

February 28, 2019

Hon. Margaret Miller
Environmental Minister
Environmental Assessment Branch
P.O. Box 442
Halifax, NS B3J 2P8

Dear Hon Minister Miller:

I am writing to you to express my concerns over Northern Pulp's document, Replacement Effluent Treatment Facility Report. In my opinion, the document does not contain enough facts or data to support an approval of the project. I recommend that you not approve the project at this time, but defer a decision until further information can be obtained.

My area of concern is erosion due to the expelling of the effluent into the strait and associated waters, and its effect on sea life and on property values. In the 1200 odd pages of report and appendices, I can find no definitive statement as to exactly where the pipe will be laid, or where the exit aperture of the pipe will be. The introduction of the effluent into the Strait will most certainly affect the flow fields of the Strait's waters. How much, where and how quickly are vast unknowns.

I personally have seen two homes, formerly here on Caribou Island, fall into the Strait because of a causeway that was built at the western end of the island some fifty years ago. At the time the causeway was designed and built, there was little consideration paid to the impact of a causeway on the flow fields of the Strait's waters around the western end of the island.

Accordingly, what was once almost a half mile of fertile farm land, extending from the north shore of the island into the Strait, has been eroded until almost no land exists north of certain sections of Caribou Island Road. Two homes, located on the northern side of the island, in the past 20 years have fallen into the Strait; in addition, a third home, sitting on a hill, has seen over forty feet of yard eroded back to the foundation of the home. No doubt it will also fall into the Strait at some time in the future.

I would think homeowners having homes destroyed by erosion caused by the pipe, would have a valid claim for reimbursement from the Province, since it would be clear the Province, i.e., your Department, did not exercise due diligence in examining the erosion question.

A simple qualitative experiment will demonstrate the impact of erosion. It will involve a garden hose, and a typical homeowner's yard. In part one of the experiment, connect the garden hose to a faucet, remove the nozzle from the hose, lay the hose down on the ground, and turn the water faucet on. As the water comes out of the hose, observe how much, if any, erosion occurs in the region immediately in front of and at some distances from the end of the hose. Observe the process for some period of time, say an hour. In part two of the experiment of the experiment, attach the nozzle to the hose, and repeat the above procedure, repeating the process for the same time as in part one. Compare the outcomes of the two parts. You will agree that part two produces more erosion than part one.

This effect of erosion can be simulated via computer, but it must be done by people who know what they're doing. Not just any programmer will do: the person writing the software must have a thorough understanding of the effects of changes in water physics (temperature and particulates in suspension) and chemistry (concentration mixture, precipitation) on sea life.

This simulation must solve the Navier-Stokes equation for the ejection of effluent into the Strait. The solution should be in three dimensions, over time. I suggest the simulation mesh be ten feet or finer, with a simulation period of twenty years. The volume covered should be from Pointe-Sapin, New Brunswick to Limestone Cove, Nova Scotia, across the strait to the PEI south coast from Cape Wolfe to East Point. Vertically, the simulation should be from the sea floor of the Strait to the surface. It should include both summer and winter (i.e., a frozen Strait) conditions.

Failure to pursue this simulation will open the Province up to a failure to perform due diligence concerning the loss of property values, and open the Province up to lawsuits from the three provinces, for loss of property values.

We can size this effort. Assume a simulation of the entire cape volume of interest at a specific point in time will take six minutes of computer time (a lifetime in simulation world). The Sampling Theorem says that, due to the tides (twice a day) there should be at least four simulations per day. For completeness and to eliminate aliasing, I suggest five per day. Five simulations per day times 365 days per year times 20 years times 0.1 hours of computer time per simulation is approximately 1.8 years of computer time (assuming the simulation is run 8 hours a day, five days a week) following the start of the simulation effort.

The effluent will contain both suspended solid particulate matter, of perhaps micron size or larger and dissolved liquid contaminants. Over time the solid particulate matter will, under the force of gravity, settle onto the seabed or onto the shores. For those who claim that the pipe will not contribute to erosion of the shores and sea bottom of the Strait, I suggest that throwing some sand and water at a mountain will not produce the effects of erosion, yet we know that over time, wind and sand can erode mountains down to small hills.

In summary, neither you nor your office has been provided enough information to make a due diligence decision.

Very truly yours,

Eugene McManus
Pictou, Nova Scotia