Submissions of the Friends of the Northumberland Strait in Response to the call for Public Comments on the Environmental Assessment of the Replacement Effluent Treatment Facility Project

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1. Overview

1. This submission is filed on behalf of our client, the Friends of the Northumberland Strait, a society registered under Nova Scotia's Society Act with a membership of Pictou residents and the Pictou County area community.

2. Northern Pulp Nova Scotia (NPNS) proposes a project to build a new Effluent Treatment Facility (ETF or the "project"). Please consider these submissions, and the accompanying appendices, as the comments of the Friends of the Northumberland Strait in relation to the Environmental Assessment (EA) process for the ETF.

3. The NPNS ETF is ill-conceived and is designed to externalize to the environment the costs of NPNS's enterprise. NPNS rejects the significant and viable alternative of installing a closed-loop system on the basis that it cannot make the same level of profits as it does with its current process.

4. The risks to the environment are too great to permit this project to proceed. Further, the application is a paper exercise rather than an in-depth investigation of an important ecosystem, and is missing crucial information. The application is based on inadequate and second-hand and often out-dated research and investigation, and relies on inappropriate methodology to make defective predictions. No significant effort was expended to measure and determine the actual conditions in the affected ecosystems. NPNS does not understand the environment in which it seeks to operate, it understates the risks of the project, and overstates the effectiveness of its proposed mitigation measures.

5. The risks are significant and NPNS has failed to discharge its burden to show that the project will not cause significant environmental effects or adverse effects, or that any such effects can be mitigated. The project proposes to discharge a daily average of 62,000,000 litres, and up to a maximum of 85,000,000 litres, of pulp mill effluent every day into the middle of the only herring spawning area in the southern Gulf of St. Lawrence. It will discharge effluent directly into lobster fishing grounds for as many as 82 local fishers, and could affect the lobster fishery for as many as 1800 lobster fishers from Nova Scotia and Prince Edward Island in the Strait.

It could have significant effects on the marine ecosystem and foundational species of the ecosystem, such as planktonic species, invertebrate and fish larvae, subtidal and intertidal invertebrates and plants, forage species and other marine organisms. There could also be significant human health impacts from air emissions, from contamination of freshwater, drinking water and soils, and from contamination and bioaccumulation of toxic substances in marine species and marine foods.

6. Further, the Minister has selected an EA process under the *Environment Act*[1] that does not permit sufficient time for the public and other affected groups and individuals to assess the voluminous materials filed by NPNS. NPNS has had four years to prepare this set of materials, but the public is given 30 days to respond. Provincial officials have worked closely with NPNS to develop the reports appended to NPNS's submission, but NPNS has chosen not to release them to the public until the last minute. Significant taxpayer funding has been provided to NPNS to develop the submission, but no corresponding funding has been made available to the public to hire their own scientific experts to review this submission. The Minister has acknowledged the unfairness of this process to the public[2], but appears content to push the matter to a quick conclusion.

7. As discussed in detail below, ample evidence is before the Minister to allow her to conclude that the project should be rejected, as it is likely that it will cause adverse effects or significant environmental effects that cannot be mitigated. Consequently the project should be rejected pursuant to section 34(1)(f) of the *Environment Act.*

8. In the alternative, the NPNS EA fails to provide information on many crucial aspects of the project. The Minister therefore does not have sufficient information and analysis before her to permit her to allow the project to proceed. Evidence of potential adverse effects or significant environmental effects that cannot be mitigated have been presented to the Minister from many sources within this EA process. Due to the multiple information gaps, lack of examination of significant issues, and lack of scientific support for the premises put forward by NPNS, as well as failure to provide evidence of mitigation measures and their effectiveness,

[1] *Environment Act*, S.N.S. 1994-1995, c. 1, and Part IV.
[2] Jean Laroche, "Northern Pulp's plans for pipeline, effluent treatment plant now public," CBC, February 7, 2019 [Appendix H-9].

the Minister must order a full environmental assessment report pursuant to section 34(1)(c)[3]. This is the only means by which the Minister or a Panel can comprehensively and objectively assess project impacts and permit full and informed public participation in this process, given the potential for harm posed by this project.

2. Introduction

a) Friends of the Northumberland Strait

9. The Friends of the Northumberland Strait (FONS) are community members from Pictou and surrounding area with a deep connection to Pictou County and the Northumberland Strait. Some have lived in Pictou County for their whole lives, and their families have lived here for generations. Others are drawn here to live or summer in the Strait area. They are business people, professionals and fishing families united by their love for this area and for the beautiful and sensitive ecosystem of the Northumberland Strait.

10. FONS began in 2017, and was formally incorporated as a society in 2018. Its members came together as it became clear that NPNS planned to solve its need for a new effluent treatment facility by discharging its treated effluent directly into the Northumberland Strait. Since the *Boat Harbour Act* prohibits NPNS from using Boat Harbour past January 31, 2020, it was easiest, and cheapest, for NPNS to get rid of its pulp mill effluent by treating it on-site, then piping it off its property and discharging it into the Northumberland Strait. FONS members were appalled by the prospect of up to 85,000,000 litres of hot treated effluent containing harmful chemicals, being pumped directly and continuously into the Strait every day. They are very concerned about the potential for serious and irreversible damage to Pictou County's air, soil, freshwater, wetlands and wildlife, and to the Strait ecosystem and the local economy it supports, including fisheries and tourism.

11. Since its formation, FONS has made substantial efforts to promote public awareness of these issues and provide opportunities to debate them, and to empower the public to communicate their concerns. FONS has hosted and supported public meetings, public rallies, media releases and briefings, and has operated a website and a dedicated Facebook page, in an attempt to

[3] *Environment Act*, S.N.S. 1994-1995, c. 1, s. 34(1)(c).

increase understanding of the project, and to better understand the community's concerns. FONS has also made presentations to local municipal councils, various political parties, community groups, and the Prince Edward Island Legislature's Standing Committee on Agriculture and Fisheries.

12. FONS' concerns will be set out in detail below. In summary, FONS submits that:

(i) The registration materials filed by NPNS are incomplete and do not comply with the requirements of section 9(1A) of the *Environmental Assessment Regulations*. The Project is therefore improperly registered and the current EA process is a nullity.

(ii) The ongoing EA process is inadequate and unfair, as it does not allow the public to assess the large amount of scientific documentation and conduct a comprehensive review of the information contained in NPNS's EA submission. NPNS failed to hold promised public information sessions, and held back from the public the majority of the scientific studies until registration;

(iii) The EA submission, although lengthy, lacks critical information, or sufficient detail, in crucial areas such as:

(a) The composition of the effluent to be discharged into the Northumberland Strait;
(b) Studies showing actual composition of raw effluent produced at the NPNS facility;
(c) Studies showing the nature and frequency of process interruptions and disruptions, leaks and spills at the NPNS facility and the impacts of same on effluent composition;
(d) Studies showing that the proposed ETF, which is not yet constructed, can and will in fact reliably and consistently discharge effluent which will meet any particular parameter, or whether it will meet the parameters which form the basis of the discussion in the EA submission;
(e) Studies and analyses regarding mercury issues associated with the project, including methylmercury, mercury and other metals in effluent, and mercury contamination of the NPNS/Canso site;
(f) Baseline data specific to either Caribou Harbour or Caribou Channel;
(g) Professional ecosystem studies in relation to the marine and terrestrial environments;
(h) Thorough and accurate modelling to determine mixing capabilities in Caribou Channel and how the effluent will fare as it circulates in the Strait;
(i) Analysis or engineering study of the impacts of ice scour on buried HDPE pipe or diffusers;
(j) Drawings or mapping/chart coordinates showing the precise pipeline route on the shore, in Caribou Harbour, and in Caribou Channel;
(k) Air emissions data from current operations from all stacks and vents; and
(l) Clear, effective and comprehensive mitigation plans, with substance and that take into account actual conditions in the local environment.

The above defects, individually and collectively, show that the NPNS EA is incomplete, based on inaccurate information and unproven assumptions, and is not supported by credible scientific studies in relevant disciplines.

(iv) Once the above defects are noted, the self-serving summary table in NPNS's Executive Summary, which provides a uniform assessment of the project as having no "significant residual environmental effects" clearly strains credibility. The conclusion fails to take proper account of the nature of pulp mill effluent, the gaps in the information presented by NPNS, and the sensitive environments into which it may be discharged. It is demonstrable proof of a failure to provide a balanced and objective submission of environmental impacts for the Minister's review.

b) Reasonable Apprehension of Bias

13. On February 12, 2019, on behalf of FONS, we submitted a package both to the Minister and to the Environmental Assessment Branch, at the address given for submission of public comments on this EA. That submission asked the Minister to recuse herself from the NPNS ETF EA process due to a significant conflict of interest. On March 6, 2019 we received a letter dated March 5, 2019 from the Minister, advising that the Minister would not be recusing herself from this EA process. We maintain the position, set out in our letter of February 12, 2019, that the Minister's involvement in the EA process gives rise to a reasonable apprehension of bias. As a result, the Minister must recuse herself in order to maintain public confidence and to ensure the integrity of the process.

c) Context of NPNS ETF EA

(i) Boat Harbour and past effluent discharges

14. A central premise of the NPNS' submission, and its public statements about the impacts of its operations on the Northumberland Strait, is the following:

> Since effluent has been discharging into the Strait for the past 50 years, it will cause no change to the ecosystem by discharging effluent in a new location.[4]

[4] Email string Nov. 15-17, 2017, NP response to media questions, (Appendix H-8).

15. The environmental cost of discharging effluent into a living ecosystem has, to date, been borne largely by the Boat Harbour Basin and by the residents of Pictou Landing First Nation. The environmental damage to Boat Harbour from continuous effluent discharge is an environmental disaster, which cannot be truly quantified in monetary terms.[5] However, using Boat Harbour as the effluent dump for 50 years has resulted in an estimated clean-up cost of over $200 Million. Fortunately, the abuse of Boat Harbour is scheduled to end on January 31, 2020.

16. Now, the proposed plan will dump effluent into the marine environment at outfall location CH-B in the Caribou Channel, just outside Caribou Harbour.

17. KSH Solutions Inc., pulp and paper engineering consultants advising NPNS, have touted the benefits of Boat Harbour Basin in reducing the harmfulness of NPNS effluent currently discharged at Point C.[6] In a KSH power point obtained via the *Freedom of Information and Protection of Privacy Act*, KSH describes Boat Harbour Basin as "[a] large, natural final polishing/stabilization basin [which] follows prior to release to the Northumberland Straight [sic]."[7] This "final polishing/stabilization basin" provides a "settling effect…prior to Point D, so the impact on marine environments is even less pronounced."[8] The slow flushing time in Boat Harbour Basin allows for settling of solids, cooling of effluent, and performs other useful filtering functions. By the time the effluent enters the Strait, it has already dumped a lot of its toxic cargo in Boat Harbour Basin. Nova Scotia taxpayers will be paying over $200 Million to clean that up.

18. The contribution of Boat Harbour Basin in the effluent discharge process is also acknowledged by NPNS officials. The Mill's Technical Manager said in an email dated November 29, 2017:

[5] Boat Harbour Remediation Project Handout, (Appendix H-11).
[6] Point C is the point at which effluent leaves the current treatment facility and enters Boat Harbour Basin. After it cools and polishes, it flows out of the Basin at Point D. The locations of Points C and D are shown on the aerial photo at p. 10, Figure 2.1-1 NPNS EA Submission.
[7] KSH Power point, excerpt (Appendix H-4).
[8] KSH Power point, excerpt (Appendix H-4).

> Some say effluent quality [with new ETF] will be worse than today because of all the polishing that is happening across the [Boat Harbour] basin – and they are correct to some extent.[9]

19. In the same email, the Technical Manager goes on to say:

> Effluent temperature [of new ETF] – hotter than now [Boat Harbour] big basin provides a lot of natural cooling today[10]

20. As acknowledged by engineering consultants and by NPNS, Boat Harbour has taken the brunt of the effluent discharge to date and there will be no comparable "buffer zone" effect on the effluent when discharged at CH-B. The only thing standing between the raw effluent from the mill and the fish spawning grounds, active fishing grounds, and marine ecosystem, is the proposed ETF, which remains largely a mystery, both in terms of what it is capable of doing, and what it will actually be used for by NPNS.

21. The NPNS EA does not answer the question of what will happen to the substances currently settling out in Boat Harbour. The EA does not provide objective scientific evidence as to the likelihood that the proposed ETF will, or can, actually change the effluent into a harmless and benign substance, or that it will meet any standard or will in fact be "better quality" than what is currently discharged into in Boat Harbour. The Minister is given only assumptions as to water quality characteristics, with no proof that these are realistically achievable or that NPNS actually intends to achieve them. The NPNS proposal is based on the premise that the effluent discharge into the Strait should simply be allowed to proceed, and that monitoring will be conducted to verify its safety at some vague point in the future. In perhaps two years after effluent discharge begins, someone will assess whether it has caused any problems. This approach is a recipe for environmental harm, and runs contrary to an underlying principle of the *Environment Act*, which requires that:

> the precautionary principle will be used in decision making so that where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation…[11]

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[9] Email dated Nov. 29, 2017 from NPNS Technical Manager to NS TIR, p. 4 of 5 (Appendix H-10).
[10] Email dated Nov. 29, 2017 from NPNS Technical Manager to NS TIR, p. 4 of 5 (Appendix H-10).
[11] *Environment Act, supra*, ss2(a), b(ii); *Sorflaten v Nova Scotia (Minister of Environment),* 2018 NSSC 55 at para 38.

22. As discussed below, no testing or test results have been provided to show the effluent's composition. Most of the substances contained in raw effluent are not discussed, and their impacts on the marine, freshwater, terrestrial and atmospheric environments are not analysed. Likewise, as will be discussed further below, the Stantec modelling used to predict the effluent mixing and transport in the marine environment has fundamental flaws, and must be disregarded.

(ii) EA enforcement and compliance issues

23. In 2017, Nova Scotia's Auditor General issued a report in relation to environmental assessments conducted under the *Environment Act*.[12] From 2013 to 2016, of the 54 environmental assessments conducted, 53 were approved, amounting to an approval rate of over 98%.[13] This figure is of great concern, as it suggests that the environmental assessment process in Nova Scotia is a process by which projects receive a rubber stamp rather than a thorough and objective environmental review.

24. The Auditor General went on to conclude that, where environmental assessments are approved on conditions, it is likely that Nova Scotia Environment (NSE) does not monitor compliance or verify that the required conditions have been satisfied. Within a sample of 53 EA conditions examined by the Auditor General, 23 were not verified or monitored for compliance. As the Auditor General says:

> "Without monitoring, Nova Scotia Environment does not know if the terms and conditions of approved projects are effective in reducing impacts on the environment."[14]

25. Where there is a failure to monitor compliance with EA approval conditions, a failure to enforce conditions, or a failure to monitor whether an approved project is actually causing environmental harm, the risks of harm from such projects increases dramatically.

[12] Report of the Auditor General, November 2017, Chapter 4 Environmental Assessments, pp. 43-53 (Appendix H-12)
[13] Report of the Auditor General, para. 4.2, p. 45 (Appendix H-12)
[14] Report of the Auditor General, para. 4.5, p. 46 (Appendix H-12)

(iii) The Province's agreements with NPNS cannot fetter the Minister's discretion in making a decision on the EA

26. As set out in our February 12, 2019 submission, NPNS has stated publicly that its various contracts with the Province should be determinative of the results of administrative approval processes. In its 2015 appeal of the Industrial Approval issued by the Province, NPNS stated that "[g]overnment cannot arbitrarily revoke Northern Pulp's contractual rights under the Agreements with the Province by way of an administrative approval process."[15] Acceding to such an argument would constitute an unlawful fettering of the Minister's discretion in this matter. The Minister must consider contractual arrangements with NPNS to be an irrelevant consideration in this process, and make her decision under section 34(1) of the *Environment Act* without regard to such agreements.

(iv) The Minister must consider all possible outcomes under section 34(1) of the *Environment Act*, including rejection of the project

27. The Minister must consider all possible outcomes under section 34(1) of the *Environment Act*, including whether to reject the project outright.[16] Correspondence between NPNS and the NSE demonstrates a predisposition to approve the project, and shows that rejection of the proposal is not being considered by provincial officials.

28. For instance, by email dated November 14, 2017, NPNS wrote to the Deputy Minister of NSE requesting it be granted "regulatory certainty" by engaging in negotiations on a future IA [Industrial Approval] prior to the EA.[17] By letter of November 30, 2017, 14 months before the EA application was even submitted, NSE's Eastern Regional Director agreed to begin negotiations as to the terms of the Industrial Approval that would follow the EA.[18] The correspondence further shows that both parties appear to assume that the purpose of the EA is

[15] Letter from Ms. Terri Fraser, Technical Manager Northern Pulp Nova Scotia Corporation, to the Honourable Randy Delorey, Minister of Environment, 9 April 2015 (Appendix H-21).
[16] *Environment Act*, S.N.S. 1994-1995, c. 1, s. 34(1)(c).
[17] Email from Bruce Chapman to Deputy Minister Frances Martin, November 14, 2017 (redacted as provided by FOIPOP) (Appendix H-23)
[18] Letter to Bruce Chapman, Northern Pulp, from Paul Keats, Eastern Regional Director NSE, dated 30 November 2017 (Appendix H-20)

to establish effluent discharge levels[19], and not to determine whether the project will cause adverse effects or significant environmental effects that cannot be mitigated. The NSE letter agrees to negotiate those Industrial Approval items that "are not impacted by the future environmental assessment process".[20] The NSE official fails to recognize that all items in an Industrial Approval would potentially be impacted by the EA, since all terms are contingent upon EA approval, and all terms would be unnecessary should the ETF project be rejected.

29. If rejection of the project were actually under consideration by NSE, this would have been reflected in the correspondence. Taking a closed-minded approach is contrary to the Minister's duty in coming to a decision in this matter.

3. The environmental assessment scheme: the *Environment Act* and the *Environmental Assessment Regulations*

30. The current review of NPNS's proposed ETF is proceeding as a Class 1 environmental assessment. The review and decision-making process is governed by the *Environment Act* and the *Environmental Assessment Regulations* ["*EA Regs*"].

31. NPNS's proposed ETF was registered for EA on February 7, 2019. As per s 34(1) of the *Environment Act* and s 13(1) of the *EA Regs,* the Minister has 50 days from the registration date to determine whether:

(1) additional information is required;
(2) a focus report is required;
(3) an environmental-assessment report is required;
(4) all or part of the undertaking will be referred to alternate dispute resolution;
(5) a focus report or an environmental-assessment report is not required, and the undertaking may proceed; or
(6) the undertaking is rejected because of the likelihood that it will cause adverse effects or significant environmental effects that cannot be mitigated.[21]

[19] NSE letter to Bruce Chapman of 30 Nov 2017, *supra*, at page 1: "The upcoming environmental assessment will also be used to establish those [effluent discharge concentration] limits." (Appendix H-20)
[20] NSE letter to Bruce Chapman of 30 Nov 2017, *supra*, at page 2. (Appendix H-20)
[21] *Environment Act,* SNS 1994-95, c 1 at s 34(1).

32. The *EA Regs* provide additional details on the parameters of the Minister's decision. Section 13(1) of the *Regs* specifies the circumstances in which the Minister may select each of the options listed in s 34(1) of the *Environment Act* as follows:

> 13(1) No later than 50 days following the date of registration, the Minister shall advise the proponent in writing of the decision under subsection 34(2) of the Act
>
> (a) that the registration is insufficient to allow the Minister to make a decision and additional information is required;
> (b) that a review of the information indicates that there are no adverse effects or significant environmental effects which may be caused by the undertaking or that such effects are mitigable and the undertaking is approved subject to specified terms and conditions and any other approvals required by statute or regulation;
> (c) that a review of the information indicates that the adverse effects or significant environmental effects which may be caused by the undertaking are limited and that a focus report is required;
> (d) that a review of the information indicates that there may be adverse effects or significant environmental effects caused by the undertaking and an environmental-assessment report is required; or
> (e) that a review of the information indicates that there is a likelihood that the undertaking will cause adverse effects or significant environmental effects which are unacceptable and the undertaking is rejected.[22]

33. As per s 13(1)(b), the Minister can only approve an undertaking under s 34(1) of the *Environment Act* if she concludes that it *would not cause any* adverse effects or significant environmental effects, or that any such effects would be mitigable.

34. In order for an adverse effect or a significant environmental effect to be adequately mitigated for the purposes of s 13(1)(b) of the *EA Regs,* the effect in question must be mitigable to the point that its impact is less than "limited". This is based on the combined effect of subsections 13(1)(b) and (c) – as per subsection 13(1)(c), if the undertaking may cause even "limited" adverse effects or significant environmental effects, the Minister must order a focus report.

35. As a result, the Minister is only authorized to approve NPNS's proposed ETF under s 34(1) of the *Environment Act* if she is certain that there will be no adverse effects or significant environmental effects, or that such effects can be mitigated to the extent that they all but

[22] *Environmental Assessment Regulations,* NS Reg 26/95 ["*EA Regs*"].

disappear. This is consistent with the purposes of the *Environment Act,* including upholding the precautionary principle and maintaining environmental protection.[23]

36. NPNS employs various definitions of what it terms a "significant adverse residual environmental effect" when evaluating the proposed ETF's potential impact on "Valued Environmental Components" ("VECs"). These definitions do not appear anywhere in the *Environment Act* or the *EA Regs,* and the Minister should exercise due caution in relying on them when determining whether the proposed ETF will cause significant environmental effects. NPNS does not propose a definition of "adverse effect" or any similar term when evaluating the project's potential impacts on human health.

37. As will be outlined in detail in the following sections, NPNS's EA registration materials are far from sufficient to allow the Minister to approve the proposed ETF. The Minister cannot, and should not, rely on NPNS's "vague assurances" of mitigation and further studies to approve a project that could have widespread and devastating impacts on the Province's environment, economy, and rural communities.[24]

4. Procedural Issues

38. It is trite to state that, as a general rule, there is "[…] a duty of procedural fairness lying on every public authority making an administrative decision which is not of a legislative nature and which affects the rights, privileges or interests of an individual."[25]

39. The current EA process has been marred by numerous procedural defects, which have resulted in a violation of the duty of procedural fairness. These procedural defects have undermined the public's ability to fully engage in the EA, contrary to the *Environment Act*'s explicit goal of "providing access to information and facilitating effective public participation in the formulation of decisions affecting the environment […]".[26]

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[23] *Environment Act, supra*, ss2(a), b(ii); *Sorflaten v Nova Scotia (Minister of Environment),* 2018 NSSC 55 at para 38.
[24] *Taseko Mines Ltd v Canada (Minister of the Environment),* 2017 FC 1099 at paras 123-124.
[25] *Cardinal v Kent Institution,* [1985] 2 SCR 643 at 653.
[26] *Environment Act, supra*, ss2(h).

40. The procedural flaws impacting the ongoing EA are examined in detail in the following sections.

a) Barriers to public participation

41. NPNS has submitted a 614-page Registration Document to the Province, along with 18 Appendices. In total, there are almost 1,700 pages of materials for the public to review. Many of the documents included with NPNS's materials contain dense scientific and technical information which can be time consuming for a layperson to digest.

42. The ongoing Class 1 EA process provides only 30 days for the public to review and comment on NPNS's materials. This is far from an adequate comment period. Minister Miller herself has acknowledged that this process is defective, stating "I don't know that the public is really going to be able to fully digest everything that's been submitted."[27]

43. The impacts of this inadequate comment period on the public's ability to review and understand the EA materials are further aggravated by NPNS's failure to engage with the public in a thorough and transparent manner prior to registering its project for EA.

44. Both the *EA Regs* and NSE policy documents explicitly contemplate a proponent's responsibility to engage with members of the public who may be impacted by a proposed project, and to attempt to understand and address their concerns. For instance, when formulating a decision under s 34(1) of the *Environment Act,* the Minister must consider "[…] concerns expressed by the public and aboriginal people about the adverse effects or the environmental effects of the proposed undertaking."[28] Furthermore, in its "Citizen's Guide to Environmental Assessment," NSE declares that "[p]ublic participation is vital to the success of environmental assessment."[29]

45. NPNS and/or its representatives made numerous promises with respect to public engagement prior to registering its EA materials, many (if not most) of which went unfulfilled. NPNS held

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[27] Jean Laroche, "Northern Pulp's plans for pipeline, effluent treatment plant now public," CBC, February 7, 2019 [Appendix H-9].
[28] *EA Regs, supra,* at s 12(c).
[29] Nova Scotia Environment, *A Citizen's Guide to Environmental Assessment* (Halifax, NS: Nova Scotia Environment, 2017) at p 4. Link to: https://novascotia.ca/nse/ea/docs/EA.Guide-Citizens.pdf

two public "Open House" sessions, one in December 2017 and the other in January 2018.[30] Following the January 2018 Open House, Dillon Consulting (a consulting firm retained by NPNS to conduct the EA) committed in writing to conducting another series of Open House sessions in the spring of 2018.[31] Similarly, in July 2018 Dillon Consulting committed to holding another Open House session in the fall of 2018.[32] To the best of FONS' knowledge, neither of these commitments were upheld. As a result, the most recent public engagement session conducted by NPNS was over a full year before its EA materials were registered with the Province.

46. This failure to uphold explicit commitments made to members of the public is all the more egregious in light of the significant changes made to the ETF project beginning in October 2018. In July, 2018, NPNS announced that the pipeline route it had originally contemplated was not feasible. The planned route and outfall were therefore altered dramatically. We have been informed that Bruce Chapman, General Manager of the NPNS mill, made a verbal commitment to Krista Fulton of FONS on August 31, 2018 in a phone call at 11:34 a.m. that additional Open House sessions would be held regarding the new pipe route and outfall location. Mr. Chapman advised Ms. Fulton that: "Yes, we will have another Open House because that is what we promised."[33] However, despite this promise and NPNS's previous commitments, there were no public meetings held between the time the new route was selected and the date on which the EA materials were submitted to the Province.[34] A public information session has therefore never been held with respect to the new Caribou route and the CH-B outfall.

47. In addition, NPNS and/or its representatives committed on numerous occasions to releasing specialist studies completed as part of the EA to the public upon their completion.[35] These

[30] NPNS website Project Materials page, accessed January 31, 2019 (Appendix H-25).
[31] Letter from Annamarie Burgess to Jill Scanlan, dated January 22, 2018 (Appendix H-24)
[32] Letter from Annamarie Burgess to Jill Scanlan, dated July 9, 2018 (Appendix H-25).
[33] Personal conversation between Bruce Chapman and Krista Fulton, August 31, 2018.
[34] Brendan Ahern, "Lack of public consultation ahead of Northern Pulp's submission of Environmental assessment sparks backlash," The News, January 16, 2019 [Appendix H-6].
[35] Letters from Annamarie Burgess to Jill Scanlan, appendices H-24 and H-25; Northern Pulp, "Replacement Effluent Treatment Facility" webpage, accessed January 10, 2019 [Appendix H-28].

studies were to be made available on the ETF project website.[36] However, as of the date of its EA registration NPNS had only made a small portion of its specialist studies available to the public. Specifically, of the 18 Appendices included with its EA materials, NPNS only made two full appendices and three partial appendices available on its website prior to registration.[37]

48. NPNS's failure to make the vast majority of its specialist studies available to the public prior to the EA registration would be understandable if the studies in question had not been completed until the registration date (February 7, 2019). However, this is far from the case. The chart below lists all of the studies included in NPNS's EA materials and the dates on which they were completed.

Appendix	**Title of study**	**Date**	**Posted on NPNS project website?**
A	Joint Stock Record	November 8, 2018	**No**
B	NPNS Market Profile	January 26, 2018	Yes
C	Technology Selection Report	July 1, 2017	Yes
D	Veolia AnoxKaldnes Reference List	January 1, 2018	**No**
E	E1 – Stantec Final Caribou Discharge Receiving Water Study	December 19, 2018	Yes – this addendum was finalized on December 19, 2018, but not posted until mid-January 2019
	E2 – Stantec Response to Questions	January 5, 2018	Yes
	E3 – Stantec Preliminary Receiving Water Study Effluent Treatment Plant Replacement	August 11, 2018	Yes
F	Description of Marine Pipeline Construction	January 25, 2019	**No**

[36] The website address, at the time, was www.northernpulpeffluenttreatmentfacility.ca – This website still exists but you are redirected to another address.
[37] Northern Pulp, "Project Materials" webpage, accessed January 31, 2019 [Appendix H-26].

Appendix	Title of study	Date	Posted on NPNS project website?
G	Proposed EEM Program	January 2019 (date not specified)	**No**
H	Proposed Follow Up and Monitoring Program	January 2019 (date not specified)	**No**
I	I1 – Public Engagement Materials	December 2017; January 2018 (dates not specified)	Yes
	I2 – What We've Heard Summary Report	March 2018 (date not specified)	Yes
	I3 – Record of Project Website	January 16, 2019	**No**
	I4 – Stakeholder Meeting Minutes	December 21, 2017; February 8, 2018; February 20, 2018; October 22, 2018	**No**
J	J1 – 2016 EEM with Appendices	March 2016 (date not specified)	Yes
	J2 – What is Environmental Effects Monitoring	Undated	**No**
K	K1 – Stantec Air Dispersion Modeling Study of Replacement Effluent Treatment Facility	January 21, 2019	**No**
	K2 – Stantec Memo re Hoffman Report	June 15, 2018	**No**
L	L1 – Summary of Baseline Noise Monitoring	Undated	**No**
	L2 – Baseline Noise Monitoring Results for R1 – Maritime Oddfellows Home	December 18, 2017	**No**
	L3 – Baseline Noise Monitoring Results for R2 – 12 Birch Lane	December 17, 2017	**No**
	L4 – Baseline Noise Monitoring Results for R3 – 1220 Loch Broom Loop	December 18, 2017	**No**

Appendix	Title of study	Date	Posted on NPNS project website?
	L5 – Baseline Noise Monitoring Results for R4 – 108 Grant Abercrombie Branch Road	December 17, 2017	**No**
	L6 – Temperatures During Noise Monitoring Event	December 17, 2017	**No**
M	M1 – Watercourse Fish and Habitat Field Data Sheets	June 12, 2018	**No**
	M2 – Watercourses in the Vicinity of the Project Footprint Area Photo Plate	December 3, 2018	**No**
	M3 – Summary of General Physical Characteristics of Predicted Watercourse Crossings	December 3, 2018	**No**
	M4 – Maxxam Laboratory Certificates	December 17, 2018	**No**
	M5 – Middle River of Pictou Water Availability – Final Report	December 17, 2015	Yes
N	N1 – Potential Priority Animal Species	November 15, 2018	**No**
	N2 – Potential Priority Plant Species	November 15, 2018	**No**
O	O1 – Wetland Delineation Data Forms	June 12, 2018	**No**
	O2 – WESP_AC Functional Assessment Result Scores	Undated	**No**
P	Plant Data	Undated	**No**
Q	Q1 – Avian Survey Locations	June 30, 2018	**No**

Appendix	Title of study	Date	Posted on NPNS project website?
	Q2 – Map of MBBA Square 20NR25	April 13, 2006	**No**
	Q3 – MBBA Data Summary for Square 20NR25	November 22, 2018	**No**
	Q4 – Map of MBBA Square 20NR26	April 13, 2006	**No**
	Q5 – MBBA Data Summary for Square 20NR26	November 22, 2018	**No**
	Q6 – Results of all Avian Survey Efforts	June 20, 2018	**No**
R	Scientific Literature BKME Effects on Lobster	August 27, 2018 (amended January 25, 2019)	**No**

49. Most, if not all, of the listed studies could easily have been posted on the ETF project website prior to the project's registration for EA on February 7, 2019. Indeed, most of the studies were completed months before the registration date. It is unclear why NPNS chose not to post these studies on its website for public review upon their completion, as per its previous commitment. NPNS's failure to do so has unquestionably undermined the public's ability to review, understand, and provide thoughtful and fulsome comments on the EA materials.

50. In FONS's respectful submission, these clear procedural defects have resulted in violations of the duty of procedural fairness. Furthermore, as per subsection 12(d) of the *EA Regs,* when formulating a decision under subsection 34(1) of the *Environment Act,* the Minister is required to take into account "steps taken by the proponent to address environmental concerns expressed by the public and aboriginal people." NPNS's failure to uphold even its most basic commitments to engage the public illustrates that it has not listened to the public's concerns, let alone taken steps to address them. In light of this fundamental procedural flaw, the Minister cannot approve the proposed ETF.

b) Incomplete Registration Document

51. Subsection 9(1A)(b) of the *EA Regs* require that an EA registration document must include certain basic information. As detailed below, NPNS's Registration Document does not fulfill the requirements of subsections 9(1A)(b)(ix), (x) or (xii).

(i) Section 9(1A)(b)(ix): A description of the proposed undertaking

> NPNS describes the proposed ETF at Section 5.0 of its Registration Document. However, its project description fails entirely to address at least one significant component.
>
> KSH Consulting's *Technology Selection Summary,* at Appendix C to NPNS's Registration Document, speaks to the inclusion of an oxygen delignification system as part of the new ETF. However, there is no mention of oxygen delignification anywhere in the Registration Document. Furthermore, NPNS has previously stated that oxygen delignification would not be installed as part of the new ETF, but would be an "anticipated future upgrade" that would occur sometime after the new ETF became operational.[38]
>
> If an oxygen delignification system will be included as part of the new ETF, then NPNS must address this component as part of its project description as per subsection 9(1A)(b)(ix) of the *EA Regs.* If not, then NPNS must clarify that the KSH *Technology Selection Summary* does not accurately reflect the components of the proposed ETF.

(ii) Section 9(1A)(b)(x) Environmental Baseline Information

> NPNS's materials contain no environmental baseline information specific to the receiving environment, i.e.: Caribou Harbour and Caribou Channel.[39] And, as listed below in section 8, a large number of other baseline studies are noted as necessary but have not been completed. This baseline information is fundamental for an understanding of the receiving environments and for meaningful environmental effects monitoring.[40] NPNS has failed to satisfy this requirement.

[38] Dillon Consulting, *Northern Pulp Nova Scotia – Replacement Effluent Treatment Facility – Information Submission to CEAA*, April 2018, excerpt [Appendix H-22].
[39] This is acknowledged in the NPNS EA submission at **Section 8.11.2, p 337**
[40] MacKay, A.A., *Northern Pulp's Effluent Disposal Plans – Issues and Answers*, February 2019 (MacKay commentary)(Appendix C-1), regarding the necessity of conducting species and chemical composition baseline surveys.

(iii) Section 9(1A)(b)(xii): All sources of any public funding for the proposed undertaking

> NPNS purports to fulfill this requirement at page 1 of its Registration Document, where it states as follows: "[a]t the date of Registration, the Province of Nova Scotia has made contributions to the cost planning and design of the project."
>
> This meagre description clearly does not identify all sources of any public funding for NPNS's proposed ETF. NPNS fails to even specify which provincial Departments provided the funds to which it refers. This cannot, and does not, fulfill the requirements of subsection 9(1A)(b)(xii).

52. In light of the above, the ETF project should not have been registered for EA. In the alternative, these omissions demonstrate that the Minister does not have sufficient information to approve the proposed ETF.

5. Closed Loop is a Viable Alternative to the ETF

53. At section 4.1 of its EA materials, NPNS briefly discusses alternatives to the project. FONS is of the view that a closed-loop system remains a viable choice compared to the proposed ETF, from an economic and environmental perspective.

54. A closed-loop effluent system is the only environmentally viable solution in this situation. A closed loop system would not discharge effluent into the environment and would allow the Mill to continue to produce pulp for the market.

55. NPNS retained Brian McClay and Associates to prepare a Global Market Profile[41] to look at whether NPNS could change from its current Northern Bleached Softwood Kraft production ("NBSK"), which produces effluent discharges into the environment, to a closed loop system. NPNS says that the Market Profile concludes that changing its production process to a closed loop system would mean that the mill would not "remain competitive", and that "NPNS must continue to operate by producing NBSK to be economically viable."[42]

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[41] Brian McClay and Associates, Global Market Profiles: NBSK, UKP & BCTMP, NPNS EA Submission, at Appendix B (the "Market Profile"). The terms of the retainer are not disclosed, and there is no indication of what information came directly from NPNS and the degree of independent analysis performed by Brian McClay and Associates.

[42] NPNS EA Submission, Registration Document, section 4.1, p. 26.

56. In fact, the Market Profile does not reach such conclusions, and states only that the current process is "the most competitively viable option by far".[43] Presumably, this means that the current process yields the highest profits.

57. The Market Profile does not say that changing production to a closed loop system would be unprofitable for NPNS. Rather, the Market Profile says simply that NPNS would have to compete in new markets and, in the case of Bleached Chemi-Thermo-Mechanical Pulp production, would require new equipment and would need to address electricity demand issues.[44] Whether this would be a real obstacle remains to be seen, but the Market Profile does not mention that, at present, NPNS produces its own power to satisfy 90% of its current electricity requirements[45] and that it is "almost self-sufficient in energy."[46] NPNS does not wish to make such an investment to modernize its operations and eliminate its effluent discharges. NPNS wants to characterize the solution as a stark choice between NPNS continuing to make its current profits and offloading the environmental problems to the Northumberland Strait, or closing the Mill entirely. This is a false choice and an oversimplification of the market and the choices facing NPNS. The Market Profile demonstrates that other options exist which are more environmentally acceptable and may also be economically viable.

58. It is also noted that the Market Profile provides no assessment of the economic costs to the taxpayers in relation to construction of the proposed ETF, or the economic cost to the community, or the environment, of current operations and the ETF. The Market Profile limits its scope solely and unquestioningly to NPNS profit margins and ignores the question of the economic/environmental burden externalized by NPNS operations.

59. Other potential alternatives or treatments, including evaporation, were never examined in any meaningful way. Discharge of effluent into the Strait was the only alternative given any serious consideration.

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[43] Market Profile, at page 2 "summary".
[44] Market Profile, at page 9.
[45] NPNS webpage, NPNS Operations Today, "Facts", at http://www.paperexcellence.com/npns-operations-today , accessed 28 Feb. 2019.
[46] NPNS webpage, NPNS Environment, at http://www.paperexcellence.com/npns-environment , accessed 28 Feb. 2019.

60. The arguments against a closed-loop system are not compelling, and can be answered via a change in product line. Given the environmental risks posed by this project, a closed-loop system is the best choice for the environment, the mill and the region.

6. Effluent composition

61. Possibly the most significant gap in the materials filed by NPNS and its consultants, is the complete lack of objective scientific reporting and test results regarding the composition of the effluent that is to be discharged from the proposed ETF into the herring spawning grounds and Caribou Channel. The Minister must have reliable and precise information about the actual effluent that will be entering the environment, in order to assess the impacts it will have on the environment. Without this information, an assessment of environmental impacts cannot proceed as it is impossible and absurd to assess the impacts of an unknown substance.

62. The only information about the characteristics and composition of the effluent that will flow out of the proposed ETF is described as "expected water quality characteristics". It appears in tables set out in the Receiving Water Studies.[47] As well, no explanation is provided as to why the data in these tables differs from one table to another: the expected water quality value for Total Nitrogen (TN) is listed as 3.0 mg/L in the August 2017 Preliminary Study, but 6.0 mg/L in the December 2018 Addendum.

63. In a letter dated October 5, 2017, an NSE official wrote to the NPNS General Manager, agreeing that NPNS could use the water quality characteristic numbers (as reproduced in Table 3-2 of the August 2017 Receiving Water Study) for "the design of the project" but that this agreement did "not encumber the Minister's decision following the EA process". The official went on to say:

> NSE is aware that current data from the facility indicates possible exceedances at point C for many of the parameters. **As part of the EA, Northern Pulp must demonstrate that the new treatment facility can achieve the numbers highlighted… above**. If any of the parameters, including maximum flow, require modifications to the mill itself to achieve the volumes and concentrations modelled in the study, Northern Pulp must also

[47] Stantec, Preliminary Receiving Water Study, August 17, 2017, p. 3.54 Table 3-2, NPNS EA Submission, Appendix E3; and Stantec, Addendum Receiving Water Study, December 19, 2019, p. 17, Table 3.2, NPNS EA Submission, Appendix E1.

> submit a plan to the Department indicating what changes are required to the Mill to achieve the maximum concentrations. [emphasis added][48]

64. The NPNS materials contain no assessment or studies done to demonstrate that the new treatment facility can achieve the assumed water quality characteristics. The Minister is asked to approve a project to construct a facility without being shown that it will work.

65. The Receiving Water Studies say that the expected water quality characteristics of the treated effluent were provided by KSH.[49] There are references to a KSH "brief" and report, and other KSH communications throughout the submission.[50] However, no report from KSH on the predicted effluent is provided. The only KSH-authored document is found at Appendix C, which is a Technology Selection Report. That report contains no information about the parameters of the effluent that will flow out of the diffusers into the marine environment, or that could leak out of breaks or ruptures in the pipe or at the ETF facility itself. There is an oblique reference to testing conducted in Sweden, but no results or report is provided.[51] NPNS has chosen not to provide any hard evidence that the effluent will achieve the parameters set out in its submission to the Minister, relying instead on hypothetical assumed parameters. This is a fundamental problem with the EA and is grounds for rejection of the entire submission.

66. NPNS's registration document expressly concedes that the information on which they rely is speculative and the assumptions untested.

> Due to uncertainty regarding effluent composition and approximate concentrations of substances present in the future treated effluent (which will not be verified until the project is operational), the identified candidate COPCs [chemicals of particular concern] in effluent are considered preliminary at this time.[52]

67. The EA registration demonstrates just how vague and speculative the information about the composition/characteristics of the effluent is, in the following statement:

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[48] Letter to General Manager, NPNS, from Supervisor of Environmental Assessment, NSE, dated October 5, 2017, p. 2 (Appendix H-15).
[49] Stantec, Preliminary Receiving Water Study, August 17, 2017, p. 3.54 Table 3-2, NPNS EA Submission, Appendix E3; and Stantec, Addendum Receiving Water Study, December 19, 2019, p. 17, Table 3.2, NPNS EA Submission, Appendix E1.
[50] NPNS EA Submission, Appendix E3, Stantec, Preliminary Receiving Water Study, August 17, 2017, section 2.1.3, p. 2.22 and "References" at p. 6.92; NPNS EA Submission, Section 9.2.4.2, p. 510.
[51] NPNS EA Submission, Section 4.2.1, p. 29. If testing was done, and was successful, one would assume that the results would be provided.
[52] NPNS EA Registration Document, Section 9.2.4.2, p. 506.

> While there are some uncertainties associated with the representativeness of the effluent chemistry characterization presented in Toxikos (2006) to the proposed future NPNS project effluent (as noted above), it is believed that there are sufficient similarities to state that the Toxikos (2006) information can serve as an indication of what may be expected in relation to NPNS project effluent composition/characteristics (KSH Consulting, personal communication).[53]

68. It is unusual to rely on a report from a mill which process different wood products and which discharges effluent into an entirely different ocean on the other side of the world, with different dynamics, temperatures etc., but not to provide a report summarizing and analyzing data from the actual mill that will be producing the effluent. As well, as has been noted elsewhere,[54] the mill being analysed by the Toxikos report was never built[55], so there is no way to compare those predictions with later actual results to determine the degree of accuracy of the predicted outcomes.

69. No attempt is made to explain the lack of data from NPNS or KSH regarding the precise effect of the ETF on the mill's effluent, despite the onus on NPNS to provide a complete set of information so the Minister can make a decision on the environmental impacts of the proposal.

70. The water quality characteristics assume that the components of the mill's effluent output will be more or less constant and stable. However, no evidence is provided for this. No information is provided about how the effluent composition may vary due to system disruptions, black liquor spills, equipment failures or a failure of the proposed ETF itself. Due to the age of this mill, it is possible that it will not be able to maintain a constant and predictable effluent flow and composition, and the chemistry of the effluent may vary considerably from time to time. As per the letter from Nova Scotia Environment of October 5, 2017, exceedances have been recorded at Point C where the effluent discharges into Boat Harbour Basin.[56] The fact that exceedances can occur demonstrates that the effluent flow is not constant or necessarily stable. The Minister should obtain a report regarding the nature and frequency of process

[53] NPNS EA Registration Document, Section 9.2.4.2, p. 507. While this statement is made in relation to a human health analysis, it demonstrates the lack of any certainty as to the actual effluent composition.
[54] Sweeney, E. *Comments on File No 1003, Environmental Assessment of NP's Proposed ETF*, Report, p. 2 Executive Summary (Appendix G-1).
[55] Timberbiz: Gunn's pulp mill permit lapses so land now for sale (Appendix H-14)
[56] Letter to General Manager, NPNS, from Supervisor of Environmental Assessment, NSE, dated October 5, 2017, p. 2 (Appendix H-15).

interruptions, disruptions, leaks and spills at the NPNS facility, and the impacts of such events on effluent composition.

71. The lack of any hard, provable data on the effluent that will come out of the end of the pipe ensures that the NPNS EA remains a hypothetical exercise. It is impossible to assess the impacts of an unknown substance. All the discussions regarding modelling and impacts are theoretical, as the assessment is not based in fact. The absence of scientific studies leads to the conclusion that NPNS is unable to prove the most fundamental component of their EA proposal, which is: "what is the composition of the effluent that NPNS proposes to discharge?" It would be an error for the Minister to accept an EA based on assumed effluent composition, rather than on proof of actual composition. This lack of basic information, despite its obvious centrality to the EA, must invalidate the submission.

7. Other effluent characteristics

72. Pulp mill effluent can contain many other components beyond those listed by NPNS as "expected water quality characteristics". Many of these are described in the context of human health impacts, but there is no discussion as to how they will fare in the receiving environment, whether that be the diffuser into the Caribou Channel, or via a leak or spill.[57]

73. Pulp mill effluent contains, or can contain, many toxic, bio-accumulative and carcinogenic components. Testing of raw effluent[58] from the Mill by the Boat Harbour Remediation Project reveals the presence of many compounds, including cadmium and mercury, which are problematic and bio-accumulative.[59] Mercury is often associated with pulp and paper operations.[60] The impacts of mercury and cadmium are not assessed in any meaningful way in the EA submission, yet they are clearly present in the effluent from the Mill and in the sediments in Boat Harbour Basin.[61] The long-term effects of discharging such substances into

[57] NPNS EA Submission, Section 9.2.4.2, p. 516 refers to a long list of substances, including mercury
[58] This relates to raw untreated effluent, which is different from the effluent which will be discharged after treatment in the proposed new ETF. The test results were provided by Ken Swain of the Boat Harbour Remediation Project in relation to raw effluent testing done in 2017 (Appendix H-1).
[59] Dr. Margaret Sears, *Comments regarding the Northern Pulp Nova Scotia Environmental Assessment Registration Document, Replacement Treatment Facility*, March 8, 2019, pp. 3 and 5, (Appendix F-1);
[60] Dr. Sears Report, at pp. 3 and 5 (Appendix F-1).
[61] Boat Harbour Remediation Project Handout, Appendix H-11.

the marine environment are not addressed in the NPNS submission, despite the potential impacts on the marine ecosystem and marine species and human health, as well on air quality via burning sludge. The impacts of these substances, being bio-accumulative, must be analyzed.

74. In an email from 2017 from NPNS to a provincial official, NPNS admitted it could not meet the CCME standard for certain metals, such as mercury, lead, aluminum, cadmium, iron, selenium and zinc.[62]

75. As mercury has been detected in raw effluent from the mill as recently as 2017[63], it requires assessment against mercury specific guidelines. The main route of exposure for wildlife in aquatic ecosystems is the consumption of contaminated aquatic prey species such as fish. To address this route of exposure there is a methylmercury CCME tissue residue guideline for protection of wildlife consumers of aquatic biota.[64] As the effluent will contain mercury, an assessment against the guideline should be conducted. Existing mercury levels in aquatic biota near the outfall should be measured, and the bio-accumulation that may occur from the exposure to the mercury in the effluent should be compared to the guideline. There is no indication that this guideline was reviewed and taken into account within the NPNS studies.

76. In a letter to NPNS dated June 14, 2017, NSE advised NPNS that "a receiving water study should address all potential substances of concern, not limited to those outlined in the Pulp and Paper Effluent Regulations."[65] No such list of all potential substances of concern appear in the receiving water study despite the express requirement that a list be provided and addressed.

77. The June 14, 2017 letter went on to say that "[t]he information provided to the Department should include one year's worth of effluent characterization data." Partial test results are referred to but not provided from several years, including 2002, 2003 and 1999, although it is not explained why it is necessary to go so far back in time to obtain test results. In any event,

[62] Email dated April 7, 2017, NP to Gary Porter, TIR with attached table (Appendix H-5)
[63] Test results were provided by Ken Swain of the Boat Harbour Remediation Project in relation to raw effluent testing done in 2017 (Appendix H-1).
[64] Canadian Tissue Residue Guidelines for the Protection of Wildlife Consumers of Biota – Methylmercury, CCME 2000. http://ceqg-rcqe.ccme.ca/download/en/294?redir=1551877575
[65] Letter to the NPNS General Manager, from Nova Scotia Environment, Engineering Specialist, dated 14 June 2017, p. 1 (Appendix H-6).

it does not appear that effluent characterization data for one full year appears in the materials filed by NPNS within this EA. These are glaring omissions, and without such information, the environmental impacts of harmful substances on receiving waters cannot be addressed.

8. Canso chemical site and mercury contamination

78. Dr. Meg Sears has prepared comments on the NPNS EA. The report from Dr. Sears speaks for itself and we present this report to the Minister for her consideration on this EA.[66]

79. As stated in Dr. Sears' report, serious mercury contamination issues are associated with the former Canso chemical chloro-alkali plant at the NPNS site.[67] This site is very close to, or immediately adjacent to, the site proposed for the new ETF.

80. The dangers presented by mercury and methylmercury are discussed above. It is a serious omission in this NPNS EA that there be no discussion of any environmental effects, or any discussion at all, in the NPNS materials in relation to the Canso site, and the mercury contamination. Likewise, there is no discussion about how construction of the ETF would affect the mercury contamination present in the bedrock and on the site. As Dr. Sears says, such information and analysis should be an essential component of any EA process.[68]

9. Failure to conduct primary studies and obtain baseline data

81. Section 8 of NPNS's EA materials, which is titled "Environmental Effects Assessment," focuses on 17 identified "Valued Environmental Components" (VECs). For over 50% (9/17) of the VECs examined in this section, NPNS failed to conduct its own primary research to determine baseline conditions. The following list identifies the VECs for which NPNS did not complete primary studies:

a) VEC: Freshwater Fish and Fish Habitat

EA Registration Document, Section 8.6.2.1, p 205: "It is noted that fall 2017 to summer 2018 field investigations were undertaken at the replacement ETF site, but an

[66] Dr. Margaret Sears, *Comments regarding the Northern Pulp Nova Scotia Environmental Assessment Registration Document, Replacement Treatment Facility*, March 8, 2019 (Appendix F-1).
[67] Dr. Sears' report, at p. 4 (Appendix F-1) . Partial decommissioning report for Canso site (Appendix H-2).
[68] Dr. Sears' report, at p. 4 (Appendix F-1).

alternate pipeline route was selected in the fall of 2018 […] and due to the timing of route selection, only a preliminary reconnaissance site visit was undertaken."

b) VEC: Wetlands

EA Registration Document, Section 8.7.2.3, p 224-225: "It should be noted that fall 2017 to summer 2018 field investigations were undertaken at the replacement ETF footprint area and surrounding area, but as an alternate pipeline route was selected in the fall of 2018 […] and due to the fall/winter timing of route selection, only a preliminary reconnaissance visit of the pipeline footprint area was undertaken."

c) VEC: Flora/Floral Priority Species

EA Registration Document, Section 8.8.2, p 245: "It is noted that fall 2017 to summer 2018 field investigations were undertaken at the replacement ETF footprint site, but an alternate pipeline route was only selected in the fall of 2018 […] and due to the fall/winter timing of route selection, only a preliminary reconnaissance visit was undertaken."

d) VEC: Terrestrial Wildlife/Priority Species

EA Registration Document, Section 8.9.2, p 269: "It is noted that fall 2017 to summer 2018 field investigations were undertaken at the replacement ETF site, but an alternate pipeline route was selected in the fall of 2018 […] and due to the timing of route selection, only a preliminary reconnaissance visit was undertaken."

e) VEC: Migratory Birds and Priority Bird Species/Habitat

EA Registration Document, Section 8.10.2.2, p 290: "[…] the proposed location of the pipeline changed following the completion of the avian program. As such, a significant portion of the [Project Footprint Area] (in the pipeline corridor) has not been surveyed for avian [Species of Conservation Concern] and/or [Species At Risk]."

f) VEC: Harbour Physical Environment, Water Quality, and Sediment Quality

EA Registration Document, Section 8.11.2, p 337: "The description of the existing conditions for the harbour physical environment, water quality, and sediment quality in the Northumberland Strait, Caribou Harbour, and Pictou Harbour is based on the results of previous research and existing scientific literature and environmental assessments; no field work was conducted as part of this EA Registration."

g) VEC: Marine Fish and Fish Habitat

EA Registration Document, Section 8.12.2, p 358: "The description of existing conditions is based on the results of previous research and existing scientific literature and environmental assessments; no field work was conducted as part of this EA Registration."

h) VEC: Marine Mammals, Sea Turtles and Marine Birds

EA Registration Document, Section 8.13.2, p 387: "The description of existing conditions for marine mammals, sea turtles, and marine birds in the Northumberland Strait is based on the results of previous research and existing scientific literature and environmental assessments; no field work was conducted as part of this EA Registration."

i) VEC: Marine Archaeological Resources

EA Registration Document, Section 8.16.2, p 458-459: "The assessment of effects on marine archaeological resources is based on background research and analysis of relevant geophysical and remote sensing data. […] An [Archaeological Resource Impact Assessment] of the marine environment has not been completed for this project but will be completed prior to construction."

82. The absence of this basic baseline research means that NPNS cannot accurately identify or describe the environment into which it proposes to introduce unknown toxic substances. In other words, NPNS cannot name the mammals, birds, fish, or plants, or describe the wetlands or harbour environment that will be impacted by its ETF with any certainty because it has not done the research.[69]

83. Instead of conducting its own primary research, NPNS purports to rely on previous research and existing scientific literature to support its assessment and its conclusion that there will be "no significant adverse residual environmental effects" on any of its identified VECs. However, this is highly problematic because the primary research cited by NPNS (or cited in the literature upon which NPNS relies) in many cases dates back decades.

84. For example, the Atlantic Canada Conservation Data Centre (AC CDC) report relied on by NPNS in support of its evaluation of the potential impacts on various species (including birds,

[69] MacKay, A.A., *Northern Pulp's Effluent Disposal Plans – Issues and Answers*, February 2019 (MacKay report)(Appendix C-1), regarding the necessity of conducting baseline surveys

terrestrial wildlife, marine mammals, fish, sea turtles, and others) purports to identify the species "known to occur" in the vicinity of the ETF project.[70] However, the majority of the data relied upon by AC CDC is over a decade old – and in some cases dates back over 50 years.[71] It is trite to state that the species residing in any particular area change over time. In the absence of current research, NPNS cannot purport to identify the species that may be affected by its project, much less evaluate the potential impacts on those species.

85. Similar conclusions can be drawn with respect to the non-species related VECs listed above (with the exception of the "wetlands" VEC, for which NPNS cites no research whatsoever in relation to the wetlands impacted by the new pipe route[72]).

86. It is particularly important to note once more that NPNS has not conducted baseline studies for over half of the environmental components that it purports to evaluate. In the absence of this critical information, it is impossible to understand how NPNS can conclude that its project will have "no significant adverse residual environmental effects" on any of the identified VECs. In our respectful submission, as a result of this glaring gap in NPNS's EA materials, the Minister cannot conclude with any certainty that the proposed ETF will have no significant environmental effects that cannot be mitigated. As a result, she cannot legally approve the proposed project.

87. Arthur MacKay has authored a commentary on aspects of the NPNS EA, and on behalf of FONS we hereby submit it to the Minister for consideration.[73] Mr. MacKay is an experienced fisheries biologist and consultant.[74] He co-authored an extensive study on the long-term effects of a pulp and paper mill, along with other industrial activity, on the St. Croix estuary in New Brunswick.[75]

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[70] NPNS Registration Document, Appendix N, p 1.
[71] NPNS Registration Document, Appendix N, p 18-21.
[72] NPNS Registration Document, Appendix O3.
[73] MacKay, A.A., *Northern Pulp's Effluent Disposal Plans – Issues and Answers*, February 2019 (MacKay report)(Appendix C-1)
[74] Art MacKay cv (Appendix C-1).
[75] Arthur MacKay, et al., 2010, "The St. Croix Estuary 1604 – 2004". It can be found at: https://issuu.com/artmackay/docs/healthofstcroixestuary

88. Mr. MacKay notes that NPNS has done few if any primary surveys to determine the vital ecosystem components of the target areas. He notes that the NP submission discusses mainly commercial fish species. While such species are important, it is not the full picture. He writes:

> …the foundational species of the ecosystem such as planktonic species, invertebrate and fish larvae, subtidal and intertidal invertebrates and plants, forage species, etc are not considered. Seasonality is an important issue and to truly understand ecosystem dynamics, at least 12 monthly surveys must be undertaken that include records for plankton, fish and invertebrate larvae, forage species, fish, bird, and mammals.[76]

89. His report provides some parameters that ought to have been followed in conducting baseline surveys for local species, as well as to obtain baseline chemical analyses.

90. Mr. MacKay warns that, in the absence of this basic information, the impact of the effluent from the proposed outfall pipe at Caribou Harbour or the proposed cleanup in Boat Harbour cannot be measured in the short term or long term.[77]

91. He concludes as follows:

> Frankly, in relation to the proposed pipeline, no work should begin until professional ecosystem surveys are undertaken at Caribou Harbour, Northumberland Strait at Caribou Harbour and Northumberland Strait at the Boat Harbour outfall (vital for comparison purposes). **In the absence of these necessary surveys, the Minister must be made aware that there can be no confidence in the purported lack of impacts stated and implied in the Northern Pulp environmental submission**. …[78]

j) Other missing studies

92. In addition to the missing studies identified above, the following are also absent:

(i) Baseline studies on Caribou Harbour and Caribou Channel. NPNS instead uses Pictou Harbour as a proxy (although no baseline study was conducted for Pictou Harbour either);[79]
(ii) Baseline data for the larger Strait area, regarding water quality and other municipal, industrial and agricultural discharges into the waters of the Strait;

[76] MacKay report, p. 3 (Appendix C-1).
[77] MacKay report, at p. 3 (Appendix C-1).
[78] MacKay report, p. 5 (Appendix C-1).
[79] NPNS EA Submission, Section 8.11.1, p. 336.

(iii) Studies regarding impacts of effluent from kraft pulp mills (without delignification) on species present in the Strait, including lobster, crab, herring and foundational ecosystem species;[80]
(iv) Engineering reports or drawings regarding the construction of the shoreline and marine portions of the pipeline, the route it will follow and how deeply it can be buried;
(v) Analysis or engineering study of the impacts of ice scour on buried HDPE pipe;
(vi) Modelling of effluent transport and dispersion from pipeline breaks, ruptures and leaks in marine, shoreline and terrestrial environments;
(vii) Air emissions data from current operations from all stacks and vents;
(viii) Studies showing the nature and frequency of process interruptions and disruptions, leaks and spills at the NPNS facility and the impacts of same on effluent composition;
(ix) Report and analysis on the Canso chemical site and mercury contamination and how it may be impacted by the construction and operation proposed ETF, and/or how it may impact effluent composition and risks of mercury contamination to the environment and human health, and
(x) Baseline data and cumulative effects of the project on the larger Northumberland Strait, taking into account other discharges and activities already affecting the Strait as a whole.

10. Long-term effects

93. A discussion of potential long term effects of the ETF project is noticeably absent from the NPNS EA submission as all impacts are deemed not to be residual. However, as identified throughout this submission, there are many potential and likely long-term effects that have not been meaningfully assessed. As per the Fringer Report, discussed below, had Stantec correctly used the models that were available, they would have discovered that it is likely that effluent will accumulate in Pictou and Caribou Harbours[81], and solids will settle out of the discharged effluent and onto the seabed.[82] Likewise, the long-term impacts of bio-accumulation of metals requires assessment for long term impacts on human and ecosystem health, and on the economics of the fishery.[83] Without it, the Minister cannot make a decision on the EA.

94. Arthur MacKay, in his report discussed above, notes the longer term impacts that should be expected due to exposure to effluent on an ongoing basis. This would include biological

[80] MacKay report, p. 3, discussion of "foundational species of the ecosystem" (Appendix C-1).
[81] Fringer report, p. 1 (Appendix A-1)
[82] Fringer report, pp. 4-5. (Appendix A-1)
[83] Discussed below. See also report by Dr. Sears, Appendix F-1.

magnification of toxins in the Harbour and Strait, and impacts on a broad range of marine organisms, including plankton, fish larvae, fish, birds, marine mammals and humans. He also notes creation of anoxic "dead zones," declines in marine invertebrates, fish, and some birds and mammals, and fishery closures due to the presence of toxic chemicals in fish caught for human consumption. All these effects, and many others, were observed and documented in his St. Croix study.[84]

11. Cumulative effects

95. The NPNS EA materials contain almost no discussion of the larger environment of the Strait and the southern Gulf, and the role of Caribou Channel and Caribou Harbour within that context. The discussion of cumulative effects in section 12 of the NPNS EA materials sets an artificially small area within which cumulative effects are examined. Even within that boundary, effects of agricultural activity are not discussed, and the impacts of existing municipal wastewater discharges are not taken into account. Further, due to the boundary in the EA submission, there is no discussion of the macro conditions in the Strait. No effort was made to take baseline measurements or to assess the carrying capacity of the Strait's Ecosystem overall and how it may be able to handle the proposed effluent discharge, or how that discharge may affect more distant parts of the Strait due to overall flows, currents and dynamics. The entire EA package and the discussion regarding cumulative effects are based on the findings of the Stantec modelling exercise, which is fundamentally flawed[85] and which fails to take into account what will happen to the effluent trail once it passes out of the immediate vicinity of Caribou Channel.

96. The cumulative impacts of current discharges of from agricultural activities, and from industrial and municipal wastewaters, emanating from Nova Scotia, New Brunswick and Prince Edward Island, are not examined. The role of climate change, and how it might interact with the project and impact consultant predictions, is likewise absent from the discussion.

[84] MacKay report, at pp 4-5. (Appendix C-1)
[85] See Dr. Fringer's report (Appendix A-1) and the discussion below regarding the Stantec modelling exercise.

Despite the presence of section 12 of the submission, the NPNS EA materials provide no comprehensive analysis of cumulative environmental effects.

12. Pulp and Paper Effluent Regulations

97. The *Fisheries Act*, coupled with the *Pulp and Paper Effluent Regulations* (*PPER*) permit discharge of pulp and paper effluent, up to certain measurable limits for certain characteristics.[86] However, mere compliance with the *PPER* does not prevent adverse effects or significant environmental effects that cannot be mitigated.

98. It is noted that the *PPER* are currently under review, with the goal of tightening them up, as up to 70% of pulp and paper mills still are considered to be harming the environment despite alleged compliance with the *PPER*. On February 1, 2019, Environment and Climate Change Canada officials appeared before the Standing Committee on Agriculture and Fisheries of the Prince Edward Island Legislature. In that appearance, an ECCC official stated, in part:

> Despite this high level of compliance with the existing effluent standard, the environmental effect studies have shown that the effluents from 70% of the pulp and paper mills across the country are having an effect on fish and/or, depending, fish habitat.[87]

99. The official also confirmed that the NPNS mill was included in the 70% of mills whose effluents are having an "impact on fish habitat".[88]

100. It is noted that the current conditions within Boat Harbour Basin have occurred, and continue to occur, despite ostensible regulatory compliance with the *PPER* over several decades.

13. Source of Mixing Zone Concept

101. The NPNS Submission and the receiving water studies on which it relies are based, in large part, on the misapplication of the concept of a 100 metre "standard mixing zone", within which

[86] *Pulp and Paper Effluent Regulations,* SOR/92-269 (*PPER*). The *PPER* are made under the *Fisheries* Act, R.S.C. 1985, c. F-14. See also the *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations*, SOR/92-267 made under the *Canadian Environmental Protection Act, 1999*, S.C. 1999, c. 33.
[87] Standing Committee Minutes, 1 Feb. 2019, p. 3 (Appendix H-13).
[88] Standing Committee Minutes, 1 Feb. 2019, p. 5 (Appendix H-13).

effluent components are projected to dilute to "background levels." In reality, the mixing zone that is proposed completely fails to comply with the basic requirements of a mixing zone, no matter what standard is applied. A mixing zone is entirely inappropriate given the realities of the receiving environment of Caribou Channel and Caribou Harbour.

102. The NPNS EA Submission states:

> Additionally, the project is designed with key established water quality guidelines and/or will meet ambient water quality (current background) at the edge of a standard mixing zone (CCME 2009 - Canada-wide Strategy for the Management of Municipal Wastewater Effluent)..[89]
> …
> The mixing zone for the discharged effluent was defined as the 100-m distance from the outfall pipe as per the Canadian Council of Ministers of the Environment (CCME) guidelines.[90]

103. NPNS cites CCME 2009 (Canada-wide Strategy for the Management of Municipal Wastewater Effluent) and the Atlantic Canada Wastewater Guidelines Manual as authority for its use of a mixing zone.[91] However, CCME 2009 is a municipal waste water guideline, which applies to government or public owners[92], not to private industrial pulp and paper mills like NPNS. Similarly, the Atlantic Canada Wastewater Guidelines Manual addresses municipal sewage, and not pulp and paper effluent.[93]

104. The significant differences between municipal waste water and pulp and paper effluent are underscored by the reality that they are regulated by two mutually exclusive sets of regulations made under the Fisheries Act. Municipal waste water is regulated via the *Wastewater Systems Effluent Regulations*[94], whereas pulp and paper effluent is governed by the PPER, as discussed

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[89] NPNS EA Submission, Registration Document, Section 5.6.1, p. 84.
[90] Stantec, Addendum Receiving Water Study, December 19, 2019, p. i, Executive Summary, NPNS EA Submission, Appendix E1.
[91] Stantec, Addendum Receiving Water Study, December 19, 2019, Section 3.1.2, p. 3.52, NPNS EA Submission, Appendix E1.
[92] *Canada-wide Strategy for the Management of Municipal Wastewater Effluent*, Canadian Council of Ministers of the Environment (CCME 2009). See definitions of "Municipal Wastewater Effluent" and "Owner" which do not include a private industrial operator like NPNS. Accessible at the following link: https://www.ccme.ca/files/Resources/municipal_wastewater_efflent/cda_wide_strategy_mwwe_final_e.pdf
[93] Atlantic Canada Wastewater Guidelines Manual, Environment Canada, 2006. The manual is an update of the former *Atlantic Canada Standards and Guidelines Manual for the Collection, Treatment and Disposal of Sanitary Sewage,* 2000 edition. https://novascotia.ca/nse/water/docs/AtlCanStdGuideSewage.pdf
[94] *Wastewater Systems Effluent Regulations* SOR/2012-139 (*WSER*). Subsection 2(5) of the *WSER* provides that the waste water regulations do not apply in respect of pulp and paper mills.

above. It is therefore in doubt whether CCME 2009 has any application to pulp and paper effluent and this EA.

105. It is questionable whether the CCME 2009 guidelines even continue to apply in relation to municipal wastewater, as they may have been superseded by the *Wastewater Systems Effluent Regulations*[95]. Under those regulations, made in 2012, the only 100 m mixing zone contemplated relates to discharge of municipal wastewater containing un-ionized ammonia. No comparable mixing zone is employed in the Fisheries Act or PPER relation to any pulp and paper effluent constituents.

14. Mixing zone does not apply in the context of outfall CH-B

106. Further, and more importantly, a mixing zone may not be used <u>at all</u> unless it satisfies important preconditions or requirements. These requirements are not discussed in NPNS's EA Submission. When they are considered, it becomes apparent that the proposed, or any, mixing zone is not appropriate at the outfall location proposed by NPNS and does not comply with CCME or NSE direction.

107. Nova Scotia Environment discussed the requirements for a mixing zone in correspondence to NPNS dated June 14, 2017.[96] The letter says, in part:

> A mixing zone is defined as an area of water contiguous to a point source discharge. A mixing zone is, under no circumstances, to be used as an alternative to reasonable and practical treatment….it is only one factor to be considered in establishing effluent requirements.
>
> …As a general principle, the use of mixing zones should be minimized and limited to conventional pollutants. The mixing zone principle does not apply to hazardous wastes…. Mixing zones also do not apply to bio-accumulative or persistence [sic] substances and despite the allowance of a mixing zone, effluent shall not be acutely toxic.
>
> …Mixing zones cannot interfere with other water uses such as…active fisheries… .[97]

[95] *Wastewater Systems Effluent Regulations* SOR/2012-139 (*WSER*). Subsection 2(5) of the *WSER* provides that the waste water regulations do not apply in respect of pulp and paper mills.
[96] Letter to the NPNS General Manager, from Nova Scotia Environment, Engineering Specialist, dated 14 June 2017 (Appendix H-6).
[97] Letter to the NPNS General Manager, from Nova Scotia Environment, Engineering Specialist, dated 14 June 2017, p. 1 (Appendix H-6). The requirements for a mixing zone set out in this letter are similar to those found in the

108. Contrary to the directions in the June 14, 2017 letter, the mixing zone proposed by NPNS in this EA does not consider meaningfully, or in some cases even note the existence of, biotic communities and spawning areas, and the information provided about spawning areas is not accurate.[98] As well, given the presence of mercury and other bio-accumulative metals and compounds, the proposal does not comply with the requirement that no such substances be discharged within a mixing zone. Further, as CH-B is positioned within one of the last remaining herring spawning areas in the Strait, and within an important lobster fishing area,[99] it violates the express requirement that "mixing zones should not impinge upon…important fish spawning and/or fishing areas". [100] The Caribou Channel is in the middle of an extremely active fishery, yet this is not mentioned by the consultants who purport to apply the "CCME guidelines" that require such factors to be considered.

109. The NPNS submission fails to conduct any analysis of whether a mixing zone can actually be used at CH-B. There is no actual application of the NSE or CCME guidance. When the criteria are reviewed, NPNS fails most of them. The mixing zone concept cannot be applied to CH-B, and consequently, it is irrelevant how soon the substances within the effluent meet background conditions. The diffuser would be discharging harmful substances, including metals and solids, directly into a living ecosystem and spawning grounds, which supports an active fishery.

110. Caribou Channel is not an artificial 100 m dead zone which can be continuously loaded with effluent without consequence. The NP submission is based on an incorrect standard. In reality there is no water quality guideline which permits discharge of effluent into a spawning and active fishing area.

Guidelines on the Site-Specific Application of Water Quality Guidelines in Canada: Procedures for Deriving Numerical Water Quality Objectives, CCME 2003. http://ceqg-rcqe.ccme.ca/download/en/221

[98] For more accurate information about herring spawning zones, see Egilsson, G., and MacCarthy, A., Caribou Harbour and Caribou Channel - dynamics, tides, ice, marine species and fisheries, February 21, 2019 (Appendix B-1).

[99] Egilsson, G and MacCarthy, A. (Appendix B-1).

[100] Letter to the NPNS General Manager, from Nova Scotia Environment, Engineering Specialist, dated 14 June 2017, p. 1 (Appendix H-6)..

15. Receiving environment – receiving water studies and near and far field modelling

111. The Stantec Receiving Water Studies, on which much of the NPNS EA is founded, are unreliable and the modelling exercise undertaken was not appropriate for the receiving environment. FONS submits that the Receiving Water Studies, and other materials based on the conclusions of those studies, must be disregarded and new, properly conducted studies must be included in an EA report.

112. A critique of the Stantec Receiving Water Studies has been prepared by Dr. Oliver Fringer of Stanford University, Stanford California USA and is appended to this submission.[101]

113. Dr. Fringer is an Associate Professor (with tenure), Department of Civil and Environmental Engineering, Stanford University. He is an oceanographer with expertise in numerical modelling of coastal dynamics.[102]

114. Dr. Fringer's report speaks for itself and we hereby submit it to the Minister for a detailed and thorough review. In summary, Dr. Fringer concludes that Stantec did not implement the MIKE 21 far-field model and the CORMIX near-field model appropriately. In this case, Stantec's implementation problems are significant. Dr. Fringer concludes that they lead:

> … to the incorrect conclusion that the environmental impacts will be negligible because the effluent concentrations are predicted to be unphysically low. **Instead, correct implementation of the models with more conservative and physically realistic scenarios would show that effluent concentrations in the region could be much larger and that effluent accumulation in Pictou and Caribou Harbours is likely.**[103] [emphasis added]

115. In this regard, Dr. Fringer states that Stantec's use of the two-dimensional MIKE 21 model is inappropriate as it fails to take into account local dynamics caused by wind, river inflows, offshore currents, ice, waves and storm surge. Due to the highly three-dimensional circulation in the region, a three-dimensional model (MIKE 3) should have been used to model the

[101] Fringer, O.B., *Review of near- and far-field modeling studies by Stantec Consulting for the Northern Pulp effluent treatment facility replacement project*, 7 March 2019 (Appendix A-1) (Fringer report)
[102] Oliver Fringer, CV, (Appendix A-2)
[103] Fringer Report, p. 1. (Appendix A-1)

behaviour of the effluent in the receiving water environment in relation to the outfall at CH-B, and the surrounding area.[104]

116. In this regard, we note that in May 2017 KSH recommended 3-D modelling be done in relation to alternative outfall locations D and D2.[105] Whether or not this recommendation was implemented, no 3-D far field modelling results have been provided within any reports filed within this EA despite the necessity of using 3-D far field modelling in generating accurate and reliable results.

117. Likewise, Dr. Fringer concludes that significant implementation issues in using the CORMIX near-field model have created unreliable results in the Receiving Water Studies. The ambient tidal current used to drive the CORMIX model is modelled by Stantec as much stronger than it would actually be during a neap tidal period. Tidal currents are even weaker during winter when ice cover decreases the strength of the tides. The CORMIX model also overestimates salinity as it does not take into account potential river inflow, which in turn leads to an overestimation of buoyancy and dilution.[106]

118. Dr. Fringer further notes that the Receiving Water Studies do not take into account settling of suspended solids during slack tides within 100m of the outfall, despite the potential for settling of such solids.[107]

119. Dr. Fringer notes:

> During each one-hour slack tide period, 173 kg of suspended solids would be discharged into the ocean from outfall CH-B. The solids that were discharged 30 minutes before slack tide would find themselves just 45 meters from the outfall, only to be transported back over the outfall again at the end of the next 30 minutes to be re-entrained into the outfall plume.
>
> … Furthermore, owing to the reduction in vertical turbulent mixing because of the weak currents during slack tides, there is a strong potential for the suspended solids in the effluent to settle out of the water column and onto the bed in the vicinity of the outfall.

[104] Fringer Report, p. 7 (Appendix A-1)
[105] Email May 29, 2017, KSH to NPNS and TIR, Alt D 2D modelling results (Appendix H-3).
[106] Fringer report at pp. 2 and 18-20 (Appendix A-1)
[107] Fringer Report, pp 4-5 and 21 (Appendix A-1)

> The effects of slack tides and the potential for settling of suspended solids is not discussed in the Stantec studies.[108]

120. Based on this clear and expert critique, FONS submits that the Receiving Water Studies do not provide sound information and data to the Minister that would permit the Minister to accept the conclusions of those Studies, or to conclude that discharge of effluent at the outfall will not cause adverse effects or significant environmental effects that cannot be mitigated. Rather, the critique requires the conclusion that the Receiving Water Studies cannot reliably determine the likelihood that adverse impacts or significant environmental effects will occur that cannot be mitigated in the receiving environment. As these studies form the backbone of the NPNS submission, NPNS has failed to discharge its onus to demonstrate that its proposal to discharge effluent into the Strait will not cause harm.

121. In addition, as discussed above regarding the mixing zone concept, NPNS has failed to provide and analyze certain types of information, within the Receiving Water Studies.

122. For all these reasons, the Receiving Water Studies must be rejected and their conclusions disregarded.

16. Local knowledge

123. We submit for the Minister's consideration three local knowledge summaries from individuals who have particular and detailed knowledge about local conditions.

1. Egilsson, G., and MacCarthy, A., Caribou Harbour and Caribou Channel - Dynamics, tides, ice, marine species and fisheries, February 21, 2019 (Appendix B-1);
2. Letter from Rob MacKay, Master Diver, dated March 5, 2019 (Appendix B-2); and
3. Letter from Barry Sutherland, dated March 4, 2019 (Appendix B-3).

124. Allan MacCarthy and Greg Egilsson are experienced fisherman who have fished in the immediate vicinity of the proposed outfall CH-B in Caribou Channel. Rob MacKay is a Master Diver with experience over three decades of diving in the Pictou area. Barry Sutherland has

[108] Fringer Report, pp 4-5 (Appendix A-1)

been fishing the Caribou area for 27 years. Between them they have lifetimes of observations about local conditions, including winds, currents, tides, ice and marine species.

125. Their summaries and letters speak for themselves.

126. Mr. Sutherland, Mr. MacCarthy and Mr. Egilsson are three of about eighty-two lobster fishers who fish in that area, including fishers from the Pictou Landing First Nation.

127. The three submissions listed above contain a wealth of information that was never gathered by any of NPNS's consultants. The actual observations described in these submissions provide real information which often contradicts the assumptions made within the NPNS materials, including the Stantec Receiving Water Studies.

128. Notably, the Receiving Water Studies fail to take into account crucial local conditions when they assess how the effluent would behave after discharge at CH-B. Mr. MacCarthy and Mr. Egilsson describe local currents, such as the Pictou Island counter clockwise gyre current. These submissions demonstrate that the Studies, and the NPNS submission generally, vastly underestimate the effects of ice, wind, tide and other dynamics, and demonstrate the vulnerability of a plastic pipe placed on, or buried in, the floor of Caribou Harbour and the Caribou Channel.

129. Among other things, Mr. Egilsson and Mr. MacCarthy note that the proposed outfall CH-B would be positioned within Mr. Egilsson's current lobster fishing area, very near to where he places his first traps of the day in lobster season. Mr. MacCarthy's lobster fishing area is immediately adjacent to CH-B and the entire area is a very active fishing zone. Many species are fished there, over the course of each year. Mr. Egilsson and Mr. MacCarthy also note that:

> **The proposed outfall CH-B is located in the middle of the last major active spawning area for Area 16F herring. Herring spawning grounds have compressed in the past few years as the stock has declined. Very little herring spawning occurs anywhere else in the Eastern Gulf.**[109] [emphasis added]

[109] Egilsson, G., and MacCarthy, A., Caribou Harbour and Caribou Channel - dynamics, tides, ice, marine species and fisheries, February 21, 2019 (Appendix B-1), at page 3 (Appendix B-1).

130. Likewise, Mr. MacKay has had a unique opportunity to observe the sea bottom in the Caribou area over the past several decades. He provides detailed information regarding the power and reach of ice and ice scour and how it can move extremely heavy items, as well as the soft shifting sea bottom in the area, and how these conditions could affect the effluent pipe that NPNS proposes to run through that area:

> The channel shifts from time to time mostly due to storms. Ice and tide also move sand around as it is very shallow in this area. Storms can pile ice up to 30 feet high which can dig deep into the soft bottom. This could damage the buried pipe.
>
> ...If the pipe is covered in armour stone, the sand on either side will be undermined by wind and wave action exposing the pipe to the full force of the ice in winter. If no armour stone is used, those same fall storms could easily expose the pipe, as anyone living near a beach knows how easily sand is shifted by storm winds and waves. Either way the pipe is unlikely to survive extreme conditions in this area.
>
> …The sea bottom in the area of the proposed pipe is very fragile. It's mostly sand and in the inner harbour, mud and eel grass. The eel grass is very fine and important to juveniles and larvae of lobster and crab.

131. Mr. Sutherland has shown that Caribou Harbour is a rock crab nursery. Rock crab are plentiful in that area, and are a food species which support lobster stocks. He writes, in part:

> Caribou Harbour is home to the largest commercial fishing fleet in the Northumberland Strait. The strong lobster catches in this area are the result of the continuous food supply from the rock crab nursery. The potential destruction of this crab habitat will have devastating consequences on the lobster industry in this area.[110]

132. He also expresses his concerns regarding the impact of noise and disruption from the installation and operation of the effluent pipeline and diffuser in this area.

133. These studies must inform any assessment of actual conditions in the area. Unfortunately, NPNS has failed to consider these issues in any significant way in its EA materials.

17. Monitoring and Accident Prevention

134. Throughout the lengthy period leading up to the current EA, members of the public expressed numerous concerns with respect to NPNS's ability to adequately monitor the proposed ETF

[110] Sutherland, at page 2 (Appendix B-3)

and to respond to accidents that could result in the unplanned release of treated or untreated effluent or other hazardous substances into the environment. NPNS has utterly failed to respond to these concerns in its EA materials. As a result, the Minister does not have enough information to make an informed decision as to whether spills from the proposed ETF may result in significant environmental effects and/or adverse effects.

135. In its EA materials, NPNS refers to an Environmental Protection Plan (EPP) and an Emergency Response and Contingency Plan (ERCP) that will be developed to address various aspects of its monitoring and accident response requirements. These plans will form part of an umbrella document known as an Environmental Management Plan (EMP).[111]

136. NPNS states that both the EPP and the ERCP will be prepared after it receives its EA approval.[112] In other words, neither the public nor the Minister will be given the information required to fully understand how NPNS intends to respond to spills, or monitor its ETF and mitigate the potential for accidents, until the project is well on its way to operation. Until that time, we are left only with vague statements indicating what the ERCP is "anticipated" to include[113] - and are told only that the EPP will address management and prevention of "accidents, malfunctions, or unplanned events".[114]

137. This lack of information is all the more problematic in light of the significant risks posed by ice coverage in Caribou Harbour and the Northumberland Strait. As per the MacCarthy and Egilsson submission, "[i]ce is typically present in the Caribou area from the end of December through April, but can set in earlier and remain later if temperatures are cooler than normal."[115] At a minimum, then, ice will be present in and around the NPNS pipe route for over 1/3 of the year. This ice includes "fast ice," which freezes to the bottom of the Harbour in shallower inshore areas.[116]

138. Common sense dictates that the ice, storms and other unpredictable marine conditions will hinder NPNS's ability to monitor its pipe and diffuser for damage and leaks, and to investigate

[111] NPNS Registration Document, section 5.3.1, p 49.
[112] *Ibid,* section 5.7.3, p 97 & section 10.5, p 533.
[113] *Ibid,* section 5.7.3, p 98.
[114] *Ibid,* s 10.5, p 533.
[115] MacCarthy & Egilsson, Appendix B-1, p 9.
[116] *Ibid.*

and repair spills in the marine environment. NPNS does not explain how it will conduct its monitoring and spill response activities in the presence of ice – in fact, its EA materials do not even acknowledge that ice may be an issue when it comes to monitoring and responding to spills. Likewise, the EA materials do not contain an examination of the particular effects of a prolonged and inaccessible effluent spill, at any point along the pipeline, or within the marine area under ice cover. Despite the lengthy ice-bound periods during the winter, and the significant possibility of damage by ice or other forces during the winter, NPNS provides no explanation of what could be done to protect the marine environment of Caribou Harbour or the Caribou Channel, before an opportunity arises to access and repair the damaged infrastructure. This is an obvious issue and a serious oversight that must be addressed prior to any EA approval.

18. Receiving environment – air quality

139. The ETF proposal includes the burning of sludge generated from effluent treatment. Like the effluent discussed above, the chemical composition of the sludge is largely unknown, and no studies have been provided analyzing the sludge composition and the impacts to air quality and human and environmental health from emissions arising from burning sludge.

140. Significant concerns exist in respect of burning sludge in the mill's power boiler, especially in combination with existing emissions at the mill. As noted by Dr. Sears, too little is known and provided about the composition of the sludge to provide any certainty as to whether air emissions will be problematic.[117] There is likewise a lack of information regarding toxic metals and polyaromatic hydrocarbons (PAHs) in air emissions.

141. Dr. Sears notes concerns regarding dioxins and furans associated with pulp mills.[118] She also notes an inaccuracy in the information provided by NPNS on this EA:

> It is stated in the EA Registration document (e.g., Table 6.7-1), "In fact, dioxins and furans testing for the last 5 years has consistently shown that all of the compounds required to be tested under the regulations have not been detected in NPNS' effluent (non-detect)." The dioxin-free message is not consistent with reports from Northern Pulp that are posted on the Nova Scotia government website,

[117] Dr. Sears' report, at p. 3 (Appendix F-1)
[118] Dr. Sears' report at pp. 10-12 (Appendix F-1)

> nor the data reported to the National Pollutant Release Inventory (NPRI).[17] NPRI data indicates that on average 3.6 tonnes of PAHs have been emitted to the air annually since 2006, and 8 mg TEQ dioxins/furans have been emitted annually since 2011.[119]

142. The NPRI data cited by Dr. Sears is appended to this submission.[120]

143. Dr. Sears also notes exceedances in air emissions of hydrogen sulphide associated with the mill.[121]

144. With respect to air quality, again actual testing of co-combustion of hog fuel and sludge in the power boiler has not occurred, but a "pilot study" is contemplated.[122] No explanation was provided as to why such testing could not have been done prior to the EA.

145. Air emission studies and information remain at best incomplete, and therefore an insufficient basis for any conclusion as to project environmental or health impacts. At worst, they show issues with emissions of dioxins and furans, and PAHs being emitted by the mill.

a) Hoffman report and rebuttal to Stantec critique

146. In a report in 2017, Emma Hoffman and co-researchers conducted a pilot study of air quality issues in the Pictou area.[123] The study investigated prioritized air toxic ambient VOC concentrations to determine whether these correlated with wind directions and whether there was an indication that toxic ambient VOCs were linked to the NPNS mill. The study acknowledged its limitations, but concluded that elevated levels of certain toxins were apparent when prevailing winds came from the direction of the mill.

147. At appendix K2, Stantec challenged these findings, and argued they should be disregarded. Ms. Hoffman answered the Stantec criticisms with an effective rebuttal, dated February 23, 2019 and attached to this package.[124] Ms. Hoffman described the Stantec article as containing

[119] Dr. Sears' report, at p. 11 (Appendix F-1)
[120] National Pollutant Release Inventory spreadsheet for NPNS, Appendix H-27.
[121] Dr. Sears' report, at p. 8 (Appendix F-1)
[122] NP EA Registration Document, Section 9.3, p. 519.
[123] Hoffman, E, et. al., *Pilot Study investigating ambient air toxics emissions near a Canadian kraft pulp and paper facility in Pictou County, Nova Scotia*, June 2017, Environ Sci Pollut Res 24(25):20685–20698 (Appendix E-1).
[124] Memo Hoffman, E., to Gunning, D. (Hoffman rebuttal), (Appendix E-1)

misrepresentations put forth by NPNS's EA of the scientific contributions her 2017 study provides. Ms. Hoffman's 2017 report, and her rebuttal speak for themselves, and we submit them to the Minister for consideration in this EA process.

148. Ms. Hoffman's rebuttal confirms the potential that toxic ambient VOCs are emanating from the mill:

> Compared to all other wind directions, prevailing winds from the northeast and the mill typically resulted in higher VOC concentrations for all compounds, except carbon tetrachloride, suggesting that the mill is likely a contributor to increased concentrations; however (as stated in the study), the origin(s) of VOCs are "*inconclusive*", and "*other local sources likely contribute to air toxics emissions*".[125]

149. Ms. Hoffman concludes as follows:

> In summary, the intent of this pilot study was to address local air quality conditions in a Nova Scotia rural community, which clearly indicates the need for further investigation. Moreover, this pilot study serves as a precursor to gaining awareness, so that government agencies adopt more stringent air quality regulations and monitoring programs to ensure health of all citizens is safeguarded and prioritized.[126]

150. We ask that the Minister likewise examine closely the data provided by NPNS in respect of air emissions, and the other aspects of this EA, and employ the precautionary approach when determining whether adverse effects or non-mitigable significant environmental effects will occur.

19. Human Health effects

a) Expert – Ellen Sweeney report

151. At Section 9.0 of NPNS's EA materials, we are provided with a "Human Health Evaluation". In theory, this section is intended to provide the Minister with the information she needs to evaluate whether the proposed ETF will cause "adverse effects" – which are defined in the

[125] Hoffman rebuttal, p. 2 (Appendix E-1)
[126] Hoffman rebuttal, p. 4. (Appendix E-1)

Environment Act as effects that impair or damage the environment, or change the environment in a manner that negatively affects "aspects of human health."[127]

152. Dr. Ellen Sweeney, Director of Strategic Research Initiatives at the Atlantic Partnership for Tomorrow's Health,[128] has reviewed and critiqued NPNS's Human Health Evaluation.[129] Dr. Sweeney's comments are appended to this submission for the Minister's review.

153. Overall, Dr. Sweeney concludes that the information provided by NPNS is far from sufficient to accurately assess the true impacts of the proposed ETF on the health of the surrounding communities.

154. Dr. Sweeney identifies numerous critical gaps in NPNS's Human Health Evaluation. For instance, NPNS states that specific effluent chemistry characteristics "will not be known with certainty until the project is operational."[130] As Dr. Sweeney notes, without detailed information identifying precisely what will be coming out of NPNS's proposed outfall, the Minister cannot possibly evaluate the risks and potential hazards with any degree of certainty.[131]

155. Additional flaws identified by Dr. Sweeney include the following: (1) a failure to provide supporting evidence relating to pulp and paper mill projects NPNS claims to be similar to its proposed ETF;[132] (2) a heavy reliance on a single study (the Toxikos report) pertaining to a project that was never built;[133] (3) a failure to examine potential fetal exposure to carcinogenic and endocrine disrupting chemicals;[134](4) a failure to evaluate the health risks associated with potential spills on land or in watersheds;[135] and (5) a failure to evaluate the potential health

[127] *Environment Act, supra* at s. 3(c).
[128] Dr. Sweeney, cv (Appendix G-2).
[129] Sweeney, E., *Comments on File No: 1003 – Environmental Assessment of Northern Pulp's Proposed Effluent Treatment Facility,* February 2019 (Appendix G-1) (Sweeney report).
[130] NPNS EA Submission, Registration Document, section 9.1, p 489.
[131] Sweeney report, Appendix G-1, p 4.
[132] *Ibid,* p 4.
[133] *Ibid,* p 4-5.
[134] *Ibid,* p 5.
[135] *Ibid,* p 10.

impacts of low dose cumulative exposures to toxic substances associated with the proposed ETF.[136]

156. Dr. Sweeney's report raises significant concerns with the quality and sufficiency of the Human Health Evaluation provided by NPNS. Given these critical flaws, the Minister cannot conclude with any certainty that the proposed ETF will not cause "adverse effects" that cannot be mitigated.

b) Expert - Daniel Rainham comments

157. Dr. Daniel Rainham of Dalhousie University has also critiqued various parts of NPNS's Human Health Evaluation.[137] Dr. Rainham is an Associate Professor and Director of Dalhousie's Environmental Science Department. He is also the Elizabeth May Chair in Sustainability and Environmental Health.[138] Dr. Rainham's report is appended to this submission for the Minister's review.

158. Dr. Rainham identifies similar concerns to those raised by Dr. Sweeney. For instance, he notes that NP did not provide detailed information with respect to the chemical composition of its effluent – although it was well within NPNS's capacity to do so.[139]

159. Additional information gaps identified by Dr. Rainham include the risks of exposure to emissions through methods such as the consumption of fish exposed to toxic substances,[140] and the chemical composition of the fine particulate pollution associated with the ETF project.[141] As a result of these and other flaws in NP's Human Health Evaluation, the Minister cannot accept NPNS's conclusion that there will be no significant impact on the health of the affected communities.

[136] *Ibid,* p 8-9.
[137] Rainham, D., *Comments on the document "Replacement Effluent Treatment Facility Project,* 5 March 2019 (Appendix D-1) (Rainham report).
[138] Dr. Rainham's CV (Appendix D-1).
[139] *Ibid*, p 2.
[140] *Ibid,* p 4.
[141] *Ibid,* p 5.

20. Conclusion

160. As stated in the first paragraphs of this submission, NPNS's Executive Summary advises that, on all aspects of the project, there will be no "significant residual environmental effects". As per the material submitted above, and the expert reports from qualified experts, this conclusion cannot stand. FONS submits that the information and analysis provided in this submission show that there is a very real possibility that adverse effects and non-mitigable significant environmental effects will occur in respect of the ETF project.

21. Decision Requested –ss 34(1) and 34(2) of the *Environmental Assessment Act* and ss. 13(1) of the *Environmental Assessment Regulations*

161. FONS submits that this submission and the accompanying Appendices have established that it is likely that the ETF project will cause adverse effects or significant environmental effects that cannot be mitigated. FONS therefore requests that the Minister reject the proposed undertaking pursuant to subsection 34(1)(f) of the *Environment Act* and subsection 13(1)(e) of the *Environmental Assessment Regulations.*

In the alternative, FONS submits that the evidence before the Minister establishes that there may be adverse effects or significant environmental effects caused by the undertaking that cannot be mitigated, and that an environmental-assessment report is therefore required, pursuant to subsection 34(1)(c) of the *Environment Act*, and subsection 13(1)(d) of the *Environmental Assessment Regulations.*

162. Further and in any event of the above, FONS requests that it be provided with a written statement of the decision rendered by the Minister in relation to the environmental assessment of the undertaking, setting out the findings of fact upon which it is based and the reasons for the decision, pursuant to subsection 10(4) of the *Environment Act.*

Dated March 8, 2019, at Halifax Nova Scotia.

James Gunvaldsen Klaassen

Sarah McDonald

APPENDICES