

FRASER RIVERKEEPER



December 3, 2013

To: Port Metro Vancouver

Comments on SNC – Lavalin Environmental Impact Assessment for the Fraser Surrey Docks Direct Transfer Coal Facility

We are grateful for the opportunity to respond to the recent Environmental Impact Assessment (EIA) published by SNC-Lavalin on the potential impacts of the coal transfer facility at the Fraser Surrey Docks (FSD).

Fraser Riverkeeper and members of the sport-fishing community, along with other economic and recreational users of the watershed, are very concerned about the proposed FSD coal transfer facility, and in particular by the recent Environmental Impact Assessment contracted to construction company SNC-Lavalin.

By way of background, the Lower Fraser is part of the migratory route for five species of Pacific salmon, and over thirty other species of fish. It is also home to one of the last populations of white sturgeon (*Acipenser transmontanus*) in North America, currently listed as endangered by the federal Committee On the Status of Endangered Species In Canada (COSEWIC). This is a concern of particular note dealt with in more detail below.

It is perhaps worth mentioning at the outset that SNC-Lavalin itself is a construction corporation that has a vested interest in downplaying the risks posed by coal transfer projects.¹ Not only does this EIA give no estimate for the amounts of fugitive coal dust it will inevitably produce, it offers no clear understanding of how coal wastewater (coal-dust-laden water generated by washing equipment, dampening coal piles etc) will be treated, to what degree, and in what amounts it will be produced.

What follows are a few comments for your consideration.

¹ As their own website states: *SNC-Lavalin has worked on coal projects around the world, including the ongoing expansion of one of the largest mining operations in the world.* <http://www.snclavalin.com/expertise.php?lang=en&id=80&sub=1>

PAHs and Other Coal-Borne Pollutants: Risks to Herring, Salmon, Sturgeon and Orca

Powder River thermal coal is softer than the BC-sourced metallurgical coal generally exported from Metro Vancouver, and more likely to be blown into the water and air, whether dust-dampening surfactants are applied or not.

With transfer shipments of four million to eight million tonnes per year, even if the FSD facility is able to keep fugitive coal (from dust, spills and wastewater) to an annual maximum of one part in ten thousand— which is an optimistic figure— that means 400,000-800,000 kilograms of coal per year escaping into the air and aquatic ecosystems. That's over a ton of coal per day, every day. To get a sense of what a kilogram of coal looks like, imagine a dinner plate heaped about four inches high. Crush that into particulates and fine dust and multiply by 400,000 annually.

Thermal coal dust and any spills stand to affect sediment and water quality in the Fraser estuary: coal contains significant quantities of arsenic, cadmium, lead, and mercury, as well as high levels of polycyclic aromatic hydrocarbons (PAHs) which are recognized as dangerous carcinogens. These substances can bioaccumulate in the food chain, from herring to salmon to orcas and beyond.

Studies on the effects of PAHs in the freshwater and marine environment² show that PAHs are particularly harmful to herring embryos, resulting in skeletal defects, impaired swimming and death. A 2002 study noted that PAHs adversely affect the immune systems of salmon.³ Herring and salmon are of course critical to the food chain in the Fraser River and the Pacific coast generally. The dangerous effects of PAHs on aquatic organisms are why creosote pilings are being removed from BC waters, Puget Sound and from waterways across North America. We should not be going backwards and allowing huge quantities of them to escape into our rivers, estuaries and oceans.

One of the most alarming features of this project is that the area offshore and downstream of the proposed FSD facility (from Barnston Island to the tip of Annacis Island) is critical rearing habitat for juvenile sturgeon, as demonstrated by test catches in 2008 and 2009.⁴ The population of white sturgeon in the Lower Fraser has plummeted by 25% since 2003⁵, with a severe failure of the species to “recruit” sufficient numbers of juvenile fish. This issue has not been sufficiently addressed in the EIA.

Like herring, sturgeon larvae are particularly sensitive to chemicals. They are vulnerable to bioaccumulation of pollutants; studies of Lower Fraser white sturgeon dating as far back as the seventies⁶ show elevated levels of PCBs and DDT, as well as the presence of hydrocarbons, and such pollutants may factor in their dangerously low reproduction levels in the past ten years.

Concerns extend to marine mammals as well. Our Southern Resident orcas, like the belugas in the St. Lawrence River, are already among the most contaminated mammals on the planet. They are not

² Carol A Vines, Thea Robbins, Frederick J Griffin, Gary N Cherr, The effects of diffusible creosote-derived compounds on development in Pacific herring (*Clupea pallasii*). *Aquatic Toxicology*, Volume 51, Issue 2, December 2000, Pages 225-239, ISSN 0166-445X, 10.1016/S0166-445X(00)00107-7.

³ M.R. Arkoosh & T. K. Collier. Ecological Risk Assessment Paradigm for Salmon: Analyzing Immune Function to Evaluate Risk. *Human and Ecological Risk Assessment: An International Journal*, Volume 8, Issue 2, 2002, Pages 265-276. DOI:10.1080/20028091056908

⁴ <http://www.frasersturgeon.com/media/juvenile-habitat-2009.pdf>

⁵ http://www.vanmag.com/News_and_Features/Environment/Fishing_for_Answers

⁶ Johnston, N. T., L. J. Albright, T. G. Northcote, P. C. Oloffs, and K. Tsumura. 1975. *Chlorinated hydrocarbon residues in fishes from the lower Fraser River*. Technical Report no. 9. Westwater Research Centre. University of British Columbia, Vancouver, B.C. 31 p.

isolated from pollutants that gather in Fraser River sediments, as noted by Fisheries and Oceans Canada:

Sediment dredged from the lower Fraser River and other locations is periodically disposed of at marine sites in coastal British Columbia, both within and outside killer whale Critical Habitat. Sediments contain complex mixtures of contaminants, and material intended to be disposed of at sea is screened for a select list of contaminants. Because killer whales are long-lived and occupy a very high trophic level, they are at particular risk to accumulating high concentrations of PCBs and related compounds.⁷

Fugitive Coal and the Aquatic Environment

The EIA's position that the proposed coal facility will not harm Fraser River fish or other aquatic animals downstream or in the Strait of Georgia appears to be based on three assumptions. First, the belief that coal dust will not escape in any significant amount from their operations, drawn apparently from an undocumented assertion that surfactants and dampening constitute effective preventions of fugitive coal dust, even in a region as rainy and windy for much of the year as Metro Vancouver. Second, that water volumes will sufficiently dilute toxic metals and PAHs and flush them from the area, and third, that in the event of a coal spill, that the Fraser's waters are not acidic enough to leach out the metals and PAHs from escaped coal once it is in the river:

With respect to spills of coal into the aquatic environment during operation, trace elements and PAH in unburned coals proposed for handling at FSD would not be considered harmful to aquatic life because these constituents are generally not bioavailable under typical environmental conditions. For example, acidic pH (2.0 to 3.0) and basic pH (11.0) can result in leaching of selected metals from the coal matrix, however these conditions are not expected in the receiving environment.⁸

We take issue with all three of these assumptions.

COAL DUST: TRAIN CARS, FSD OPERATIONS, AND BARGES

In the matter of coal dust, surfactants are of limited use, and mainly exist as a stopgap to avoid the cost of properly containing coal in covered rail-cars. We already know that local coal trains lose major amounts of coal dust, as seen clearly in the citizen's video shot of the coal train in Delta,⁹ and from Burlington Northern-Santa Fe Railway Corporation (BNSF) who themselves published the results of a study that each car can lose over 500 lbs of coal in transit:

The amount of coal dust that escapes from PRB coal trains is surprisingly large. While the amount of coal dust that escapes from a particular coal car depends on a number of factors, including the weather, BNSF has done studies indicating that from 500 lbs to a ton of coal can escape from a single loaded coal car. Other reports have indicated that as much as 3% of the coal loaded into a coal car can be lost in transit.¹⁰

⁷ http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/resdocs-docrech/2010/2010_116_e.pdf

⁸ SNC – Lavalin Environmental Impact Assessment for the Fraser Surrey Docks Direct Transfer Coal Facility, p. 91

⁹ <http://globalnews.ca/news/741372/video-showing-coal-dust-coming-off-train-in-delta-is-uncommon-says-cp/>

¹⁰ <http://www.coaltrainfacts.org/docs/BNSF-Coal-Dust-FAQs1.pdf>

Surfactants wear off over the course of the 1600 km trip from Montana's Powder River Basin, which is why the EIA notes that BNSF has been asked in this case to reapply them halfway to Surrey; if surfactants wear off sufficiently halfway to merit reapplication, one can assume they will be ineffective by the time the cars arrive in Metro Vancouver.

Trusting surfactants to reduce coal dust on open rail cars and barges is a faith-based proposition, particularly when you consider our rainy, windy conditions that prevail in this area for much of the year. The rail cars follow Boundary Bay for many kilometers, and will be parked on spur tracks next to the Fraser on a near-permanent basis. An Oregon study¹¹ showed that coal dust can travel 500m to 2km from train tracks.

As for the facility itself, the EIA contemplates dealing with dust via unspecified "dust suppressants," site cleaning and "misting and sprinkling."¹² These may offer some mitigation, but it is impossible to prevent coal dust from escaping such an operation.

A figure of one part lost in 10,000 is, again, generous, and the FSD facility would be lucky to hit that level on site; but then there is the matter of the 150km barge trip to Texada. Like rail-cars, these barges are uncovered, with only surfactants as a means of controlling fugitive coal dust.

The EIA states they will not operate barges in winds over 40 km/hr, but there is no indication as to how will this be tracked and enforced. Barges cannot, unfortunately, be pulled out of the water or covered with tarps when the wind kicks up; and winds change by location and by the hour.

DILUTION AND LEACHING

The assertion that river volumes and flow render coal pollution inconsequential is wishful thinking. Adding 400,000 to 800,000 kilograms of heavy-metal and PAH-bearing coal into our ecosystem annually will only exacerbate the ecological stresses already faced by our regional stocks of herring, salmon, sturgeon and marine mammals such as orca. That such dust may be in motion in the flow of the river does not negate its presence to the species that live in the river, particularly when the project will produce coal dust every day, month after month, year after year, for as long it exists— and all of this material that ends up in the river will be flushed into our harbours, estuaries and marine ecosystems.

As for coal's resistance to leaching, even if it is possible that unrecovered chunks of spill coal left in the Fraser for years will never leach their pollutants, an assertion that seems highly dubious and in need of serious scrutiny, the same cannot be said for coal dust that enters the water column. A 2008 study by the University of Vienna has singled out coal operations as significant sources of PAHs in aquatic environments:

*Numerous environmental polycyclic aromatic hydrocarbon (PAH) sources have been reported in literature, however, unburnt hard coal/ bituminous coal is considered only rarely. It can carry native PAH concentrations up to hundreds, in some cases, thousands of mg/kg... The extractable phase may be released to the aquatic environment, be available to organisms, and thus be an important PAH source.*¹³

¹¹ http://media.oregonlive.com/environment_impact/other/Coal%20Report%20.pdf

¹² SNC – Lavalin Environmental Impact Assessment for the Fraser Surrey Docks Direct Transfer Coal Facility, p. 161

¹³ Achten C, Hofmann T. *Native polycyclic aromatic hydrocarbons (PAH) in coals - a hardly recognized source of environmental contamination*. Sci Total Environ. 2009 Apr 1;407(8):2461-73. doi: 10.1016/j.scitotenv.2008.12.008. Epub 2009 Feb 4.

Wastewater and Run-off

As previously mentioned, the report notes that water— apparently massive amounts of it, though the actual amounts are not given—will be used for dust suppression. The report states the resulting wastewater will be recycled "as much as possible," but that in times of heavy rainfall, "there is potential for a surplus of drainage wastewater"¹⁴ that will either go into the Metro sewer system, or into the Fraser River, once the pH has been "adjusted" with chemicals (begging the question of what chemicals these will be) and solids removed.

But the EIA does not say how much untreated wastewater will end up in the river, or what threshold levels will be met for filtering out particulates, heavy metals and PAHs.

Long-term Impacts for Fisheries: Acidification

Lastly, sportfishermen and other users of our fisheries resources are concerned about the long-term "blowback" from China. When burned, the carbon in coal combines with oxygen to create atmospheric CO₂. Thermal coal typically contains up to 78% carbon¹⁵, and burning one tonne of thermal coal with this amount of fixed carbon generates 2.86 tonnes of atmospheric CO₂.¹⁶

If FSD ramps up exports to eight million tonnes of coal per year, the result will be the production of 22.9 million tonnes of CO₂ per year, causing localized air-pollution in China as well as long-lasting global greenhouse effects.

Most worrying for sport and commercial fisherman is the acidification of our oceans and lakes: global burning of coal is causing our waters to become more acidic, as 30-40 percent of human-created atmospheric CO₂ dissolves into them and lowers their pH. "It doesn't matter where the coal is burned," said Bob Rees, executive director of the Northwest Guides and Anglers Association in an interview. "It's having monumental effects on the ocean."

In sum, this proposed project poses risks to our aquatic species and habitat that have not been properly or duly accounted for in the EIA. It is our conviction that the ecosystem costs — the inevitable injection of hundreds of thousands of pounds of toxic particulates into our air and water year after year—far outweigh the potential economic benefits.

Sincerely,

Tyee Bridge
Riverkeeper and Campaign Director,
Fraser Riverkeeper

¹⁴ SNC – Lavalin Environmental Impact Assessment for the Fraser Surrey Docks Direct Transfer Coal Facility, p. 29

¹⁵ http://www.engineeringtoolbox.com/classification-coal-d_164.html

¹⁶ http://www.eia.gov/coal/production/quarterly/co2_article/co2.html