the well casing has a tendency to shrink over time. With any compromise in the well integrity contaminated water can be released into the earth and can compromise water supplies.

Elizabeth Philipps, in an article for the Georgia Straight explains:

“One of the most significant costs is accidents and toxic wastewater leakage that result from poorly operated or malfunctioning machinery. When these fluids leak into overlying shallow aquifers, they have a profound effect on water quality and human health. Studies have revealed increased incidences of lung and chronic obstructive pulmonary disease in people living in northeastern B.C., as well as high levels of benzene in pregnant women living near the Montney Basin, the 130,000-square-kilometer area that will supply the LNG Canada export facility.” (7)

That is the same facility fed by TC Energy’s Coastal Gaslink Pipeline.

According to John Cherry, contaminant hydrologist and chair of an expert federal panel on the impact of fracking, “The study found that very small amounts of injected methane ended up having a large impact on the aquifer — the magnitude was huge, and the methane hung around for a long time.” (8) To compound this, there is no long term monitoring of groundwater around fracking wells.

These trillions of liters of water are being diverted to operations that warm the planet while British Columbia is already experiencing, and is predicted to experience more droughts. If Coastal Gaslink pipeline expands transportation to the coast expanded fracking operations will be among the consequences.

CLIMATE CHANGE

Fracked gas is also a major contributor of greenhouse gases. While it is true that natural gas emits less carbon when it is burned than coal, the combination of “fugitive emissions” and the massive amount of energy needed to compress and cool the natural gas into its liquid form causes far greater impacts on our climate than the burning of coal.

Methane is a greenhouse gas that scientists believe is responsible for one-quarter of current global warming. While it only stays in the atmosphere for about 12 years before it breaks down and gets reabsorbed into natural systems it has a far greater impact on the climate than carbon dioxide. Over a 20-year period, methane is 84 times more potent than carbon dioxide as a climate pollutant. (9)

In December of 2013 BC’s Oil and Gas Commission published a report on its website after a copy of that document was leaked to the press. This report had been withheld from the public for four years. The report showed that 50 fracked gas wells were leaking methane and that up to 900 gas wells in BC could be leaking methane and contaminating groundwater sources. (10)

A 2017 study conducted by the David Suzuki Foundation in partnership with St. Francis Xavier University found that the “fugitive” leaks from natural gas plants were at least 2.5 times higher than reported by the BC government: “B.C.’s Montney region alone leaks more than 111,800 tonnes of methane into the air every year. This is the climate pollution equivalent of burning more than 4.5 million tonnes of coal or putting more than two million cars on the road” (11) The Montney region represents 55% of total gas production in BC.

The 111,800 tonnes of methane from the Montney region only reflect those lost during the extraction and transportation process. What has not yet been calculated is the greenhouse gasses created once the natural gas reaches the liquefaction facility in Kitimat where it must be compressed for tanker transport.

LNG Canada plans to use some BC Hydro grid electricity, but only to keep the lights on; the liquefaction process itself would burn gas. To become a liquid, natural gas is cooled to -163 Celsius and it takes up to 10 percent of the gas fed into the plant to power the cooling of the other 90 percent. So, to liquefy 100 m³ of natural gas, you need about 10 m³ of natural gas. Several cryogenic units equipped with huge turbocompressors are needed to compress and then expand propane in order to generate cold energy that is transferred directly to the feed gas to be cooled. (12) A 2017 article by Emma Gilchrist helps put this amount of energy into perspective:

“If those [LNG] plants used electricity to run their compression stations, just one large LNG plant would use roughly equivalent to all of the power from the Site C dam. But these plants won’t be using electricity for the most part — they’ll be burning gas to run compressors to cool gas into a liquid ready for transport to foreign markets.” (13)

The irony is that BC’s Clean Energy Act deems the burning of natural gas for household electricity too dirty, but LNG developers are exempt from this Act. The city of Vancouver itself has planned to phase out natural gas over the next decade.

THE GOVERNMENT SCIENTISTS REPORT BACK

In February of 2019, the Scientific Hydraulic Fracturing Review Panel, tasked by the BC Ministry of Energy, Mines, and Petroleum Resources, published its report. Journalist Andrew Nikiforuk's summary of the report explains that in, "232 pages, the word "concerns," as in "concerns regarding environmental impact," pops up more than 130 times." (14) He goes on to detail how the report concludes that scientists and the government simply do not know the impacts of fracking on groundwater, the climate, or human health, that they do not understand the radioactive hazards of fracking, and that they do not know if the industry-funded B.C. Oil and Gas Commission is a competent regulator. What the Panel did seem to understand is the increase in seismic activity as reported by Vaughn Palmer in the Vancouver Sun's summary of the report. He explains that the number of felt earthquake reports steadily increased from nine in 2016, 22 in 2017, to 52 in 2018. (15)

You can read the full Government Report here:

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-gas-oil/responsible-oil-gas-development/scientific_hydraulic_fracturing_review_panel_final_report.pdf

WHO IS TC ENERGY?

TC Energy (16), formerly TransCanada, has projects in so called Canada, the USA and Mexico. You may have heard of TransCanada as they also own the Keystone pipeline which moves tar sands bitumen from Alberta to the Southern coast of the USA. At the time of writing this, TC Energy's Keystone pipeline has been shut down since Oct. 29th, 2019 due to a spill of over 1.4 million litres (383,000 gallons) of oil in northeastern North Dakota. (17) TransCanada also made news when segments of the Keystone pipeline were shut down in February of 2019 due to the spill of 1,800 gallons (6,814 liters) in Missouri (18), and when 407,000 gallons of oil were spilled in northeastern South Dakota in November of 2017. (19)

Keystone I, commissioned in 2010, leaked 35 times in the U.S. and Canada in its first year alone. (20)

TransCanada, TC Energy, has a track record of pressuring local governments into heavy handed tactics and tight relationships with law enforcement, criminalizing Indigenous people on their own lands. The Keystone XL project is a prime example.

Keystone XL crosses through the heart of Oceti Sakowin, where both the ACLU (21) and ColorLines reported (22) on the extreme repression of Indigenous peoples and their supporters. Rewire News reporter Audita Guha explains that, "Before jamming the anti-protest bills through toward the end of the legislative session, [South Dakota Gov. Kristi] Noem reportedly consulted TransCanada in February, but not any of the seven tribal nations in South Dakota." (23) For TC Energy, this appears to be business as usual.

WHAT DOES THE CGL PIPELINE MEAN FOR WET'SUWET'EN TERRITORIES

The Coastal GasLink pipeline poses irreparable damage to the planet's climate, the province's water, and to the Wet'suwet'en people and their territories. This project will open the still intact territories protected by the Wet'suwet'en to an expansion of increasingly invasive industrial extraction. While the Unist'ot'en Yintah of Talbits Kwah has been and is logged, it is otherwise pristine and elders have noted even the logged forests are restoring themselves, animals are returning, and medicine is growing. The river Wedzin Kwah is still clean; you can cup your hands and drink from it. With the opening of the territory all of this will be lost.

Mineral and petroleum exploration, mines and their tailing ponds, additional cutblocks, dams, industry roads, pipelines--we have seen the results over and over when Indigenous people are forcibly removed from their territory and industry invades.

A relevant example is that of the Blueberry River First Nation, coincidentally the First Nation whose territory covers the vast majority of the Montney Shale Formation. Journalist Christopher Pollon poignantly opens his article about the case with these words, "Their home was once a rich and vibrant landscape, capable of supporting their people into perpetuity. But now the Blueberry River First Nations have brought B.C. to court to face the cumulative impacts of rampant oil, gas and forestry development that has left the land degraded, wildlife poisoned and Treaty 8 in tatters." (24) A lawyer for the First Nation likened the ongoing crisis on the land to "death by a thousand cuts".

In 2016 the Suzuki foundation and Ecotrust published a joint 86 page report documenting the cumulative land disturbances faced by the First Nation. The study found that since 2012,

“[t]he government of British Columbia has authorized construction in Blueberry River First Nations traditional territory of more than 2,600 oil and gas wells, 1,884 km of petroleum access and permanent roads, 740 km of petroleum development roads, 1,500 km of new pipelines and 9,400 km of seismic lines. Also since that time, approximately 290 forestry cutblocks were harvested in the Nation’s traditional territory.” (...)

and that

“Based on government data, 73% of the area inside Blueberry River First Nations traditional territory is within 250 metres of an industrial disturbance, and 84% is within 500 metres of an industrial disturbance.” (25)

Legal action by the Blueberry River First Nation against the government of BC dates back to 2015 and is grounded on the basis that the scale and rate of industrial disturbances authorized by the government prevents the First Nation’s members from meaningfully carrying out their traditional activities whose continuity was assured by the Crown under Treaty 8. (26)

The abandonment by the BC government of previous cooperation agreements had the First Nation back in the Supreme Court in the spring of 2019 suing the BC Government in a potentially precedent setting case that could completely disrupt the natural gas industry. A court decision is expected in 2020.

Disturbingly the construction of the Coastal GasLink pipeline only serves to expand gas infrastructure on the Blue River First Nation's territories and to further undermine their attempts to have the obligations of Treaty 8 respected.

This situation is not unique and other examples can be found everywhere. We need look no further than Fort McMurray, Alberta and the seemingly endless expansion of the Tar Sands on Dene and Cree territory. The inevitable result? Rivers no longer clean enough to cup one's hands and drink from.

CONCLUSION AND MORE RESOURCES

While the Government and Industry make claims about a clean and natural transitional fossil fuel they are obfuscating the complexity and dangers of LNG. Research over the last decade overwhelmingly shows that the struggle of the Wet'suwet'en and other grassroots Indigenous people to protect their territories from industrial expansion is in fact a fight to protect us all. With a warming planet, increasing droughts and expanding forest fires we cannot afford to sit by and watch.

We have touched on only a few of the major threats that projects like Coastal Gaslink pose to the future of life on this planet, however we have only discussed the very tip of the iceberg. If you want to learn more check out the additional resources below:

MAN-CAMPS AND INCREASED VIOLENCE TO INDIGENOUS WOMEN AND GIRLS

The Unist'ot'en respond to the construction of a Man Camp on their territory and the impacts this will have on their way of life:

<https://unistoten.camp/mancamps>

The Secwepemc, who are currently defending their unceded territories from the Trans Mountain pipeline project, provide information on Man Camps and many further resources:

<https://www.secwepemculecw.org/no-mans-camps>

Maclean's Magazine provides a brief summary of the National Inquiry into Missing and Murdered Indigenous Women and Girls Final Report's findings pertaining to resource development projects and Man Camps.

<https://www.macleans.ca/news/canada/mmiwgs-findings-on-man-camps-are-a-good-place-for-government-to-get-started/>

The full MMIWG report can be read here:

<https://www.mmiwg-ffada.ca/final-report/>

Honor the Earth produced a fact sheet about the impacts Man Camps to Indigenous women and girls living near TransCanada's (TC Energy) Keystone Pipeline.

http://www.honorearth.org/man_camps_fact_sheet

RISKS OF EXPLOSIONS AT LIQUEFACTION/ STORAGE FACILITIES

An overview of explosions, research and safety concerns:

<https://theyee.ca/News/2017/04/28/How-Safe-is-LNG/>

A 2014 Explosion at an LNG Facility in Washington State:

<https://www.scientificamerican.com/article/blast-at-liquified-natural-gas-site-casts-spotlight-on-industry-safety/>

In 2016 the findings from the Washington blast were still withheld from the public:

“Nearly two years ago, an explosion and massive gas leak at a liquid natural gas (LNG) facility in Plymouth, Washington, thirty miles south of the Tri-Cities, injured five workers and forced hundreds of people to evacuate their homes. To this day, state and federal oversight agencies have not published

the findings of their investigations into the accident, and the facts about what happened are almost completely unknown to the public.”

<https://www.sightline.org/2016/02/08/how-industry-and-regulators-kept-public-in-the-dark-after-2014-lng-explosion-in-washington/>

In 2004, an explosion at an Algerian LNG storage and liquefaction facility, caused by a leaking gas pipeline, “killed 27 people, injured 74 others, destroyed three of the six LNG trains at the complex, and heavily damaged a nearby berth for loading LNG tankers.”

<https://www.ogj.com/pipelines-transportation/article/17292920/algerian-lng-complex-explosion-caused-by-gas-pipeline-leak>

HEALTH IMPACTS NEAR FRACKING WELLS

Dr. Melissa Lem provides an in depth look at the concerns of Physicians working in Dawson’s Creek and around the Montney Shale Formation.

<https://thenarwhal.ca/potential-health-impacts-of-fracking-in-b-c-worry-dawson-creek-physicians/>

The Physicians for Social Responsibility, the US Affiliate of International Physicians For the Prevention of Nuclear War, winner of the 1985 Nobel Peace Prize, have compiled a Compendium, “which summarizes and links to an almost encyclopedic compilation of reports, peer-reviewed articles and investigative reporting on fracking’s dangerous impacts on health.” In June of 2019 its 6th edition was released.

<https://www.psr.org/blog/resource/compendium-of-scientific-medical-and-media-findings-demonstrating-risks-and-harms-of-fracking/>

This Rolling Stone Article summarizes the Compendium in 2018, opening with, a statement from the report, “Our examination...uncovered no evidence that fracking can be practiced in a manner that does not threaten human health,”

<https://www.rollingstone.com/politics/politics-news/the-harms-of-fracking-new-report-details-increased-risks-of-asthma-birth-defects-and-cancer-126996/>

FRAC SAND

This project by Canadian Premium Sand, would extract 1.2 million tonnes of sand every year for the next half-century, was excluded from federal review but approved by the Manitoba government in a process opponents say violated Indigenous rights.

<https://thenarwhal.ca/this-is-sacred-the-fight-against-a-massive-frac-sand-mine-in-manitoba/>

Citizens in Wisconsin raise concerns about health risks about Frac Sand mines.

<https://investigatamidwest.org/2019/03/21/residents-seek-answers-about-health-risks-near-frac-sand-mines/>

A short backgrounder on Frack Sands by the Sierra Club USA.

https://content.sierraclub.org/creative-archive/sites/content.sierraclub.org.creative-archive/files/pdfs/0497-FrackSandFact_01_low.pdf

CARIBOU EXTINCTION:

Michael Sawyer is arguing that the Coastal GasLink Project should have faced a federal review by the National Energy Board (NEB) instead of relying on provincial approval. He also wants a NEB review to look at how LNG Canada will affect caribou herds.

“There are caribou herds in northern B.C. that are protected under the Species At Risk Act that will go extinct if this project goes ahead,” Sawyer said.

<https://www.desmogblog.com/2018/10/02/michael-sawyer-legal-challenge-lng-canada-gas-pipeline>

The B.C. government has granted permits 78 logging cutblocks along the Coastal Gaslink Pipeline right of way. Scientists argue that these clearcuts will cause extinction for a protected caribou herd.

<https://thenarwhal.ca/deliberate-extinction-extensive-clear-cuts-gas-pipeline-approved-endangered-caribou-habitat/>

LNG TANKERS:

Most of the discourse around the risks posed by tankers on the coast of British Columbia is with regards to the TransMountain Pipeline and not about LNG tankers. That said LNG Canada expects 350 tankers a year, 50 more than the TransCanada Pipeline. The National Post points out,

“Among activists, the claim isn’t so much that the whales would be done in by an oil spill, but that the mere presence of more oil tankers would kill them with noise pollution and marine collisions (setting aside the thousands of other vessels that already cruise the

area). Under these parameters, an LNG vessel is just as dangerous to a killer whale as an oil tanker. The only difference is location: Trans Mountain ships would take a southern route, while LNG ships would go north through the territory of the Northern Resident Killer Whales, a population that is merely “threatened.” Still, it’s worth noting that while Ottawa has no problem filling the northern B.C. coast with LNG tankers, they’re simultaneously considering a permanent oil tanker moratorium for that same stretch of water.”

<https://nationalpost.com/news/canada/how-can-pipeline-hating-b-c-possibly-justify-all-these-lng-projects>

The Georgia Strait Alliance offers background information on the noise impacts of marine traffic on Orca Whales.

<https://georgiastrait.org/work/species-at-risk/orca-protection/southern-resident-orcas/killer-whales-are-drowning-in-noise/>

The Chemical Institute of Canada provides a summary of risks associated with LNG Tankers and vapour clouds caused by breached cargo tanks.

<https://www.cheminst.ca/magazine/article/risky-business/>

Journalist Graeme Pole describes the standards for LNG Tankers established by the Society of International Gas Tanker and Terminal Operators (SIGTTO) for the Common Sense Canadian,

“The default document on this topic is one created by the LNG industry itself. In 1997, the Society of International Gas Tanker and Terminal Operators (SIGTTO) published Site Selection and Design for LNG Ports and Jetties. The document is clear and succinct in describing how to enhance LNG safety:

- LNG ports must be located where LNG vapors from a spill or release cannot affect civilians.
- LNG ship berths must be far from the ship transit fairway to prevent collision, and since all other vessels must be considered an ignition source.
- LNG ports must be located where they do not conflict with other waterway uses now and into the future.
- Long, narrow inland waterways are to be avoided, due to greater navigation risk.
- Waterways containing navigation hazards are to be avoided as LNG ports.

Anyone familiar with the marine approaches to Prince Rupert and Kitimat will be aware that to propose marine transport of LNG from terminals in those harbours violates all of the SIGTTO standards referred to above.”

<https://commonsensecanadian.ca/prince-rupert-risk-Ing-tanker-danger-elephant-water/>

LINKS FOR INSIDE ARTICLE (BIBLIOGRAPHY)

- 1- <https://blogs.ei.columbia.edu/2014/06/06/the-fracking-facts/>
- 2- <https://thetyee.ca/Analysis/2019/11/07/UK-Ban-Taking-Down-Fracking-Industry/>
- 3- <https://www.vancouversun.com/pdf/shale-and-water.pdf>
- 4- <https://thenarwhal.ca/topics/fracking/>
- 5- <https://thetyee.ca/News/2018/08/30/Mega-Fracking-Industry-Water-Use/>
- 6- <https://commonsensecanadian.ca/toxic-fracking-waste-illegally-dumped-bc-water-treatment-system/>
- 7- <https://www.straight.com/news/1219081/elizabeth-phillips-bc-government-ignores-true-cost-Ing-canada-project>
- 8- (Full Academic Paper) <https://www.nature.com/articles/ngeo2919>
(Journalist Summary) <https://www.nature.com/articles/ngeo2919>
- 9- <https://www.vox.com/energy-and-environment/2019/8/15/20805136/climate-change-fracking-methane-emissions>
- 10- <https://www.policyalternatives.ca/newsroom/news-releases/suppressed-report-shows-hundreds-bc%E2%80%99s-fracked-gas-wells-may-leak-methane>
- 11- <https://davidsuzuki.org/press/new-science-reveals-climate-pollution-b-c-s-oil-gas-industry-double-government-claims/>
- 12- <https://www.cnbc.com/advertorial/2018/10/08/innovation-using-less-energy-to-liquefy-natural-gas.html> and <https://gate.nl/en/break-bulk/why-Ing.html>
- 13- <https://thenarwhal.ca/fact-checking-christy-clark-s-Ing-claims/>
- 14- <https://thetyee.ca/Analysis/2019/03/27/BC-Fracking-Report-Apprehension-Insufficient-Unknown-Concerns/>

15-<https://vancouver.sun.com/opinion/columnists/vaughn-palmer-science-panel-finds-b-c-doesnt-know-enough-about-fracking>

16-<https://www.tcenergy.com/operations/natural-gas/coastal-gaslink/>

17-<https://globalnews.ca/news/6134464/keystone-pipeline-leak-corrective-action-order/>

18-<https://apnews.com/234e4c25ff6149108ed0b3fe20e711a5>

19-https://www.aberdeennews.com/news/local/a-year-after-keystone-oil-leak-county-commissioner-is-content/article_ff7b038b-9cad-5090-b9a5-646e98e04fe5.html?block_id=475371

20-<https://www.audubon.org/news/keystone-oil-spill-raises-more-questions-about-pipeline-safety>

21-<https://www.aclu.org/blog/free-speech/rights-protesters/south-dakota-cant-silence-our-protest-against-keystone-xl>

22-<https://www.colorlines.com/articles/south-dakota-criminalizes-protest-against-keystone-xl-pipeline>

23-<https://rewire.news/article/2019/03/19/republicans-rush-to-outlaw-protests-against-oil-pipeline-in-south-dakota/>

24-<https://thenarwhal.ca/blueberry-river-death-by-thousand-cuts/>

25-<https://davidsuzuki.org/wp-content/uploads/2017/09/atlas-cumulative-landscape-disturbance-traditional-territory-blueberry-river-first-nations-2016.pdf>

26-<https://thenarwhal.ca/stung-by-derailed-negotiations-with-b-c-blueberry-river-first-nations-return-to-court/>