The Pipeline from Nowhere: WFLNG-FortisBC

Three lines of evidence indicate the Woodfibre LNG project will be six times (6x) larger than the public and the BC Environmental Assessment Office have been told.

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Woodfibre Liquefied Natural Gas (WFLNG) appears to have far bigger LNG export plans than they are admitting.

In section 2.4.1 of the WFLNG BC Environmental Assessment (BCEAO) application, WFLNG states, "The initial search for suitable project locations focused on sites suitable for a large-scale LNG facility *and potential for future expansion*." When queried as to whether or not WFLNG intends to expand this project, WFLNG's Vice President Corporate Affairs Byng Giraud's response has always been that *the plant will be sized according to the available gas supply.*

FortisBC, the company who will deliver the gas supply to WFLNG, has said throughout the EA process that expansion beyond what is currently proposed is possible, though FortisBC staff were unaware of any *formal* expansion plans. On March 21st, 2014, at a WFLNG/BCEAO Open House on Gambier Island, FortisBC Project Director Art Kanzaki publicly stated that in fact *there are plans to expand* the project beyond what is currently proposed.

Evidence that shows WFLNG is planning for a plant six times larger than they have described comes from the size of three parts of the installation that they are putting in place and that they are not mentioning in the Environmental Assessment (EA):

1. **The BC Hydro power upgrade** soon to be built for Woodfibre LNG will give it about 6x more power than it needs for present plans. (See "Woodfibre LNG Hydro Upgrade" in "Detailed Technical Explanations" below.) This BC Hydro upgrade is omitted in the EA.

2. **New and upgraded compressor stations** are much larger than would be needed for the project at the capacity described in the EA.

   Natural gas is moved through pipelines via compressor stations. The Fortis pipeline upgrade to supply WFLNG includes significant compressor station upgrades in three locations. These upgrades would provide far more compression than needed for what is currently proposed and more than enough compression to deliver 6x more gas than what is currently proposed. (See "Compressor Station Upgrades" in "Detailed Technical Explanations" below.)

3. **The proposed new pipeline only goes part way back to the Eagle Mountain compressor station in Coquitlam** and if/when completed, pipeline capacity, i.e., supply to WFLNG, would increase six-fold.

To export liquefied natural gas, WFLNG needs more natural gas than the old Woodfibre pulp mill received. To feed WFLNG, a new 24" natural gas pipe needs to be built. The proposed new pipe, starting north of **Indian Arm** in Port Moody would connect to an existing 25-year-old 10"–12" pipe and stretch 47 km back to Woodfibre. (See below "Map of Fortis' New Pipeline for Woodfibre" where red indicates new 24" pipeline and green indicates old pipeline.)

This odd, patched-together set-up has the new pipe starting out in the middle of nowhere, rather than starting at the source—Eagle Mountain Compressor station in Coquitlam. The 24" pipe will serve only WFLNG. The set-up does not make sense—unless they are planning to add the missing section (Coquitlam to north of Indian Arm) later.

A possible route along Indian Arm would complete the 24" pipe. In 1989, six routes for the present old pipe between Coquitlam and Squamish were investigated. The eventual route along Coquitlam Lake (which provides Vancouver with drinking water) was very contentious. (See "Investigation of pipeline routes 1989." The map of the six different routes studied is on page 5 of the report.)

Conclusion

WFLNG says that their plant will be sized to fit available gas supply. FortisBC has admitted there are expansion plans. WFLNG is planning and paying for access to six times more electric power and six times more compressor station "push" than is needed for present plans. A completed 24" pipe from Coquitlam to WFLNG would give WFLNG six times the gas presently described in their plans.

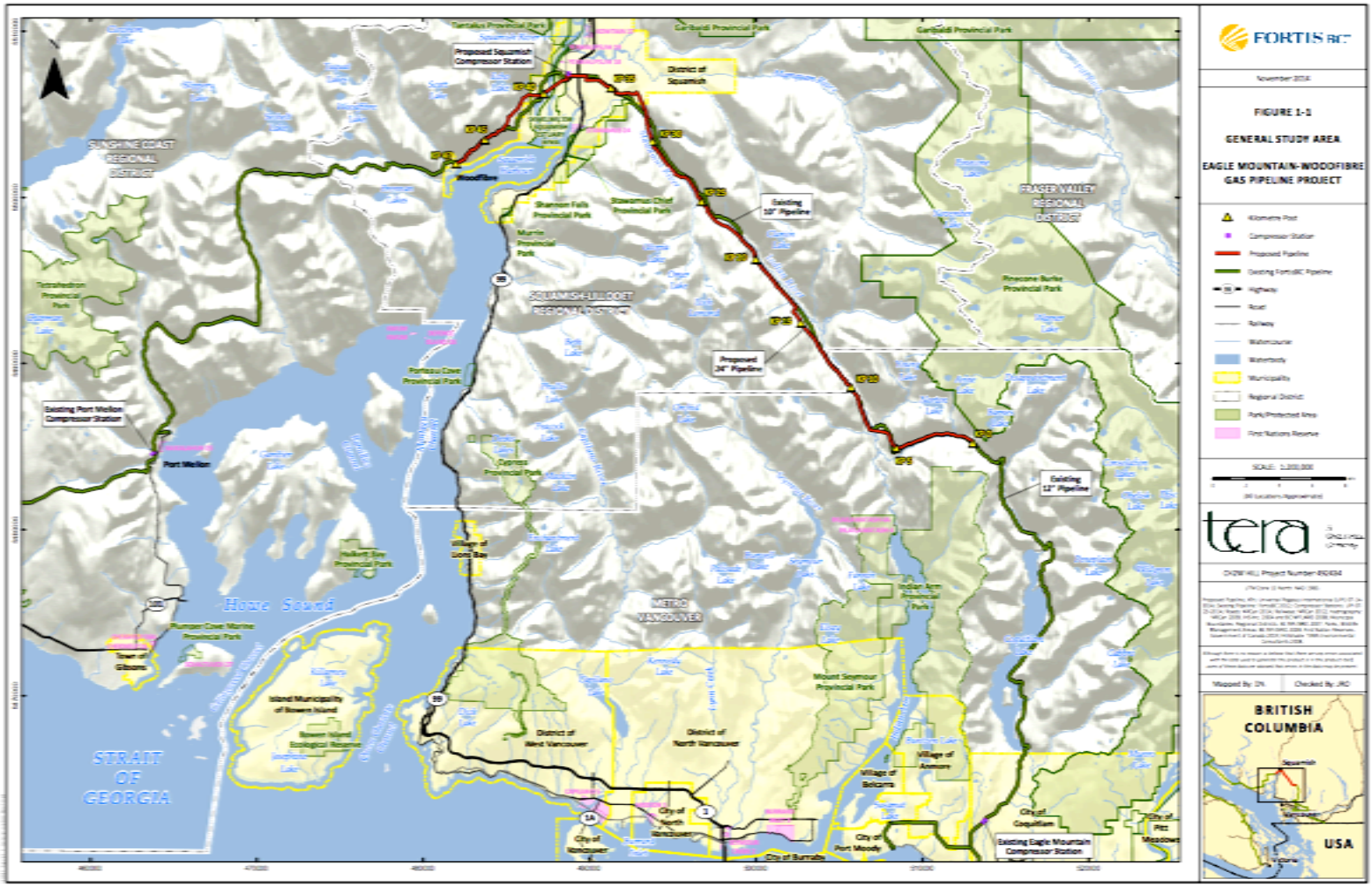
Implications

Present plan: LNG tankers will load 40x/year (40 trips = 1 trip in + trip out every 8–9 days or 1 tanker passing through Howe sound every 4–5 days.)
At 6x increase: LNG tankers will load 240x/year (240 trips = 1 trip in + trip out every 1.5 days or a tanker passing through Howe Sound **once every 18 hours**.)

Six-fold WFLNG expansion would significantly increase environmental impacts, wave impacts on Howe Sound beaches and infrastructure, and the serious public health and safety risks associated with tankers carrying massive volumes of highly dangerous, flammable cargo.

Expansion of existing facilities is subject to far less EA scrutiny than a "greenfield" proposal. (A greenfield project is one without any constraints imposed by prior work.) Other existing facilities have undergone recent expansions without much additional scrutiny by the BC Environmental Assessment Office, including Tilbury LNG, Mt. Hayes LNG, and Port Metro coal exports. Is WFLNG also counting on lax scrutiny for its expansionist plans?

Map of Fortis' New Pipeline for Woodfibre



red = new 24" pipeline
green = old pipeline

Detailed Technical Explanations

– written by Eoin Finn (PhD in Physics & Chemistry)

1. Woodfibre LNG Hydro Upgrade—not part of the WFLNG EA

At small-group meetings in June 2014, WFLNG said they can get 140 MW (via the current 138kV power line) from BC Hydro, which is sufficient for normal operations, through existing BC Hydro infrastructure. Yet WFLNG are exploring power upgrade options. Their stated rationale for upgrading the power supply is that meeting gas demands at peak use times would require more power for extra compression to move higher volumes of gas through the pipe.

The three power upgrades WFLNG is exploring with BC Hydro would all supply far more power than necessary, and the BC Environmental Assessment Office has confirmed that BC Hydro has included an assessment of the possible future power needs of WFLNG in their power upgrade proposal to WFLNG. See http://www.woodfibrelng.ca/wp-content/uploads/2014/08/Woodfibre-SGM1-Squamish-Meeting-Notes-June-16-2014.pdf , answers by Alex Brigden, WFLNG and Doris Huey, BC Hydro pg 4/5.

Infrastructure to support all three power upgrade options is already mostly in place.

- Options 1 and 2 would have WFLNG connect up with a 1,000kV service (2 x 500kV BC Hydro lines), which already runs past Woodfibre. This 1,000kV service has enough hydro to easily power a six-fold expansion of the LNG facility.
- Option 3 would use a beefed-up 230kV supply, which comes in via Port Mellon on the Sunshine Coast. The connection of the 230kV to WFLNG is not in place, and though that connection could be made quite easily, WFLNG would have to pay a great deal of money for this third option.
- WFLNG would also have to pay for the associated upgrade of Sechelt and Squamish Cheekeye substations.

The end result of any of the three power upgrade options is that WFLNG will have resilient (dual-sourced) 500kV service, which is far more than they would ever need for the size of the plant—as proposed. Details are at https://www.bchydro.com/energy-in-bc/projects/woodfibrelng/whats-being-done.html

2. Compressor Station Upgrades

Compressor stations push natural gas through pipes. Normal pressures for major gas trunk lines are 1200–1500 psi. The current 10”/12” pipeline that moves natural gas from Coquitlam to Squamish, Woodfibre, Port Mellon, and Vancouver Island is pressured to an already-high 2160psi.

The FortisBC plan adds 41,000 horsepower (BHP) compressors at Eagle Mountain (Coquitlam),

new 33,000 BHP compressors at Squamish, and a 6,000 BHP compressor at Port Mellon. The total new compression added to Fortis' system—80,000 BHP—is a huge amount of additional power for a pipeline whose throughput is restricted by the current 12" piping through the Coquitlam watershed.

This increase in compression power is inconsistent with the current limits of the pipeline, but entirely consistent with a 24" pipeline all the way from Coquitlam to WFLNG. A 24" pipeline from Coquitlam to WFLNG would facilitate a six-fold increase in gas supply to WFLNG—with a commensurate increase in risk and environmental damage.

3. Fortis Natural Gas Pipelines—Present and Future

The existing 10"/12" pipe, at its present operating pressure of 2160psi, can deliver roughly *1.6 million tonnes* of natural gas annually (MTPA) to Woodfibre. This capacity has to be shared with other customers in Squamish, Whistler, Sunshine Coast, and Vancouver Island. Woodfibre's license from NEB allows it to export *2.4 million tonnes* of LNG annually. However, the proposed 24" pipeline does not have the capacity to deliver the full 2.4 MPTA *and* maintain service to existing customers at times of peak demand. (Summer demand is low; winter demand is high.)

The constriction point in the current supply chain is Fortis' 12"-diameter pipe running north from Coquitlam through the Coquitlam Lake watershed. (Coquitlam Lake supplies Vancouver with water.) The 12" pipe has been there since 1990 and was very controversial even back then, occasioning a judicial review and the imposition of strict construction conditions by Judge Douglas McKay.

The now-proposed 24" pipe starts roughly 22km north of the north end of Coquitlam Lake. In a Y-junction connection point, both it and the 10" pipe would be served by the 12" pipe from Coquitlam running through the watershed. Fortis is calculating that the "twinned" combination, i.e., the 12" pipe and the new 24" pipe, plus increased compression at Coquitlam (Eagle Mountain station pushing) and the new compressor station at Squamish (pulling) will be enough to bring the gas delivery up close to the 2.4 MTPA demand from WFLNG, plus meet other-customer demands. That, in physics/engineering terms, is a long shot and risks over-pressuring and rupturing the 12" section through the Coquitlam Lake watershed. That is not a safe scenario.

Why would WFLNG spend vast amounts of money upgrading infrastructure and building half a pipeline that would be inadequate to deliver the full 2.4 MPTA it wants and still maintain full service to existing natural gas customers—all the while incurring significant risk? Will this later be used as the excuse to finish the pipeline—and thereby expand its capacity six-fold?

Fortis' alternative is to add more 24" pipe to complete the new 24" pipeline from north of Indian Arm to Coquitlam. It is unlikely that Metro Vancouver would ever allow this 24" pipe through its watershed. The alternative—considered in 1989, but slipped to second place because it was slightly more costly—is through Indian Arm. That is Tsleil-Waututh traditional

territory, and, in part, a provincial park, so permits won't be easily obtained. Nevertheless, Fortis has requested access to a barge landing area in Indian Arm, so they can haul the 24" pipe, the workers, and heavy equipment through there for the build. There is a BC Hydro landing ramp and a power-line access road there now.

In volume terms, a 24" pipeline at 2160psi, pushed along by enough compressor power, can carry 6x the volume of gas as the current mostly 10" pipe. That's approximately 10–12 MTPA. The math is fairly simple: the volume of a cylinder is proportional to the square of the radius, so 12" squared (144) is just under six times 5" squared (25).

WFLNG has always said it will use all the gas it can get and has pushed its engineers/designers to always consider how the plant can be expanded. Every engineer I have shown this to (that's a few) thinks that the extension of the 24" pipe all the way to Coquitlam is pretty much a requirement of the current plan, despite Fortis/WFLNG's (current) proposed partial solution. The full 24"-pipe run from Coquitlam to WFLNG would enable six-fold expansion of WFLNG without much additional EA scrutiny.

Since the new 24" pipeline would be inadequate to deliver the full 2.4 MPTA to WFLNG and to maintain full service to existing FortisBC natural gas customers at peak times, one has to wonder whether the gap in available gas will quickly become WFLNG's rationale for pipeline expansion. It seems that WFLNG wants to get things started, going with the permit that's easier to get—initial partial twinning—and that fits with later expansion.

Eoin Finn and Laurie Parkinson have partnered with many other volunteers at My Sea to Sky (Myseatosky.org), Future of Howe Sound (futureofhowesound.org), and Concerned Citizens Bowen (ccbowen.ca) to learn intensively about Woodfibre LNG over the last year. They all live in Howe Sound and care a great deal about the future health of this beautiful area, only recently recovered from industrialization.

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