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Joe Daniels, Riverkeeper
Fraser Riverkeeper
90 - 425 Carrall Street
Vancouver, British Columbia, V6B 6E3
Tel: 250-600-6262
joe@fraserriverkeeper.ca

Grant McGillivray
Liquid Waste Regulatory Program Lead
Regulation & Enforcement Division
Metro Vancouver
4330 Kingsway
Burnaby, British Columbia, V5H 4G8
regulationenforcement@metrovancover.org

RE: Fraser Surrey Docks Direct Transfer Coal Terminal Wastewater Discharge Application

Hello Mr. McGillivray,

Thank you for taking the time to read this letter. Fraser Riverkeeper is grateful to have this opportunity to comment on the Application by the Fraser Surrey Docks (FSD) for a Sanitary Sewer Waste Discharge Permit pursuant to Metro Vancouver Sewage Bylaw 299, in order to discharge wastewater from their proposed Direct Transfer Coal Facility into the Metro Vancouver Sewer System. We are concerned that the Application overlooks several major points, in particular the presence of critical rearing habitat for the Lower Fraser River's population of endangered White Sturgeon in the area immediately downstream of the proposed Facility, as well as a lack of consideration for the potential impacts of wastewater runoff and discharge from this Facility's operations on fish and fish habitat in the project's Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). Furthermore, we would like to support and expand upon the concerns raised in letters sent July 7th and 21st, 2014, by Communities and Coal (C&C) and Voters Taking Action on Climate Change (VTACC) in regards to the Application's

inaccurate portrayal of the post-treatment wastewater that the Application proposes to discharge into Metro Vancouver Sewers^{1,2}.

Fraser Riverkeeper is a registered charity and the only BC member of the international Waterkeeper Alliance, founded by Robert F. Kennedy Jr. Our mission is to ensure clean, swimmable, drinkable, fishable water for all in BC. We are founding members of the Waterfront Initiative with the Georgia Strait Alliance, bringing together concerned stakeholders from along the Metro Vancouver Waterfront. We have also partnered with the sport fishing community, along with other economic and recreational users of the Fraser watershed, to provide commentary on the potential ecological impacts posed by FSD's proposed Coal Facility; submitting a letter to Port Metro Vancouver commenting on the project's EIA on December 3rd, 2013.

We respectfully ask that you seriously consider the following points before you move forward with approving the Application for wastewater discharge from FSD's Coal Facility.

1. Fraser River White Sturgeon a Species of Special Concern

The Fraser River is home to one of North America's only three remaining populations of White Sturgeon (*Acipenser transmontanus*). These incredible animals, survivors from the Mesozoic era who swam alongside dinosaurs, are the largest and longest-lived North American freshwater fish species; achieving lengths of over 6 meters and weights in excess of 600 kilograms. Their lives can span more than 150 years, making certain elderly individuals older than British Columbia's membership in the Dominion of Canada.³

First Nations living on the banks of the Fraser River have traditionally harvested sturgeon since time immemorial, their huge bodies providing them with a veritable cornucopia of resources; from food and medicine to tools and drum-skins⁴. However, with the arrival of Europeans came an industrialized commercial fishery that decimated the Lower Fraser's sturgeon stock during the late 19th and early 20th centuries, bringing these survivors from our province's prehistoric past to the brink of extinction. Provincial and Federal agencies acted together to ban commercial and recreational sturgeon fishing on the Fraser in 1994, but with White Sturgeon females taking up to 18 years to reach sexual maturity, and males as much as 14, they have been slow to recover from this industrial-scale slaughter. Meanwhile, a variety of new pressures resulting from the industrialization and urbanization of the Fraser River watershed over the past century, from toxic pollutants to habitat loss, have served to further hinder their recovery. COSEWIC first evaluated White Sturgeon in 1991, listing them as a "species of concern". The collection of a considerable amount of data over the ensuing decade contributed to an updated

¹ Communities & Coal; RE: Fraser Surrey Docks Waste Disposal Permit Application; submitted July 7th, 2014.

² Voters Taking Action on Climate Change and Communities & Coal; Re: Comments on Fraser Surrey Docks' Application for a Sanitary Sewer Waste Discharge Permit - Submitted November 19, 2013, Reference: 4419; submitted July 21st, 2014.

³ Ministry of the Environment; Fish & Habitats - White Sturgeon (*Acipenser transmontanus*) in British Columbia; <http://www.env.gov.bc.ca/wld/fishhabitats/sturgeon/>

⁴ HSBC Fraser River Sturgeon Education Program - First Nations Stakeholders; <http://hsbc.frasersturgeon.com/rhspsec/Lesson3-6/Lesson4/Lesson4/Shback/FNation.pdf>

status report, published in 2003. This re-evaluation led COSEWIC to Red-List White Sturgeon as endangered in Canada⁵.

Unlike salmon, dying after a single spawn, a mature sturgeon can breed continuously throughout their lifetime; with large, fertile females laying up to 4 million eggs at a time⁶. When one takes this into consideration, along with the length of time it takes juvenile sturgeon to reach sexual maturity, the importance of protecting the critical rearing habitat of this endangered species becomes clear. However, despite a 2009 report from the Fraser River Sturgeon Conservation Society showing that the habitat between Barnston and Annacis Islands, immediately downstream of the proposed facility, is utilized by maturing juvenile White Sturgeon⁷ both the EIA and EMP for the FSD Coal Facility omit any reference to the potential impacts of its operations on juvenile sturgeon or their habitat. Of further concern is that White Sturgeon, a species on the COSEWIC Red List which the above-mentioned study proves to occur in the vicinity of the proposed Facility, is absent from FSD's EIA *List of Wildlife with Special Status* (Volume III, Appendix XII).

Section 5.5 of FSD's EIA, *Fish and Fish Habitat*, acknowledges the presence of all five of the Fraser River's wild Pacific salmon species, as well as Rainbow and Cutthroat Trout, and as many as 15 species of special concern in the immediate vicinity of their proposed Facility; however, FSD's EIA *Metro Vancouver Wildlife List* (Volume III, Appendix X) does not include any fish species whatsoever. Furthermore, section 5.5 acknowledges several potential impacts on fish and fish habitat resulting from Facility construction and operations, including fish mortality and habitat destruction as a result of accidental spills of hazardous chemicals and unburned coal into the aquatic ecosystem, as well as the potential for fish mortality as a result of pile driving activities and the anticipated loss of 0.10 hectares of riparian and aquatic habitat. But, with the exception of restoration work scheduled for Shadow Brook and efforts to reduce the impacts of pile driving, mitigation efforts for the facility's operations are largely restricted to spill prevention, emergency spill response, and regular barge inspections. Neither the EIA, EMP, or Mitigation Plan for FSD's proposed Facility appear to take into account the potential threats posed to fish and fish species by the escapement of fugitive coal and coal dust from Facility operations, runoff from dust-suppression operations entering the Fraser River watershed, and the discharge of post-treatment wastewater into the Metro Vancouver Sewer System. Section 3.8 of their EMP, titled *Vegetation and Wildlife Protection Plan*, simply states that "Given the developed nature of the site, impacts on vegetation and wildlife are not anticipated"; while Section 5.5 of FSD's EIA boasts that their focus on prevention makes accidental spills "unlikely", therefore "residual effects on fish or fish habitat are not expected from the operation of the proposed Project". We respectfully disagree with this assessment for reasons that will become clear with our following points.

⁵ Ministry of the Environment; *White Sturgeon in British Columbia - Frequently Asked Questions on the status and consequences of listing*; <http://www.env.gov.bc.ca/wld/documents/whsturgeonfaq.pdf>

⁶ Ministry of the Environment; *Wildlife in British Columbia At Risk - White Sturgeon*; <http://www.env.gov.bc.ca/wld/documents/sturgeon.pdf>

⁷ Glova, et al.; *A Further Report on Juvenile White Sturgeon Habitat Use in the Lower Fraser River, 2008-09*; March, 2009; http://www.frasersturgeon.com/media/juvenilesturgeonhabitat2008-09_reduced.pdf

2. Bioavailability of Particulate Coal to Benthic Feeding Fishes

Letters previously sent by C&C and VTACC have provided excellent commentary on the considerable flaws in FSD's assessment of the potential quantities of toxic metals and Polycyclic Aromatic Hydrocarbons (PAHs) in the wastewater generated by the proposed Facility. In their July 21st letter, C&C and VTACC pointed out that the Coal Water Analysis outlined on pages 7 and 8, as well as at Attachment 2, of the Application which forms the bulk of FSD's justification for not seeking a permit to discharge Prohibited or Restricted Wastes contains a number of deficiencies. Chief among these is the Analysis' reliance on precipitation data utilizing a pH that is inconsistent with what is common for the Lower Fraser Region, as well as the fact that the Analysis relies on the assumption that, since Total Suspended Solid (TSS) discharged will not exceed 600 mg/L, concentrations of "total metals, phenols, volatile organic compounds (VOC), sulphate, polycyclic aromatic hydrocarbons (PAH) BOD 5, and pH" that will be present in the wastewater discharged from the Facility can be accurately measured by examining a 600 mg/L TSS solution of Powder River Basin coal in water over a period of two weeks. C&C and VTACC pointed out that this assumption is flawed as it fails to take into account that more dissolved metals are likely to leach into the wastewater as it moves through the operation and sits for extended periods of time in the settling pond prior to discharge. Furthermore, In their July 7th letter, C&C included a comparison of FSD's analysis of the metal content of Powder River Basin Coal to their own independent analysis conducted by ALS laboratories and data from the U.S. Geological Survey (USGS). This comparison showed a significant disparity, with C&C's independent analysis displaying levels of Arsenic and Lead significantly higher than those presented by FSD's analysis.

Polycyclic Aromatic Hydrocarbons are organic compounds that occur naturally in bituminous fuels such as coal and crude oil that are known to have carcinogenic and mutagenic properties⁸. PAHs are also suspected endocrine disruptors. FSD's Coal Water Analysis displays total sample PAH concentrations of between 0.18 to 0.11 mg/L. However, a 2000 study of runoff and sediment contamination from an operating coal dock in Hamilton, ON, revealed suspended solid and total trace metal concentrations that often exceeded Canadian Water Quality Guidelines, as well as concentrations of PAHs fluoranthene, phenanthrene, pyrene, and chrysene often exceeding Ontario's "Severe Effect Level" for sediment⁹. All of this would serve to support the view that concentrations of PAHs in the FSD Facility's wastewater is likely to be much higher in reality than the Coal Water Analysis would seem to suggest.

Throughout their EIA, EMP, and Mitigation Plan, FSD maintains that PAHs in escaped coal are not likely to become biologically available. However, there is considerable evidence to prove that this statement is inaccurate. Firstly, elements such as PAHs become more biologically available since as the size of the particulate matter to which they are attached decreases, the surface area available for gastric acids to digest increases. As such, the fine particulate coal dust which the Facility's operations are expected to

⁸ United States Environmental Protection Agency; *Polycyclic Aromatic Hydrocarbons (PAH) Factsheet*;
<http://www.epa.gov/osw/hazard/wastemin/minimize/factshts/pahs.pdf>

⁹ Curran, et al.; *Suspended Solids, Trace Metals, and PAH Concentrations and Loadings from Coal Pile Runoff to Hamilton Harbour, Ontario*; 2000;
http://www.researchgate.net/publication/230084896_Hydrology_of_stockpiled_industrial_coal_exposed_to_rainfall/file/9c960529a8fa257f66.pdf

generate would be highly available. Finally, as the 2000 study from Hamilton, Ontario, illustrates, particulate coal escaping from the Facility's operation or suspended in its discharged wastewater will sink once it enters the Fraser River ecosystem; eventually settling into the benthic ecosystem at the river bottom. Here they will become especially available to benthic-feeding species, such as the White Sturgeon, who frequently ingest large amounts of indigestible sediment from the river bottom¹⁰. This sediment builds up in their stomachs, giving organic compounds contained within, such as PAHs, a much better opportunity to be absorbed into their tissues over time.

3. Surfactant Toxicity in Fish Species

In addition to our concerns in regards to PAHs, throughout the EIA, EMP, and Mitigation Plan for the proposed Facility, it is stated that "surfactants" or "dust suppressants" will be used to reduce fugitive coal dust. While we obviously agree that keeping dust from the Facility's operations to an absolute minimum is essential should FSD move forward with construction, the use of large quantities of surfactants in the dust suppression process raises some significant concerns for us in regards to the amounts of surfactants remaining in the treated wastewater discharged from the facility into the Metro Vancouver Sewer System, as well as the potential impacts from these chemicals on fish species should they reach the Fraser River's aquatic ecosystem.

In Volume II, Appendix II of FSD's EIA, Peter Macios (Executive Product Manager - Dust Control, GE Water and Process Technologies) states that surfactants "accelerate the wettability" of the coal, and that they are required to "minimize the moisture addition and maximize the coverage". He goes on to suggest that "a low dosage" added to the water sprayed on the coal will improve wettability, "allowing uniform coverage of all the coals".

Surfactants are widely used domestically and in industry as detergents, wetting agents, foaming agents, and dispersants. They are compounds which lower the surface tension between two liquids or a liquid and a solid. By lowering the surface tension of water, they can facilitate the formation of emulsions with otherwise immiscible liquids such as oils and fat¹¹. The vast array of synthetic surfactants in production today have a range of toxic chemical effects for fish species, but the one thing they all have in common is that they can damage the lipid components of cell membranes. Since surfactants reduce the ambient surface tension of the water, lipid cells become less water repellent and, therefore, become engorged. Long-term exposure can lead to cell damage and eventual necrosis. Furthermore, surfactant exposure can cause impaired gill function in fish, as well as damage the protective mucus membrane that covers their bodies, making them more susceptible to injury and infection.

The MSDS sheet for GE's dust suppressant product DUSTREAT DC6109, included in an earlier September 2012 draft of the project's EMP, lists a range of serious human health hazards posed by the product. Exposure can cause severe irritation to the eyes and skin, as well as irritation to the upper respiratory

¹⁰ Ministry of the Environment; *Wildlife in British Columbia At Risk - White Sturgeon*;
<http://www.env.gov.bc.ca/wld/documents/sturgeon.pdf>

¹¹ Svobodova, et al.; *Water Quality and Fish Health - 3.2.6 Sufactants*;
<http://www.fao.org/docrep/009/t1623e/T1623E03.htm#ch3.2.6>

tract when inhaled in an aerosol form. The most up-to-date version of the EMP from May 2013 includes the MSDS for another one of GE's DUSTREAT products, DC9148, exposure to which causes only slightly less irritation to skin and eyes than DC6109, but just as much to the upper respiratory system.

We, along with C&C and VTACC, have already pointed out the numerous deficiencies in the Coal Water Analysis that forms the core for FSD's justification not to pursue a permit to discharge Restricted Waste. The Analysis lists total concentrations for just one surfactant: methylene chloride; while measures of other surfactants listed as active chemicals in DUSTREAT DC6109 and DC9148, such as linear alkyl sulfonate, are not included.

The Application's EIA, EMP, and Mitigation Plan mentions the application and reapplication of dust suppressants and surfactants mixed with water throughout the Facility's operations, suggesting that, even if they are applied at a low dosage, a significant quantity of these chemicals are likely to be present in any wastewater. Furthermore, FSD's stated intent to reuse collected wastewater to spray down coal, presumably with the addition of even more surfactants as it is recycled through the system, also suggests that surfactant concentrations in the wastewater discharged from the FSD Coal Facility may be much higher than what is shown in the Coal Water Analysis.

In conclusion, Fraser Riverkeeper are deeply concerned about the potential for serious harm posed to fish by the release of high concentrations of synthetic surfactants into the Fraser Watershed, as well as the threat of PAH bioaccumulation posed to White Sturgeon and other benthic species from the release of large amounts of particulate coal dust into the ecosystem through wastewater discharge from FSD's proposed Facility into the Metro Vancouver Sewer System. Also, considering the location of the facility directly upstream from rearing habitat for the Fraser River's population of endangered White Sturgeon, we feel that FSD's failure to consider White Sturgeon in their EIA as a species of special concern is a critical oversight.

We recognize the importance to your office, as well as to the greater public good, that the decision to issue any permit be based on the greatest amount of information possible. As such, we respectfully ask that you delay your decision on issuing a Sanitary Sewage Discharge Permit to FSD's Coal Facility until the concerns raised in this letter have been properly addressed.

Again, we would like to thank you for taking the time to read our comments on the Application and for this opportunity to provide input to your office.

Kind regards,

Joe Daniels

Fraser Riverkeeper