IN THE MATTER OF AN ARBITRATION
UNDER CHAPTER ELEVEN OF THE NORTH AMERICAN FREE TRADE AGREEMENT AND THE UNCITRAL ARBITRATION RULES

BETWEEN:

WILLIAM RALPH CLAYTON, WILLIAM RICHARD CLAYTON, DOUGLAS CLAYTON, DANIEL CLAYTON AND BILCON OF DELAWARE, INC.

CLAIMANTS

AND:

GOVERNMENT OF CANADA

RESPONDENT

Expert Report
By
Tony Blouin, Ph.D.

June 9, 2017

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I. QUALIFICATIONS

1. My name is Anthony Charles Georges Blouin, although I commonly use the first name Tony. I reside in Halifax, Nova Scotia, and am currently employed by the Halifax Regional Water Commission as Manager of Regulatory Compliance.

2. I have 30 years of working experience in environmental management and environmental assessment ("EA"). My education includes a B.Sc. from the University of Ottawa in Biology, an M.Sc. from the University of Toronto in Zoology (specialization in aquatic ecology), and a Ph.D. from Dalhousie University, Halifax (specialization in limnology, focussing on the effects of acid precipitation on lakes).

3. Since graduating with a Ph.D., I have gained experience as an environmental consultant with Lane Environment, Halifax (1983-1986 and 1995-1996), including preparation of environmental impact statements; as Water Quality Manager for the Department of Environment and Lands, Government of Newfoundland and Labrador (1986-1991); as Director of Environmental Assessments for the Department of Environment and Lands, Government of Newfoundland and Labrador (1991-1995), including chairing intergovernmental environmental assessment committees; as Manager of Environmental Performance for Halifax Regional Municipality (1996-2008), including acting as the proponent's key representative for the EA of the Halifax Harbour Solutions project; and as Manager of Regulatory Compliance for the Halifax Regional Water Commission (2008-present).

4. I have served two terms as the appointed Chair of the Nova Scotia Environmental Assessment Board (2004-2012), during which time I chaired panel reviews including public hearings, and prepared reports to the Nova Scotia Minister of Environment. I served as panel chair on the Highway 104 Bypass project (2005), the Keltic Petrochemicals and LNG Facility project (2006-2007), and the Goldboro LNG project (2013-2014). Through my service as a panel chair in these EAs I have developed a specific expertise in the Nova Scotia review panel process.

5. I also served as a provincial representative on the Regulatory Advisory Committee of the Canadian Environmental Assessment Agency during the development of the original *Canadian Environmental Assessment Act* ("*CEAA*") and related regulations.

6. My resume is attached as Annex 1 of this report. The opinions expressed in this report are my own.

II. PURPOSE OF THE REPORT

7. In the Award on Jurisdiction and Liability of March 17, 2015, a majority of this Tribunal determined that the Whites Point Joint Review Panel's ("JRP's") recommendation that the Whites Point Quarry should not be permitted to proceed on the basis of its "inconsistency with community core values" was a "fundamental departure from the methodology required by Canadian and Nova Scotia law."[1] The Tribunal found that "the Whites Point Quarry JRP was legally obligated under s. 16 of the *CEAA* to report on all factors mentioned there, including mitigation measures,"[2] but did not "explain why no mitigation measures at all were possible in respect of the 'community core values,' even if in the view of the JRP they would not have been entirely sufficient."[3] Bilcon was denied "a fair opportunity to know the case it had to meet and address it."[4] In light of these findings the majority of the Tribunal ruled that Canada breached its NAFTA obligations.

8. I was asked by the Government of Canada to provide my opinion as to the Whites Point JRP's potential recommendation in discharging its mandate under the Nova Scotia *Environment Act* ("*NSEA*") and the Nova Scotia *Environmental Assessment Regulations* ("*NSEAR*") if it had not conducted its review in a manner that breached NAFTA.

9. In preparing this Report, I reviewed the public record in the Whites Point EA, including applicable provincial legislation and regulations, the *Agreement concerning the Establishment of a Joint Review Panel for the Whites Point Quarry and Marine Terminal Project* (the "Joint Panel Agreement") and Terms of Reference, the Environmental Impact Statement Guidelines prepared by the JRP, the Environmental Impact Statement ("EIS") filed by Bilcon, subsequent interactions between Bilcon and the JRP, submissions made by governmental bodies, members of the public and Bilcon over the course of the JRP process, and the JRP Report itself.

[1] Award on Jurisdiction and Liability, ¶ 600.

[2] Award on Jurisdiction and Liability, ¶ 546.

[3] Award on Jurisdiction and Liability, ¶ 547.

[4] Award on Jurisdiction and Liability, ¶ 543.

10. My Report is organized as follows: in Part III, I provide an overview of the role and requirements of a review panel under the Nova Scotia EA regime. I highlight relevant provisions of the *NSEA* and *NSEAR*, and I explain how these shape the mandate of a review panel operating under Nova Scotia law, with specific reference to the mandate of the Whites Point JRP. In doing so, I also respond to statements made by the Claimants' environmental law expert, David Estrin, regarding the provincial EA process, and explain why I disagree with his conclusion that there is a "standard practice" in Nova Scotia for the approval of quarry and marine terminal EAs.

11. In Parts IV and V, I provide my opinion on the Whites Point JRP's potential recommendations had it not taken the approach described above that was found to have breached NAFTA. I specifically highlight some of the JRP's actual findings of adverse environmental effects that in my view were reasonably made in discharging its statutory mandate under Nova Scotia law. Additionally, I consider the other findings of the JRP that, in my view, were not supportive of a recommendation for project approval.

12. Based on my past professional experience as an EA review panel chair in the Province of Nova Scotia and my review of the EA record, it is my opinion that if the JRP had not committed the NAFTA breach, it was certainly not a foregone conclusion that the Whites Point project would have been recommended for approval under Nova Scotia law. To the contrary, the JRP made a number of findings in furtherance of its provincial mandate which provided a reasonable basis for a recommendation that the Whites Point project should be rejected.

III. THE ROLE AND REQUIREMENTS OF EA REVIEW PANELS IN NOVA SCOTIA

13. In this part of my Report I provide a general overview of the role and requirements of EA review panels in Nova Scotia, with specific reference to the applicable legislative and regulatory context in which review panels operate and the example of the Whites Point JRP. This part of my Report provides context for the findings I make in Parts IV and V.

14. As a preliminary matter, I note that the Whites Point project was required to undergo both a provincial and federal EA. This was accomplished by way of an EA conducted by a JRP, as

agreed to by the federal and provincial governments.[5] While the JRP process serves the goal of creating a common forum for two or more EA processes to be carried out, the EA requirements of the *NSEA* must still be satisfied. In the case of the Whites Point EA, this was expressly recognised in the Joint Panel Agreement, which provided that the "Panel shall conduct its review in a manner that discharges the requirements set out in the *Canadian Environmental Assessment Act*, Part IV of the Nova Scotia *Environment Act*, and the Terms of Reference attached hereto as an Appendix."[6]

15. As noted above, my comments focus solely on the Whites Point JRP's Nova Scotia mandate. I understand that the Expert Report of Lesley Griffiths addresses the JRP's federal mandate.

A. Review Panels Serve an Advisory Role in the Nova Scotia EA Process

16. Under the Nova Scotia EA process, a review panel, including a JRP tasked with carrying out a harmonized federal-provincial review, serves in an advisory role to the Nova Scotia Minister of Environment (the "Minister"), who has the ultimate authority to approve or reject an undertaking.[7]

17. In my experience, review panel members are typically appointed for their relevant expertise in environmental issues, and in particular for their expertise relating to the nature of the proposed undertaking and its possible environmental effects. In the case of the Whites Point project, this approach is reflected in s. 3.3 of the Joint Panel Agreement, which provided that "Panel members shall be unbiased and free from any conflict of interest relative to the Project and are to have knowledge or experience relevant to the anticipated environmental effects of the

[5] Where an undertaking is subject to the EA requirements of another government in Canada, s. 47(1) of the *NSEA* provides that the Minister may enter into an agreement with the other government to provide for the carrying out of the assessment in whole or in part for the purpose of Part IV of the *NSEA* or to review the undertaking under any enactment. See **R-5**, Nova Scotia *Environment Act*, 1994-95, c. 1, s. 47(1)(b) ("*NSEA*").

[6] **C-363**, *Agreement concerning the Establishment of a Joint Review Panel for the Whites Point Quarry and Marine Terminal Project between the Minister of the Environment, Canada and the Minister of the Environment and Labour, Nova Scotia* (Nov. 3, 2001), s. 4.1 ("Joint Panel Agreement").

[7] **R-5**, *NSEA*, s. 40. See also, **RE-4**, Report of Peter Geddes, June 9, 2017, ¶ 9.

Project."[8] On the basis of this collective expertise, a panel reviews a proposed undertaking and provides recommendations to the Minister.

18. A review panel's advice is communicated through a panel report (referred to as the "environmental assessment report" under the *NSEA*[9]), which is addressed to the Minister and sets out the panel's findings on a proposed undertaking and its recommendations in light of these findings. In my experience a review panel bases its recommendations on the full range of evidence put before it during the review, including information provided by the proponent and government officials, and the questions, comments, and views expressed by members of the public.

19. While the style and format of a panel report is generally determined by the panel itself,[10] every report must satisfy certain basic requirements. In particular, as stipulated in s. 6.3 of the Joint Panel Agreement "[t]he Report shall…pursuant to Part IV of the Nova Scotia *Environment Act*, recommend either the approval, including mitigation measures, or rejection of the Project."[11] I discuss this requirement in greater detail in section III:E below.

B. Review Panels Predict and Evaluate the Environmental Effects of a Proposed Undertaking in Order to Advise the Decision-Maker

20. The *NSEA* defines "environmental assessment" as "a process by which the environmental effects of an undertaking are predicted and evaluated and a subsequent decision is made on the acceptability of the undertaking."[12] Review panels gather information in order to "predict and evaluate" an undertaking's environmental effects so that the Minister is appropriately informed before deciding on the acceptability of an undertaking in accordance with governing legislation. As I explain below, the provincial mandate of Nova Scotia review panels is broad. This reflects the wide-range of factors that must be considered under the *NSEA* and *NSEAR*. Moreover, a review panel's ability to fulfill its provincial mandate is largely dependent on the proponent

[8] **C-363**, Joint Panel Agreement, s. 3.3.

[9] **R-5**, *NSEA*, s. 3(t).

[10] See **R-599**, *Nova Scotia Environmental Assessment Board Regulations* O.I.C. 95-221 (Mar. 21, 1995), s. 34 (4).

[11] **C-363**, Joint Panel Agreement, s. 6.3.

[12] **R-5**, *NSEA*, s. 3(s).

being able to fulfill its role in providing adequate information and data regarding the proposed undertaking.

C. The Broad Mandate of Provincial Review Panels

21. The mandate of Nova Scotia review panels is governed by the provincial act and regulations. The *NSEA* and *NSEAR* are not prescriptive in terms of the specific scope or content of the review that must be conducted by a review panel. Rather, as evidenced by the following definitions of "environment" and "environmental effects", the Nova Scotia review process requires review panels to evaluate a wide range of potential biophysical and socio-economic effects:

> "**environment**" means the components of the earth and includes
>
> (i) air, land and water,
>
> (ii) the layers of the atmosphere,
>
> (iii) organic and inorganic matter and living organisms,
>
> (iv) interacting natural systems that include components referred to in subclauses (i) to (iii), and
>
> (v) for the purpose of Part IV, the socio-economic, environmental health, cultural and other items referred to in the definition of environmental effect;[13]
>
> "**environmental effect**" means, in respect of an undertaking,
>
> any change, whether negative or positive, that the undertaking may cause in the environment, including any effect on socio-economic conditions, on environmental health, physical and cultural heritage or on any structure, site or thing including those of historical, archaeological, paleontological or architectural significance, and
>
> any change to the undertaking that may be caused by the environment,
>
> whether the change occurs inside or outside the Province[.][14]

22. Panels evaluate the likelihood that an undertaking will cause "adverse effects" or "significant environmental effects."[15] An "adverse effect" is defined as "an effect that impairs or

[13] **R-5**, *NSEA*, s. 3(r); **R-6**, *Nova Scotia Environmental Assessment Regulations* O.I.C. 2003-67 (Feb. 28, 2003), s. 2 (j) ("*NSEAR*").

[14] **R-5**, *NSEA*, s. 3(v); **R-6**, *NSEAR*, s. 2(l).

damages the environment, including an adverse effect respecting the health of humans or the reasonable enjoyment of life or property,[16] while "significant" is defined to mean "with respect to an environmental effect, an adverse impact in the context of its magnitude, geographic extent, duration, frequency, degree of reversibility, possibility of occurrence or any combination of the foregoing."[17]

23. Collectively, these definitions make clear that while the potential "adverse effects" or "significant environmental effects" of an undertaking on the natural environment (soil, air, water, plants, animals, and their interactions) must be evaluated in a Nova Scotia EA, "adverse" or "significant" environmental effects on the socio-economic conditions of potentially affected communities are of equal importance.[18] My understanding is that the provincial requirement to consider socio-economic conditions is not disputed by the Claimants.[19]

24. Pursuant to the *NSEA*, socio-economic conditions can be assessed separately and independently from bio-physical impacts on the natural environment.[20] The provincial approach to considering "pure" socio-economic effects differs from the approach under *CEAA*, which is concerned with socio-economic effects that result directly from the project's effects on the natural environment (e.g. the loss of jobs in a commercial fishery resulting from damage to fish or fish habitat).

25. The exercise of evaluating socio-economic conditions can include a broad range of factors such as the potential impact of an undertaking on the local economy, the environmental health of humans, physical and cultural heritage, structures, sites or things of archaeological, paleontological or architectural significance, and the reasonable enjoyment of life and property. As such, Nova Scotia review panels can conclude that a proposed undertaking would potentially

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[15] **R-6**, *NSEAR*, s. 13(1).

[16] **R-5**, *NSEA*, s. 3(c); **R-6**, *NSEAR*, s. 2(c).

[17] **R-6**, *NSEAR*, s. 2(u).

[18] "Socio-economic" is not a defined term in federal or provincial EA legislation and in my experience a panel can simply rely upon the commonly-understood meaning of the term. For example, the Online Oxford English Dictionary defines the term "socio-economic" as "[r]elating to or concerned with the interaction of social and economic factors". See **R-600**, Oxford Dictionary Definition, "socio-economic".

[19] See for example, Reply Expert Report of David Estrin, December 18, 2012, ¶ 198: ("The Nova Scotia *Environment Act* refers to effects on 'socio-economic conditions'.")

[20] Affidavit of Chris Daly, December 6, 2011, ¶ 6.

result in an adverse effect or significant environmental effect solely on the basis of socio-economic effects.

26. While the consideration of socio-economic conditions in Nova Scotia's EA review process results in a broader inquiry at the provincial level in comparison to federal EA reviews, this approach is consistent with the stated goals of the *NSEA*, which recognizes "the linkage between economic and environmental issues,"[21] and "that long-term economic prosperity depends upon sound environmental management and that effective environmental protection depends on a strong economy."[22]

27. In the Whites Point project, the provincial requirement to consider socio-economic conditions is reflected in the Joint Panel Agreement, which specifically lists "the socio-economic effects of the project"[23] as a required factor to be considered in the scope of the review. Other factors that the JRP was required to consider relating to socio-economic conditions included "the location of the proposed undertaking and the nature and sensitivity of the surrounding area,"[24] "planned or existing land use in the area of the undertaking,"[25] "other undertakings in the area,"[26] and "comments from the public."[27]

28. Finally, in evaluating the predicted impacts of an undertaking and their severity, the consideration of proposed mitigation measures assists review panels in the determination of whether a specific environmental effect remains adverse or significant. With regards to undertakings, "mitigation" is defined by the *NSEAR* to mean "the elimination, reduction or control of the adverse effects or the significant environmental effects of the undertaking, and may include restitution for any damage to the environment caused by such effects through

[21] **R-5**, *NSEA*, s. 2(b).

[22] **R-5**, *NSEA*, s. 2(b)(vi).

[23] **C-363**, Joint Panel Agreement, Terms of Reference, Part III (i).

[24] **C-363**, Joint Panel Agreement, Terms of Reference, Part III (e).

[25] **C-363**, Joint Panel Agreement, Terms of Reference, Part III (f).

[26] **C-363**, Joint Panel Agreement, Terms of Reference, Part III (g).

[27] **C-363**, Joint Panel Agreement, Terms of Reference, Part III (k).

replacement, restoration, compensation or any other means."[28] The listing of mitigation measures in the review panel's recommendations is discussed further in section III:E below.

D. Importance of Information and Data Provided by the Proponent

29. The Nova Scotia EA process is predicated on an adequate information base to evaluate the potential effects of an undertaking. While review panels are charged with gathering the information necessary to evaluate and predict the environmental effects of an undertaking, they are heavily dependent on the proponent in this regard. Thus, in the Whites Point project's harmonized review, it was incumbent on the proponent to prepare an EIS that was responsive to the EIS Guidelines issued by the JRP.

30. In the provincial review panel process, the proponent's EIS is subject to a period of public review during which questions may be raised by any reviewer. If an EIS is found to have not furnished all of the information requested in the EIS Guidelines, then the Minister (or panel) may issue information requests to the proponent. In practice, the responses to these information requests will typically be required prior to start of the public hearing process. Further questions on the EIS may be posed by any participant during public hearings. These mechanisms are intended to ensure that the review panel has adequate information upon which to base its recommendations.

31. Where a proponent is unable to provide requested information, or is unresponsive or uncooperative in providing responses to information requests, this may be factored into the panel's recommendations to the Minister. For example, the members of a review panel often apply their own knowledge and experience to propose mitigation measures as conditions of approval, but in my opinion it is ultimately the responsibility of the proponent to propose such measures. In my experience, a review panel is not required to propose mitigation measures in cases where a proponent does not propose any, or proposes measures that the review panel judges to be insufficient.

32. Where a proponent provides inadequate information, a review panel may also be left unable to determine whether or not certain environmental effects may occur, whether or not they

[28] **R-6**, *NSEAR*, s. 2(r).

are adverse or significant, or whether they could be adequately mitigated. In this scenario, I am of the opinion that a panel would be within its mandate to recommend against the approval of a project if there are potential adverse effects or significant environmental effects that are uncertain and unacceptable.

E. Review Panels Make Recommendations to the Decision-Maker as to Whether a Proposed Project Should be Approved, With or Without Conditions, or Rejected

33. Nova Scotia review panels are ultimately charged with making one of three basic recommendations to the Minister: (1) to approve the undertaking, (2) to reject the undertaking, or (3) to approve the undertaking with conditions.[29] A panel is free to choose which of these three recommendations to make, but it must choose one. Moreover, the *NSEA* does not require a determination of "significance" to be made as a condition of the recommendation that a panel ultimately makes; a panel is free to provide the analysis and justification it deems necessary in support of its recommendations, as long as these fall within its mandate.

34. Each of the three EA review panels that I chaired in Nova Scotia were required to make one of these three recommendations specified in the *NSEA*. Past JRPs that have been established to carry out EAs in Nova Scotia have also been subject to this requirement. For example, the Joint Panel Agreement for the review of the Sydney Tar Ponds required the JRP Report to "include a recommendation pursuant to Part IV of the Nova Scotia *Environment Act*."[30] Similarly, in accordance with the requirements under Part IV of the *NSEA*, the Whites Point JRP was expressly required to "recommend either the approval, including mitigation measures, or rejection of the Project."[31]

35. Regarding the recommendation that must be made by a Nova Scotia review panel, the Claimants' environmental law expert, David Estrin, states that "it is standard practice in maritime Canada, and Nova Scotia in particular, for quarry and marine terminal environmental

[29] **R-5**, *NSEA*, s. 39(1). See also s. 43(1) which provides that recommendations must be made with respect to "the approval or rejection of an undertaking, or conditions that ought to be imposed upon an undertaking if it proceeds."

[30] **C-534**, *Joint Review Panel Environmental Assessment Report*, Sydney Tar Ponds Coke Oven Sites Remediation Project (Jul. 12, 2006), Appendix B, p. 158, s. 6.3.

[31] **C-363**, Joint Panel Agreement, s. 6.3.

assessments to be approved, and not be rejected."[32] He further argues that because there are prior comparable projects with similar environmental effects which underwent EA review, and because it is possible "to identify generic potential impacts of quarries and marine terminals and the mitigation measures" that could be applied to their approval, that it was "unequivocal practice" in Nova Scotia to approve such projects.[33] I do not agree with Mr. Estrin's statements.

36. In Nova Scotia there is no such thing as "standard" or "unequivocal" practice with regards to the outcome of an EA review. In theory, all projects that are referred to a review panel are "approvable." However, panels do not assume that projects will be approved or that the practice is to do so. Each project must be reviewed according to the provincial legislative requirements and on the basis of the merits of that project.

37. As explained above, the provincial review process is based on the panel's evaluation of whether the environmental effects of an undertaking will potentially result in "adverse effects" or "significant environmental effects."[34] Review panels do not base their recommendations on the recommendations or outcomes in regard to other projects. The fact that a project is approved does not guarantee that future projects will also be approved, or that a panel was incorrect to recommend the rejection of a past project. Accordingly, Mr. Estrin's approach of comparing the Whites Point project to other projects, such as the Black Point Quarry, is not determinative of what the outcome of the Whites Point EA would have been absent the NAFTA breach.

38. I also disagree with Mr. Estrin's statement that "[i]n practice, the typical effects were 'standard practice' and the mitigation measures usually prescribed for these projects were almost 'boiler plate.'"[35] Under the Nova Scotia EA regime, the environmental effects of similar types of projects may vary depending on the location, size, and nature of proposed activities, as well as other specific factors relating to the project and its surrounding area. Likewise, the degree of impact of certain environmental effects may also vary depending on the specific project. These factors could affect the panel's assessment of the adequacy of proposed mitigation measures. As such, the outcome of provincial EA reviews depends upon the specific context of each project.

[32] Expert Report of David Estrin, March 8, 2017 ("Estrin Report"), ¶ 7.

[33] Estrin Report, ¶ 130.

[34] See paragraph 22 above.

[35] Estrin Report, ¶ 37.

39. Notably, Mr. Estrin's comparison of the Whites Point project to other projects relies primarily on the information and conclusions presented in the Whites Point EIS.[36] An approach through which a review panel only considers an EIS would be inconsistent with the review panel's duty to consult with the public.[37] Unlike comprehensive study or screening report assessments, which are based primarily on the written materials submitted by the proponent, review panel EAs involves a much greater level of involvement than the other types of assessment.[38] In conducting an EA review, a review panel must consider not only the EIS, but all information presented during the review process, including formal submissions and presentations from government agencies, stakeholder groups, and the public. Comments, questions, and answers provided by all parties during the public hearings must also be considered. Through the public consultation process, it is possible that a review panel's conclusions regarding the environmental effects and proposed mitigation of a project may differ from the proponent's findings in its EIS.

40. Ultimately, if a review panel decides to recommend approval of a project, then the panel may or may not include recommendations on conditions which should apply to the project if it does proceed. Conditions typically relate to mitigation measures which should be adopted to prevent adverse effects or significant environmental effects, but may also relate to other matters, such as additional studies or information that is required, or additional liaison with surrounding communities. A panel will often rely on mitigation proposed by a proponent in its EIS or during the course of a review, but may also choose to recommend additional mitigation measures, whether these originate from the panel members or from hearing participants. However, as noted above, a review panel is not required to devise or to propose its own mitigation measures.

41. If a review panel's opinion is that an undertaking should be rejected, the *NSEA* does not require the panel to make any recommendation regarding mitigation or conditions. This is because the panel will have already considered that proposed mitigation measures are unable to

[36] Estrin Report, at Appendix D, "Comparison of Valued Environmental Components, Potential Environmental Effects and Residual Environmental Effects for 5 Comparator Projects."

[37] **C-363**, Joint Panel Agreement, s. 4.2: ("All Panel hearings shall be public and shall provide for public participation.")

[38] **R-5**, *NSEA*, s. 2(h): (Purpose of Act: "(h) providing access to information and facilitating effective public participation in the formulation of decisions affecting the environment…"); s. 43(b): (Duties of a Review Panel: "A review panel shall … (b) consult with the public in accordance with this Act); and 44: (Public Consultation).

reduce the project's environmental effects to an acceptable level. As such, in deciding to reject an undertaking, the panel will likely have addressed why certain mitigation measure(s) were inadequate, and the adverse effects or significant environmental effects were unacceptable, in the panel report.

IV. ANALYSIS OF WHITES POINT JRP'S RECOMMENDATIONS IN DISCHARGING ITS PROVINCIAL MANDATE HAD IT NOT COMMITTED THE NAFTA BREACH

A. Introduction

42. In this section of my Report, I provide my opinion as to the potential recommendations of the Whites Point JRP in discharging its mandate under Nova Scotia's EA regime, had it not committed the NAFTA breach.

43. Before doing so I note Mr. Estrin's conclusion that:

> *Prima facie*, the WPQ Project should have been approved because, as noted by this Arbitration Tribunal,
>
> > The [JRP] Report expressly identifies only one effect of the project as both significant and adverse, namely 'inconsistency with community core values'. With respect to other impacts of the project, the Panel allowed that "with the effective application of appropriate mitigation measures, competent project management and appropriate regulatory oversight, most project effects should not be judged 'significant'.[39]

According to Mr. Estrin, the project "was approvable, and would be approved, if standard federal Canada and Nova Scotia environmental assessment evaluation criteria and practices were fairly and objectively applied to the project."[40]

44. From my perspective as a review panellist in Nova Scotia, I do not agree with this conclusion. While a provincial review panel may conclude that a project will result in a "significant" or "adverse" environmental effect, the *NSEA* does not constrain a panel in making recommendations to the Minister on the basis of significance. As such, a finding of significance is not prerequisite for a recommendation to reject a project. While the JRP Report only identified inconsistency with community core values as being significant and adverse, it clearly had

[39] Estrin Report, ¶ 3.

[40] Estrin Report, ¶ 6.

concerns about the other environmental effects of the Whites Point project. As described in my analysis below, the JRP determined that the project would result in other adverse environmental effects. It also made other findings that, in my view, would not have supported a recommendation to approve the project.

45. Furthermore, I find Mr. Estrin's statement that "no federal or provincial government agency or official took the position before the JRP that the WPQ should not be approved or that after mitigation it would likely cause SAEE"[41] to be unpersuasive. My analysis below identifies several instances where the federal and provincial governments' submissions to the JRP identified issues regarding the project's environmental effects. As such, I do not think it is accurate to suggest that the federal and provincial governments were of the view that the project should be approved. Moreover, as explained above, the role of a Nova Scotia review panel is to provide a recommendation to the Minister with respect to whether to approve or reject a proposed project. In my experience, government submissions to a review panel typically address any predicted impacts that fall within the mandate of that department or agency but do not provide a recommendation on whether or not a project should be approved or rejected. This is because review panels consider the submissions of government departments and agencies, along with all other submissions and presentations made during the course of the EA process, in determining an appropriate recommendation. In this regard, Nova Scotia review panels function independently from the government in providing their recommendation to the Minister.

46. My analysis below is based on my review of the Whites Point JRP Report, as well as the EA record. Specifically, my approach was to review the Whites Point JRP Report and identify findings that were relevant to the provincial side of the JRP's mandate. For example, in several instances it made actual findings of adverse environmental effects. I then considered the information in the EA record relating to these issues in greater detail to determine whether the JRP's findings were reasonable and could have warranted a recommendation for rejection of the project (either on its own or in combination with other environmental effects).

47. I also considered the Whites Point JRP's concerns regarding the project's overall contribution to sustainable development, among other broader concerns regarding some of the

[41] Estrin Report, ¶ 49.

information provided by the proponent, and the public consultations it carried out. As explained below, these factors are important considerations, which were not supportive of a recommendation to approve the project.

48. My analysis does not conclusively determine the outcome of the review absent the NAFTA breach, as it would be impossible to fully re-construct the EA process and definitively determine what the review panel's specific conclusions and recommendations would have been. Nevertheless, in my view the findings I have identified below with respect to the project's environmental effects and the broader concerns would have been inconsistent with a recommendation for project approval. In the absence of the NAFTA breach, these findings, individually or collectively, could have reasonably resulted in a recommendation to the Nova Scotia Minister of Environment that the Whites Point project should be rejected.

B. Analysis of Environmental Effects Pursuant to Nova Scotia's EA Regime

49. As explained above, the provincial mandate of the JRP provides for the consideration of both bio-physical and socio-economic effects of the project. In this section, I consider some of the JRP's determinations that the project would result in adverse environmental effects, among other findings, that were in my view reasonably held in light of the public record. Based on my analysis, certain bio-physical effects, such as the project's impact on marine mammals, also raised concerns with respect to socio-economic effects. In my opinion, these findings, alone or in combination with one another, could have warranted a recommendation for rejection by the Whites Point JRP, absent the NAFTA breach.

1) *Bio-physical Effects*

50. The JRP identifies various concerns regarding the bio-physical effects of the project on both the marine and terrestrial environment. In my view, the most significant concerns relating to the marine environment concerned the impact of the project on endangered marine mammals, such as the North Atlantic right whale, and on species such as lobster. Additionally, the JRP raised concerns regarding the impact of the project on surface water, coastal wetland, and groundwater.

51. My analysis of the bio-physical effects of the project is not exhaustive. The impacts of the Whites Point project on endangered marine mammals and lobsters described below are but two

concerns which, in my view, could have reasonably resulted in the JRP concluding that the project would have adverse or significant environmental effects on the marine environment if it did not commit the NAFTA breach. There were numerous others. For example, the JRP found that "limited data about salmon responses to acoustic disturbance, along with the inability to adequately predict blasting impacts, result in a high degree of uncertainty about possible behavioural effects on this endangered population."[42] It also found "risks associated with ship docking over a significant portion of the year" that "[i]n the event of an accident … would result in an adverse environmental effect on the ecosystem and the local fishery", with direct adverse effects on fish species.[43] On their own, or together with the JRP's conclusions identified in this Report, these other conclusions were not supportive of project approval.

a) Marine Environment –Endangered Marine Mammals and Lobsters

52. The JRP's "Marine Effects Assessment" identified numerous concerns regarding interactions between the project and marine organisms.[44] For the purposes of this Report, I assess two of the JRP's concerns that appear to have been foremost in the JRP's mind – the potential impact of the project on (1) endangered marine mammals, and (2) lobsters.

53. As direct bio-physical effects of the project, the impacts on marine mammals and lobsters fit squarely within the scope of provincial interest and the mandate of environmental assessment under the *NSEA*. In the context of the Whites Point project, I also observe that the surrounding area of the project was particularly sensitive to these biophysical effects given the importance of these species to the local economy, which I consider in greater detail in section IV:B:2 below.

54. Regarding the potential impacts of the project on marine mammals, including endangered species such as the North Atlantic right whale, the JRP identified concerns with respect to the impacts of blasting.[45] The JRP noted that the effects of blasting on marine mammals were poorly

[42] **R-212**, *Environmental Assessment of the Whites Point Quarry and Marine Terminal Project, Joint Review Panel Report* (Oct. 2007) ("JRP Report"), p. 63.

[43] **R-212**, JRP Report, p. 80.

[44] **R-212**, JRP Report, pp. 50-66.

[45] **R-212**, JRP Report, p. 64.

understood and could range from mild annoyance and avoidance of the site, to changes in behaviour, to a sharp overpressure that could affect internal organs and result in slow or immediate death.[46] It was of the view that "direct physical harm and behavioural effects that could undermine survival rates of critically endangered species must be avoided."[47] In light of these concerns, the JRP concluded that the "direct physical harm and behavioural effects that could undermine survival rates of critically endangered species" and the "requirement for mitigative measures well beyond those proposed by the Proponent would qualify this as an adverse environmental effect."[48]

55. In its EIS, Bilcon highlighted the extensive protection and conservation efforts of species such as the North Atlantic right whale. It cited the Committee on the Status of Endangered Wildlife in Canada's ("COSEWIC's") status report on the North Atlantic right whale and the World Wildlife Fund and federal Department of Fisheries and Oceans' ("DFO's") "Canadian North Atlantic Right Whale Recovery Plan" in its EIS.[49] With regards to the special significance of the species, the COSEWIC status report stated that "[t]he North Atlantic right whale is an important subject of the whale-watching industry, especially in Canada's Bay of Fundy."[50] According to the Right Whale Recovery Plan, "[n]umbering only a few hundred individuals (300–350), this population is recognized as one of the most critically endangered populations of large mammals in the world."[51] Given the potential vulnerability of whales to catastrophic spills

[46] **R-212**, JRP Report, p. 64.

[47] **R-212**, JRP Report, p. 64.

[48] **R-212**, JRP Report, p. 64.

[49] See **R-579**, Whites Point Quarry & Marine Terminal, Environmental Impact Statement, Volume VI (Mar. 31, 2006) ("EIS – Volume VI"), Chapter 9.2.11, p. 118, referring to **R-591**, *COSEWIC assessment and update status report on the North Atlantic right whale Eubalaena glacialis in Canada*, Committee on the Status of Endangered Wildlife in Canada (2003) and p. 130, referring to **R-595**, The Right Whale Recovery Team, "Canadian North Atlantic Right Whale Recovery Plan", World Wildlife Fund Canada and the Department of Fisheries and Oceans (Sept. 2000).

[50] **R-591**, *COSEWIC assessment and update status report on the North Atlantic right whale Eubalaena glacialis in Canada*, Committee on the Status of Endangered Wildlife in Canada (2003), p. vi.

[51] **R-595**, The Right Whale Recovery Team, "Canadian North Atlantic Right Whale Recovery Plan", World Wildlife Fund Canada and the Department of Fisheries and Oceans (Sept. 2000), p. iii.

of oil and other toxic substances, "special attention should be given to areas where right whales are known to congregate annually to feed and nurse their young (e.g. lower Bay of Fundy)."[52]

56. To address such concerns over the potential impact of blasting, Bilcon stated in its EIS that it would use experienced observers to identify the possible presence of marine mammals within a safety radius as set out in the Blasting Protocol.[53] The Blasting Protocol states that Bilcon will "[e]mploy a trained observer equipped with 7 x 50 power pedestal mounted binoculars to ensure no explosive is detonated within 500 meters of any marine mammal."[54] Bilcon would also "[e]mploy a trained observer to ensure no explosive is detonated within 2,500 meters of any endangered marine mammal."[55] As described by Paul Buxton at a meeting of the Community Liaison Committee meeting in 2003, "there will be observers onshore with high-powered glasses to make sure that there are no seal, whale, or dolphin within a wide zone before any blasting goes off" [*sic*].[56]

57. It appears that government officials expressed concern over the effectiveness of Bilcon's proposed mitigation plan of using observers.[57] For example, in its presentation at the public hearing, DFO stated that it was "uncertain of the physical or behavioural impact of blasting on marine mammals within 500 meters of the blast site."[58] While DFO acknowledged that "the 500 and 2500 meter safety zones for marine mammals, is expected to reduce the potential for harmful impacts of blasting on marine mammals under good visibility conditions," it expressed concern

[52] **R-595**, The Right Whale Recovery Team, "Canadian North Atlantic Right Whale Recovery Plan", World Wildlife Fund Canada and the Department of Fisheries and Oceans (Sept. 2000), p. 14.

[53] **R-577**, Whites Point Quarry & Marine Terminal, Environmental Impact Statement, Volume IV (Mar. 31, 2006), Executive Summary Table C-1, item 12.4

[54] **R-576**, Whites Point Quarry & Marine Terminal, Environmental Impact Statement, Appendix Volume III ("EIS – Appendix Volume III"), Tab 9 - "Whites Point Quarry – Blasting Protocol" (May 2005), p. 3 (p. 84 of pdf).

[55] **R-576**, EIS – Appendix Volume III, Tab 9 - "Whites Point Quarry – Blasting Protocol" (May 2005), p. 3 (p. 84 of pdf)

[56] **R-601**, Minutes of Meeting of Community Liaison Committee (Jan. 9, 2003), p. 127, cited in Whites Point EIS Appendix 2.

[57] **R-463**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 4, Volume 4 (Jun. 20, 2007), p. 795:5-796:20.

[58] **R-498**, Fisheries and Oceans Canada, Presentation on the Whites Point Quarry and Marine Terminal Project ("DFO – JRP Presentation"), p. 10.

that "the ability to detect marine mammals at these distances in various weather conditions and sea states is uncertain."[59]

58. In addition to concerns regarding the impacts of blasting on marine mammals, DFO noted that "[a]ny additional shipping in the Bay of Fundy, increases the potential for collisions with marine mammals including right whales", and that "there is still some question as to how mitigation connected to shipping will be controlled by the proponent."[60] Furthermore, it stated that "[s]hip-induced noise has been identified as a potential limiting factor for right whales."[61]

59. Ultimately, the JRP concluded that "[q]uestions directed to DFO personnel and professional fishermen regarding the proposed observer function resulted in agreement that there was little confidence this mitigation process would achieve anything even remotely close to what the EIS promised."[62] The JRP further found that "given the critically endangered status of the North Atlantic right whale, the Panel believes that further mitigation measures should have been considered"[63] and that "the requirement for mitigative measures well beyond those proposed by the Proponent would qualify this as an adverse environmental effect."[64]

60. Based on the foregoing, I am of the view the Whites Point JRP's findings with respect to the project's effects on marine mammals were reasonable, and certainly within the realm of the conclusions that could have been drawn, given the importance of the Bay of Fundy as a habitat for right whales, the uncertainty over blasting impacts on the right whale and other marine mammal species, and the lack of demonstrably effective mitigation measures. In a case where an endangered species is at issue, and there are unknown effects and questions regarding the effectiveness of a proposed mitigation measure, I am of the view that the JRP's actual finding of an adverse environmental effect here could have also been characterized as significant under the

[59] **R-498**, DFO – JRP Presentation, p. 11.

[60] **R-498**, DFO – JRP Presentation, p. 13.

[61] **R-498**, DFO – JRP Presentation, p. 14; See also **R-602**, GPI Atlantic, Presentation to the Joint Review Panel for the Whites Point Quarry and Marine Terminal Project (Jun. 26, 2007), p. 4, which stated that "we don't know enough about how underwater noises will affect a right whale's physiology or its behaviour. Therefore, it is not possible to mitigate against impacts in the absence of reliable data on safe thresholds. Clearly the precautionary principle must be employed in this case so that this highly endangered species is properly protected."

[62] **R-212**, JRP Report, p. 64.

[63] **R-212**, JRP Report, p. 57.

[64] **R-212**, JRP Report, p. 64.

NSEA. This finding would not have been consistent with a recommendation to approve the project, and in my view this finding would have been made by the JRP regardless of its acts that breached NAFTA. As noted above, I also consider the project's impact on marine mammals to be a relevant factor in my assessment of socio-economic impacts relating to tourism in section IV:B:2(b) below.

61. Regarding the project's impacts on lobsters, the JRP identified a particular concern with the risk of introduction of invasive species from ballast water and hull fouling.[65] The JRP noted that a parasitic lobster disease in the waters off of New Jersey and New York "has contributed to the decimation of local lobster populations" and that while the "organism has not yet been seen as far north as the state of Maine … the risk from it, as well as other potentially ecosystem-disrupting organisms, is much too great for stakeholders to be anything but careful and vigilant."[66] Thus, the JRP concluded in its Report that the risk of invasive species was "a potential adverse environment effect."[67]

62. This concern stood in contrast to Bilcon's assessment of the project's potential impact on lobsters in its EIS, which generally considered the impacts on lobsters to be "negligible", "local", "long-term", and "insignificant negative."[68] To address the issue of invasive species in marine environments, the EIS did not appear to have proposed any direct mitigation measures.[69] Bilcon proposed to monitor ballast water discharge at the marine terminal, which was intended to provide early detection of possible invasive species.[70] However, in terms of avoiding the introduction of invasive species, the EIS noted that "the responsibility for ballast water management is with the shipping company, to either follow the current guidelines or comply with the pending regulations."[71] I note that Bilcon did undertake to "contract reputable shipping

[65] **R-212**, JRP Report, p. 59.

[66] **R-212**, JRP Report, p. 58.

[67] **R-212**, JRP Report, p. 59.

[68] **R-575**, Whites Point Quarry & Marine Terminal, Environmental Impact Statement, Volume I – Plain Language Summary (Mar. 31, 2006), pp. 13 and 29 ("EIS – Volume I"); **R-579**, EIS – Volume VI, Chapter 9.2.10, p. 116.

[69] **R-579**, EIS – Volume VI, Chapter 9.2.14, p. 136.

[70] **R-579**, EIS – Volume VI, Chapter 9.2.4.4, p. 96.

[71] **R-579**, EIS – Volume VI, Chapter 9.2.14, p. 135.

companies that are following prescribed guidelines and complying with any regulations regarding ballast water control and management."[72]

63. In response to Bilcon's proposed mitigation against the risk of invasive species, the JRP received a submission from DFO and the LFA (Lobster Fishing Area) 34 Management Board.[73]

64. In its presentation to the JRP, DFO acknowledged that adherence to the ballast water exchange regulations would "help reduce the risk of introductions," however it raised concerns that "eliminating or controlling the introduced species after it is detected can be difficult."[74]

65. The LFA 34 Management Board explained in its presentation to the JRP that "[i]nvasive Species and/or the introduction of bacteria that causes shell disease to crustaceans pose an unacceptably high risk to the lobster industry and to other commercial and recreational fisheries in the Bay of Fundy and beyond. These risks, if realized, would devastate the social, cultural and economic foundation and end a historical way of life in Southwest Nova Scotia."[75] In my opinion, this statement is of particular importance given that LFA 34 Management Board is made up of elected port representatives representing independent core lobster license holders who fish lobster in LFA 34.[76] The proponent did not appear to provide further information on how it would address the issues around invasive disease-causing organisms or mitigation measures in any of its subsequent submissions to the JRP.

66. The JRP appears to have concluded that the mitigation measure of ballast water exchange was problematic given that it still provided the opportunity for species invasion.[77] While the JRP noted that Bilcon's EIS proposed a regular monitoring program over the first five years of the project to identify newly introduced organisms, it was concerned that such a record-keeping measure would not effectively prevent against the risk of introduction of invasive species, which

[72] **R-579**, EIS – Volume VI, Chapter 9.2.14, p. 135.

[73] **R-603**, LFA 34 Management Board, Presentation to the Joint Review Panel, Whites Point Quarry and Marine Terminal Project (Jul. 12, 2007).

[74] **R-498**, DFO – JRP Presentation, p. 20.

[75] **R-603**, LFA 34 Management Board, Presentation to the Joint Review Panel, Whites Point Quarry and Marine Terminal Project (Jul. 12, 2007), p. ii.

[76] **C-109**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 10, Volume 10 (Jun. 27, 2007), p. 2242:7-2242:9.

[77] **R-212**, JRP Report, p. 9.

appears to have been its primary concern.[78] Thus the JRP believed that the project carried a reasonable risk of introducing unwanted diseases or invasive organisms into the Bay of Fundy.[79]

67. In light of the risk of negative impacts on a species considered to be of "considerable commercial importance,"[80] and the absence of mitigation measures that would prevent the risk, in my opinion it was legitimate for the JRP to conclude that the risk of parasitic lobster disease was a potential adverse environmental effect of the project.[81] In accordance with the views expressed by DFO, I am also of the opinion that while the proposed monitoring program might have been able to detect invasive organisms, Bilcon's proposed monitoring of ballast water discharges would not have provided an effective means to prevent introduction or to control such organisms once introduced. Thus, the concerns raised by the JRP would not have been sufficiently mitigated. While the JRP did not make an actual finding of an adverse environmental effect, such as in the case of blasting on endangered marine mammals, the JRP's finding of a potential adverse environmental effect here would have been reasonable and would not, in my view, have supported a recommendation to approve the project. I am also of the view that it is a finding the JRP would have made irrespective of the NAFTA breach. Further, I note that this was but one of the concerns that the JRP expressed over possible project effects on lobsters; for example, it also found that in light of the evidence before it the blasting activity on the quarry was likely to have an adverse environmental effect on lobster in the vicinity of the quarry site.[82] The impacts on lobster and other marine fish species are also relevant to my analysis of socio-economic effects related to fisheries in section IV:B:2(a) below.

b) Terrestrial Environment – Surface Water, Coastal Wetland, and Groundwater

68. The JRP Report identified concerns relating to potential impacts of the project on the terrestrial environment, including freshwater and groundwater resources. As a direct bio-physical effect, the project's impacts on surface water, coastal wetland, and groundwater are within the scope of provincial interest in an EA conducted under the *NSEA*. In this case, the JRP determined

[78] **R-212**, JRP Report, p. 59.

[79] **R-212**, JRP Report, p. 59.

[80] **R-212**, JRP Report, p. 62.

[81] **R-212**, JRP Report, p. 59.

[82] **R-212**, JRP Report, p. 66.

that the coastal wetland "would likely suffer adverse environmental effects"[83] and that the project would "adversely affect the groundwater regime."[84]

69. On surface water, the JRP noted that Bilcon presented varying scenarios of surface water management for the project.[85] Each proposal had its own set of associated problems and possible environmental effects. The JRP raised concerns about the ability of Bilcon's proposed diversion structures and sedimentation ponds to retain fine sediments and dissolved contaminants during extreme climatic events.[86] Accidents or malfunctions in the diversion structures and sedimentation ponds could result in the release of sediments and flocculants into the Bay of Fundy.[87]

70. On coastal wetland, the JRP appears to have doubted the long-term sustainability of the proposed plant and animal communities in the constructed wetlands due to the "likelihood of high-volume, high flow-rate emergency water releases during storm events."[88] The JRP concluded that "the constructed wetland would not function effectively as a mitigation measure to protect the quality of effluent released from the ponds."[89] The JRP noted that "[w]hen portions of ANFO [(ammonium nitrate fuel oil mixture)] end up in fragmented rock, through spillage or incomplete detonation, ammonium and nitrates can leach out into the surface water or seep into the groundwater."[90] As a result of blockages to seasonal water flow to a coastal freshwater wetland located on the project site, the JRP also determined "that the coastal fen would likely suffer adverse environmental effects."[91] Moreover, the JRP Report noted uncertainties over the project's impact on wetland. Despite requests for sampling data and paleoecological data to

[83] **R-212**, JRP Report, p. 7.

[84] **R-212**, JRP Report, p. 39.

[85] **R-212**, JRP Report, p. 33.

[86] **R-212**, JRP Report, p. 33.

[87] **R-212**, JRP Report, p. 34.

[88] **R-212**, JRP Report, p. 7.

[89] **R-212**, JRP Report, p. 36.

[90] **R-212**, JRP Report, p. 6.

[91] **R-212**, JRP Report, p. 7.

clarify the scientific and ecological value of the wetland,[92] it does not appear that the proponent provided such data in response to any of the information requests.

71. On groundwater, the JRP raised concerns about the supply of groundwater and the limited hydrogeological data presented by the proponent.[93] The panel noted that uncertainties existed regarding possible impacts of quarry activities on the local groundwater.[94] Moreover, the JRP noted that Bilcon failed to outline any mitigative measures that could be implemented to prevent or alleviate domestic water supply problems prior to compensation.[95] The panel concluded that quarry activities would adversely affect the groundwater regime.[96] It was highly probable that quarrying would intersect the water table, given the fractured nature of the basalts on the site.[97]

72. Bilcon had predicted in the EIS that the project's impacts on surface and groundwater would be "local", "long-term", and "neutral."[98] Bilcon planned to conduct pre-blast surveys of neighbouring wells, and to install monitoring wells to monitor groundwater levels.[99] Bilcon's assessment was that "the Whites Point quarry will not adversely impact the quantity or quality of the groundwater supply or the local wells" and that blasting will not impact the groundwater supply.[100] It also submitted that "the quarry site possesses no significant wetlands."[101]

73. According to the EIS, "[n]atural surface runoff from the mountain side will be interrupted near the quarry face and diverted at this point into controlled drainage ways and into

[92] **R-212**, JRP Report, p. 35.

[93] **R-212**, JRP Report, p. 38. As noted by the JRP, Natural Resources Canada ("NRCan") and Nova Scotia Department of Environment and Labour ("NSDEL") experts stressed that "the Proponents' monitoring wells were not appropriate for characterizing this type of aquifer and could not test for the presence of multiple water levels. The existing monitoring wells are not suitable to measure parameters such as transmissivity or hydraulic conductivity that are required to estimate the amount of groundwater flow" (p. 39).

[94] **R-212**, JRP Report, p. 39.

[95] **R-212**, JRP Report, p. 39.

[96] **R-212**, JRP Report, p. 39.

[97] **R-212**, JRP Report, p. 39.

[98] **R-575**, EIS – Volume I, p. 11.

[99] **R-575**, EIS – Volume I, p. 17.

[100] **R-579**, EIS – Volume VI, Chapter 9.1.3, p. 27.

[101] **R-581**, Whites Point Quarry & Marine Terminal, Revised Project Description (Nov. 1, 2006), p. 10.

the environmental control areas such as sediment retention ponds and constructed wetlands."[102] Moreover,

> Maintaining the appropriate surface water flow into the coastal bog preservation area will be accomplished by diverting runoff from the quarry floor to the sediment retention ponds, through a constructed wetland, and then to the head of the bog. This bog has functioned as a natural filter for upland surface water runoff for years. Thus, the objective is to maintain this natural filtering system for runoff before entering the marine environments of the Bay. All water from the working area of the quarry will enter the sediment retention ponds before flowing into the bog area or being discharged into the constructed wetland and then into the Bay.[103]

However, as noted in the proponent's Suspended Solids Survey, "whether or not the sedimentation pond is operating efficiently enough to satisfy current CCME suspended sediment guidelines is a bit more difficult to evaluate."[104]

74. During the hearing, Natural Resources Canada ("NRCan") highlighted uncertainties over the potential impact of the project on groundwater flow under natural conditions and during quarry operations.[105] Additionally, NRCan raised concerns over the adequacy of Bilcon's groundwater modelling, monitoring, and predictions. According to Dr. Miroslav Nastev, a research scientist for NRCan, the methodology used by the proponent to measure groundwater flows was not appropriate given that there is "no one water level" in a fractured aquifer.[106] Due to the complexity of measuring groundwater flows in this setting, a comprehensive field study would be required to gain advanced knowledge of the potential impacts.[107]

75. Furthermore, NRCan submitted that field data did not support Bilcon's expected impacts of the quarry.[108] Bilcon's interpretation that the impact would be very low or negligible was just

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[102] **R-579**, EIS – Volume VI, Chapter 9.1.6.3, p. 47.

[103] **R-579**, EIS – Volume VI, Chapter 9.1.6.3, p. 48.

[104] **C-391**, Michael Brynlinksky, *Results of a Suspended Solid Survey at the Whites Point Quarry* (Jun. 2003), EIS Reference Documents Volume 2, Section 12, p. 9.

[105] **R-604**, Natural Resources Canada, Whites Point Quarry and Marine Terminal Project, Presentation to the Joint Review Panel (Jun. 22, 2007), slide 10.

[106] **C-159**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 6, Volume 6 (Jun. 22, 2007) ("JRP Hearing Transcript – Day 6"), p. 1216:19-1224:19.

[107] **C-159**, JRP Hearing Transcript – Day 6, p. 1230:24-1231:1.

[108] **C-159**, JRP Hearing Transcript – Day 6, p. 1226-7.

one interpretation of the data.[109] According to NRCan, there were "many other interpretations of the water levels."[110] Nevertheless NRCan was certain that "the quarry base will be very close, maybe in the groundwater level. So the groundwater most probably will discharge from the vertical or from the horizontal fracture that will be eventually intercepted by the proposed quarry."[111] As such, NRCan was of the view that the quarry operations would impact the groundwater recharge, the groundwater levels, the well yields, the discharge, the groundwater discharge, and possibly the groundwater quality.[112]

76. Similarly, the Nova Scotia Department of Environment and Labour ("NSDEL") highlighted the uncertainties surrounding the impact of the project on groundwater. NSDEL stated that clarification was needed on the proposed depth of the quarry.[113] NSDEL noted that it required a quantitative assessment to assess the potential drawdown effects at off-site water wells if the quarry extends below the water table.[114] Additional data and monitoring wells would be required.[115]

77. NDSEL also identified two main potential impacts on drinking water. First, groundwater levels could decline, which may affect nearly water wells. Second, blasting could cause yield changes and temporary siltation at nearby water wells.[116]

78. In reaching its conclusions, the JRP considered many of the above concerns. Specifically, the JRP Report noted that "NRCan's and NSDEL's hydrogeologists predicted that the quarry would almost certainly intersect the water table, and would act as a giant pump that could eventually displace the groundwater divide as well as the lower water levels and yields in the

[109] **C-159**, JRP Hearing Transcript – Day 6, p. 1225:18-21, p. 1227:8-10.

[110] **C-159**, JRP Hearing Transcript – Day 6, p. 1225:20-21.

[111] **C-159**, JRP Hearing Transcript – Day 6, p. 1228:2-6.

[112] **C-159**, JRP Hearing Transcript – Day 6, p. 1226-7; **R-604**, Natural Resources Canada, Whites Point Quarry and Marine Terminal Project, Presentation to the Joint Review Panel (Jun. 22, 2007), slide 7.

[113] **R-605**, Nova Scotia Department of Environment and Labour, Comments on the Proponent's Environmental Impact Statement (Aug. 3, 2006), p. 6 ("NSDEL – Comments on EIS").

[114] **R-605**, NSDEL – Comments on EIS, p. 6.

[115] **R-606**, Nova Scotia Environment & Labour, Hydrogeology Presentation to the Whites Point Quarry Joint Review Panel (Jun. 22, 2007), slide 7.

[116] **R-606**, Nova Scotia Environment & Labour, Hydrogeology Presentation to the Whites Point Quarry Joint Review Panel (Jun. 22, 2007), slide 8.

surrounding area."[117] Moreover, the JRP explained that "NRCan's and NSDEL's experts stressed that the Proponent's monitoring wells were not appropriate for characterizing this type of aquifer and could not test for the presence of multiple water levels."[118] The JRP concluded that "[g]iven the fractured nature of the basalts on the site, it is highly probable that quarrying would intersect the water table. Dewatering at the quarry face would continue until a stable equilibrium (lowered water table) was reached or some yet to be specified mitigative action stopped the process."[119]

79. The extensive uncertainty regarding how the project would impact groundwater quantity and domestic drinking water wells in the surrounding area raises, in my mind, legitimate concerns about the project's effects on local residents and their ability to sustain an adequate drinking water supply. In the absence of reliable baseline information, it is possible that the impacts could have been more significant than what the proponent appears to have predicted. While the JRP could have recommended that the proponent conduct the comprehensive field study or quantitative assessment suggested by NRCan and NSDEL as conditions of an approval, it would have needed to determine the appropriate scope, content, extent (physical and temporal), and methodology for such studies. In my view, this would have been a complex undertaking for the JRP, and may have been difficult based on the limited available information. Faced with these uncertainties, it was reasonable for the review panel to conclude that the project would have an adverse environmental effect on both the coastal wetland and on groundwater. In my view, these findings would not have changed in the absence of the NAFTA breach. Although the JRP did not conclude that the project would have an adverse environmental effect on surface water, in my opinion the concerns it identified over the release of sediments arose irrespective of the JRP's acts that breached NAFTA. The JRP's findings on surface water, coastal wetland, and groundwater, alone or in combination with the other findings in this Report, would not have been supportive of a recommendation of project approval.

[117] **R-212**, JRP Report, p. 7.

[118] **R-212**, JRP Report, p. 39.

[119] **R-212**, JRP Report, p. 39.

2) *Socio-Economic Effects*

80. As explained above, socio-economic conditions are explicitly referred to in the *NSEA*'s definition of "environmental effect" and must be considered as part of the Nova Scotia EA process.[120] In the context of the Whites Point EA, the Joint Panel Agreement and Terms of Reference expressly listed "the location of the proposed undertaking and the nature and sensitivity of the surrounding area," "planned or existing land use in the area of the undertaking," and "socio-economic effects of the Project" as required factors to be taken into account in the joint review process.[121] Similarly, the EIS Guidelines provided that the *NSEA* defines "adverse effect" to mean "an effect that impairs or damages the environment, including an adverse effect respecting the health of humans or the reasonable enjoyment of life or property."[122]

81. The JRP Report identified numerous adverse socio-economic effects arising from changes to the environment caused by the project. In my view, the most significant socio-economic concerns that were identified related to local fisheries, tourism, and reasonable enjoyment of life and property.[123] These concerns became apparent during the public comment and public hearing stages of the process. As noted above, many of the fisheries and tourism socio-economic impacts resulted directly from the bio-physical impacts of the project, as did some of the issues relating to enjoyment of life or property.

a) Fisheries

82. The JRP concluded that the project would likely have an "adverse environmental effect on the socio-economic health and viability of some of the fishing communities of Digby Neck and Islands" noting that "[t]he range of the effect on the fishery would have environmental repercussions that extend throughout Lobster Fishing Area 34."[124] In particular, the JRP found

[120] **R-5**, *NSEA*, ss. 2(a), 3(r)(v).

[121] **C-363**, Joint Panel Agreement, Terms of Reference, Part III (e), (f) and (i).

[122] **R-210**, *Environmental Impact Statement Guidelines for the Review of the Whites Point Quarry and Marine Terminal Project* (Mar. 2005), p. 7 ("EIS Guidelines").

[123] **R-212**, JRP Report, Section 2.5, pp. 83-85 (In particular, in Table 2-1 "Summary of Panel concerns from terrestrial, marine and human effects assessment", the JRP stated "For some project effects, the Project is likely to adversely affect the reasonable enjoyment of life or property for those in the vicinity of the Project", relating to "Loss of community's peaceful enjoyment", and impacting "Nearby fishing communities (LFA 34)").

[124] **R-212**, JRP Report, p. 77.

that "[a]ny risk to the lobster stock that may come with invasive species could affect the fishery throughout the Bay of Fundy."[125]

83. In its EIS, Bilcon described the fishery as follows:

> Without question, the fishery represents a mainstay of the economy on Digby Neck/Islands. Although the fishery is not as dominant as it once was, it still accounts for the largest source of employment and income for fish harvesters and fish processing workers. The most lucrative sector is the lobster fishery.[126]

84. Overall, the EIS considered the project to have a "long term, insignificant negative effect, of regional scale" on the nearshore fishery.[127] An anticipated effect on lobster fishing was the disruption to lobster trap buoys from vessels approaching and departing the terminal through a traditional lobster fishing area.[128] Bilcon estimated that the possible disruption would occur 24 days during the six month lobster season.[129]

85. According to DFO "[t]he single most highly valued LFA in Atlantic Canada is LFA 34 ($252 million in 2004-2005)."[130] Chris Hudson, President of the Bay of Fundy and Shore Fisherman's Association and the Co-Chair of the Fundy Fixed Gear Council, explained the potential impact of the bio-physical effects of the project on those dependent on the fishing industry:

> As fishermen, our livelihood depends on the fragile ecosystem and the Bay of Fundy being kept healthy, and we want to protect and maintain it so it continues to be a source of jobs and a way of life far into the future.[131]

86. To mitigate the potential disruption of lobster buoys, lines, and traps and of herring nets in nearshore waters, Bilcon proposed for specific ship lanes to be designated.[132] The EIS further

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[125] **R-212**, JRP Report, p. 77.

[126] **R-580**, Whites Point Quarry & Marine Terminal, Environmental Impact Statement, Volume VII (Mar. 31, 2006), Chapter 9.3.10, p. 85 ("EIS – Volume VII").

[127] **R-580**, EIS – Volume VII, Chapter 9.3.13.4, p. 96.

[128] **R-580**, EIS – Volume VII, Chapter 9.3.13.2, p. 95.

[129] **R-580**, EIS – Volume VII, Chapter 9.3.13.2, p. 95.

[130] **R-212**, JRP Report, pp. 11 and 76, and **R-607**, Department of Fisheries and Oceans Canada, Science Branch, Undertaking #30 for Whites Point Quarry Panel Review (Jun. 29, 2007).

[131] **C-161**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 8, Volume 8 (Jun. 25, 2007), ("JRP Transcript – Day 8"), p. 1875:5-9.

stated that consultation meetings were held with lobster fisherman and that an area for ship approach/departure would be determined in consultation with local lobstermen.[133] Upon request, advance notice of shipment schedules would be provided to fishers who traditionally fish the nearshore waters.[134] Discussions were ongoing on a lobster trap fund that Bilcon would establish and allow local lobster fisherman to administer, in order to compensate for lost traps and related gear from shipping activities.[135] Bilcon also proposed to monitor the project's impacts on the fishery by keeping shipment records of the frequency and duration of vessels throughout the year.[136] Despite these statements in the EIS, the JRP appears to have found that representatives of certain fishing organizations had not been consulted by the proponent. While the EIS stated that "an agreement had been reached with the lobster fishers of Whites Cove with respect to potential damage to gear,"[137] no agreement appears to have been reached. This led the JRP to question – quite reasonably in my opinion – the accuracy and reliability of the evidence provided in the EIS.[138]

87. The JRP also questioned the effectiveness of the mitigation measures proposed by the proponent. In particular, the JRP predicted that the call-in line to advise fishers of when ships were scheduled to arrive at the terminal was not technically feasible, given the nature of fishing activities.[139] The JRP's views appear to have been supported by the submissions of the LFA 34 Management Board, which raised concerns regarding the displacement of fish harvesters by the project. The LFA 34 Management Board stated that it "would not be feasible for lobstermen to have to move their traps once every two weeks before Bilcon set off their blasts and then move the traps back onto the fishing grounds."[140] If fog or bad weather required a blast to be delayed, fishermen might miss multiple days of valuable fishing. Moreover, getting gear back onto fishing

[132] **R-580**, EIS – Volume VII, Chapter 9.3.13.3, p. 95.

[133] **R-580**, EIS – Volume VII, Chapter 9.3.13.3, p. 95.

[134] **R-580**, EIS – Volume VII, Chapter 9.3.13.3, p. 95.

[135] **R-580**, EIS – Volume VII, Chapter 9.3.13.3, p. 95.

[136] **R-580**, EIS – Volume VII, Chapter 9.3.13.4, p. 96.

[137] **R-580**, EIS – Volume VII, Chapter 9.3.9.1.1, p. 73.

[138] **R-212**, JRP Report, p. 76.

[139] **R-212**, JRP Report, p. 76.

[140] **R-275**, LFA 34 Management Board, Presentation to the Joint Review Panel, Whites Point Quarry and Marine Terminal Project (Jun. 27, 2007), p. 6.

grounds would add to the fishermen's cost of fuel and labour. Lower incomes and higher costs could displace fish harvesters from their traditional fishing grounds.[141] The Fundy Fixed Gear Council also submitted that the project could result in the loss of traps and valuable fishing days, while the proposed mitigation measures did not provide specificity on the supposed trap fund or for emergency procedures.[142]

88. The LFA 34 Management Board also raised legitimate concerns over the impact of invasive species. Based on DFO's comments that it would be difficult to eliminate or control invasive species after entering the area, the LFA 34 Management Board considered the risk of invasive species to be extremely high as a result of vessel transportation of aggregate. From a socio-economic perspective, the resulting impact of lobster disease could cause the loss of thousands of jobs.[143] These concerns were echoed by Mr. Hudson of the Fundy Fixed Gear Council, who testified that over 1,000 lobster fishing licences operated within the two neighbouring districts.[144] In his appraisal, "[t]he number of people affected for 100 licences, one tenth of the total, is at the minimum of 300 fishermen. This does not include the buyers, truckers, processors, packagers and retail commercial sectors."[145] By comparison, the Whites Point project would only lead to the creation 34 full-time long-term jobs.[146]

89. In my opinion, based on the submissions presented by representatives of the local fishing community and the questions that arose over the proponent's proposed mitigation measures, the JRP's conclusion that the socio-economic health and viability of the industry and communities dependant on it would likely be adversely affected by the project[147] was well within the scope of reasonable decisions that could be made on this particular socio-economic effect, and was a conclusion that would not have changed absent the NAFTA breach.

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[141] **R-275**, LFA 34 Management Board, Presentation to the Joint Review Panel, Whites Point Quarry and Marine Terminal Project (Jun. 27, 2007), p. 6.

[142] **C-161**, JRP Transcript – Day 8, pp. 1878:19-1882:2.

[143] **R-275**, LFA 34 Management Board, Presentation to the Joint Review Panel, Whites Point Quarry and Marine Terminal Project (Jun. 27, 2007), p. 6.

[144] **C-161**, JRP Transcript – Day 8, p. 1882:3-1887:7.

[145] **C-161**, JRP Transcript – Day 8, p. 1884:10-13.

[146] **R-581**, Whites Point Quarry & Marine Terminal, Revised Project Description (Nov. 1, 2006), Chapter 7.8, p. 96.

[147] **R-212**, JRP Report, p. 77.

b) Tourism

90. The location of the proposed Whites Point project was in a popular tourist region. The JRP Report observed that "[i]n recent decades the tourism industry has become an increasingly important component of the local economy."[148] With regards to the project's impacts on the tourism industry, the JRP noted that "[a]ny activities that might frighten whales away from the coast could undermine the regional tourism economy."[149]

91. In its EIS, Bilcon concluded that the impacts of the project on the Digby Neck and Islands tourism industry would be "long term, insignificant negative effect, of regional scale."[150] In this regard, the EIS described the Digby Neck and Islands tourism industry as "primarily natural resource based including land, coastal, and marine attractions."[151] The EIS also noted that whale watching is considered the number one tourism activity in area.[152] However, aside from identifying issues relating to the visibility of the quarry and marine terminal from tour boats, the proponent does not appear to have identified any other socio-economic concerns relating to tourism.[153]

92. In contrast, the Community/Business Consultation Report, commissioned by the proponent for the purposes of its EIS, noted that in many cases, residents were concerned that the project would destroy tourism and their way of life.[154]

93. At the hearing, the Nova Scotia Tourism Culture and Heritage Department raised similar concerns.[155] In particular, Darlene MacDonald, a representative from the department stated that "[w]ith increased shipping, there is potential that it may impact the already endangered species, which could, in turn, impact the local whale-watching sightseeing tours and businesses."[156] The

[148] **R-212**, JRP Report, p. 77.

[149] **R-212**, JRP Report, p. 77.

[150] **R-580**, EIS – Volume VII, Chapter 9.3.14.5, p. 105.

[151] **R-580**, EIS – Volume VII, Chapter 9.3.14.1, p. 97.

[152] **R-580**, EIS – Volume VII, Chapter 9.3.14.1, p. 99.

[153] **R-580**, EIS – Volume VII, Chapter 9.3.14, pp. 97-105.

[154] **C-601**, Whites Point Quarry and Marine Terminal, Community/Business Consultation Report by Elgin Consulting and Research (Aug. 2005), p. 18 (EIS Reference Document 21).

[155] **C-161**, JRP Transcript – Day 8, pp. 1737:16-1744:25.

[156] **C-161**, JRP Transcript – Day 8, p. 1740:6-9.

department was concerned that the project had the potential to negatively impact the provincial tourism brand, since it was not consistent with Nova Scotia's international tourism promotions.[157] Another related concern was that the increased noise from operation and shipping could impact whales and create a risk for sightseeing tour operations.[158]

94. From an economic perspective, the department explained that tourism revenues in Digby County were $37.7 million in 2006, according to preliminary results.[159] In its presentation at the hearing, the department also noted that 44% of pleasure travelers participated in nature observation activities during visits to Nova Scotia.[160]

95. Similarly, in its written submission to the JRP, the Nova Scotia Chapter of the Canadian Parks and Wilderness Society ("CPAWS") described the local region as "a popular tourist destination because of its relatively pristine natural beauty and its traditional way of life."[161] Accordingly, CPAWS maintained that "[t]he development of a large quarry and marine terminal is at odds with both of these characterizations, and can detract from potential visitors' ideas of what this area is like."[162] Moreover, the Tourism Industry Association of Nova Scotia explained that the impact of blasting and shipping on whales in the area was a serious threat to not only the whales themselves but also to the tourism industry."[163] At the hearing, the association remained concerned about the full effect of blasting activities. It held that more rigorous methods of assuring the safety of marine mammals were required, as "[o]ne land base observer is not sufficient to scan the horizon for whales prior to blasting and whales can move at great speeds and may arrive within the area during the period of blasting or may surface and be struck by ships in the area during transportation of the basalt."[164]

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[157] **C-161**, JRP Transcript – Day 8, p. 1743:20-24.

[158] **C-161**, JRP Transcript – Day 8, p. 1743:25-1744:23.

[159] **R-594**, Nova Scotia Tourism, Culture and Heritage, Presentation to Joint Review Panel (Jun. 25, 2007), slide 12.

[160] **R-594**, Nova Scotia Tourism, Culture and Heritage, Presentation to Joint Review Panel (Jun. 25, 2007), slide 16.

[161] **R-592**, Canadian Parks and Wilderness Society, Nova Scotia Chapter (CPAWS-NS), Review of the Whites Point Quarry and Marine Terminal Environmental Impact Statement (Aug. 11, 2006), ("CPAWS – Review of EIS"), p. 20.

[162] **R-592**, CPAWS – Review of EIS, p. 20.

[163] **R-608**, Tourism Industry Association of Nova Scotia (TIANS), Submission to the Review Panel on EIS (Aug. 10, 2006), p. 2 ("TIANS – Written Submission").

[164] **R-608**, TIANS Written Submission, p. 2.

96. In my view, the potential disturbance to marine mammals – particularly to the endangered right whale – could have reduced marine mammal populations and their use of the waters near the project. These bio-physical effects could have negatively impacted tourism by undercutting Nova Scotia's brand as a destination for eco-tourism activities such as whale-watching. The visual and aesthetic impacts of a large quarry operation could have also negatively impacted tourism, jobs, and income through the loss of the reputation of Digby Neck as a picturesque tourism destination. Collectively, these impacts could have had a long-term effect on the local tourism industry. While the JRP did not expressly find that these impacts were adverse environmental effects, in my view they went to the heart of the concerns over the project and would at the very least not have supported a recommendation for approval of the project, regardless of the acts in breach of NAFTA.

c) Reasonable Enjoyment of Life and Property

97. The definition of "adverse effect" in the *NSEA* included "the reasonable enjoyment of life and property."[165] The JRP determined that windborne particles created a serious risk of adverse environmental effects on human receptors.[166] The panel also held that "[n]oise, dust, light and traffic would disrupt the life residents have come to know and love in the Digby Neck and Islands."[167] According to the JRP, this change could constitute an adverse environmental effect.[168] Similarly, the panel found that the risk of loss of groundwater was "an adverse environmental effect that would continue long after the project concluded."[169]

98. In its EIS, Bilcon predicted that the impacts of the project on air quality, noise, and vibration would be local, long-term, and insignificant or negative.[170] Impacts on drinking water quality were considered to be local, long-term, and neutral or insignificant negative.[171] Similarly, the Human Health and Community Wellness Assessment submitted in Bilcon's EIS predicted

[165] **R-5**, *NSEA*, s. 3 ("(c) "adverse effect" means an effect that impairs or damages the environment, including an adverse effect respecting the health of humans or the reasonable enjoyment of life or property").

[166] **R-212**, JRP Report, p. 73.

[167] **R-212**, JRP Report, p. 74.

[168] **R-212**, JRP Report, p. 74.

[169] **R-212**, JRP Report, p. 74.

[170] **R-575**, EIS – Volume I, Table 2, p. 15.

[171] **R-575**, EIS – Volume I, Table 2, p. 15.

that "the Project construction and operations activities will not have a significant adverse effect on human health and community wellness."[172] To mitigate air quality and noise effects, the proponent stated that it would comply with established regulatory thresholds for dust, noise, contaminants, and air quality.[173]

99. However, the EIS concluded that the project would have an adverse effect on "some individuals' quality of life because of various level[s] of tolerance to disturbance, especially those living adjacent to the quarry and Digby Neck residents."[174] Bilcon also stated that it "recognized that there has been a disruption of the community's social cohesion during the pre-project planning phase of the project and during the environmental assessment / Panel Review phase as individuals with different objectives have interacted and discussed the potential effects of the project."[175] Thus, although predicting "no significant adverse environmental effects," the proponent recognized that the project had already had a social impact at the planning and assessment phase.

100. At the public hearing, numerous local residents expressed concerns with respect to the effects of quarrying activities, such as blasting and increased traffic, on the local water supply, air quality, and noise pollution.[176] Similar concerns regarding the impacts of blasting, ballast water, and water contamination were also conveyed by elected officials representing the Municipality of Digby and Town of Annapolis Royal.[177] As explained by James Thurber, Warden for the Municipality of the District of Digby, "Council's concerns about the uncertainties as to the potential negative effects of this project lead us to support our citizens who

[172] **C-431**, *Human Health and Community Wellness Assessment for the Whites Point Quarry and Marine Terminal Environmental Impact Statement*, Submitted by AMEC Earth & Environmental (Jan. 13, 2006), s. 6.4.2.1, p. 55 (EIS Reference Document #34).

[173] **R-575**, EIS – Volume I, Chapters 7.11 and 7.12, pp. 40-41; See also, **C-431**, *Human Health and Community Wellness Assessment for the Whites Point Quarry and Marine Terminal Environmental Impact Statement*, Submitted by AMEC Earth & Environmental (Jan. 13, 2006), s. 6.4.2.1, p. 55 (EIS Reference Document #34).

[174] **C-431**, *Human Health and Community Wellness Assessment for the Whites Point Quarry and Marine Terminal Environmental Impact Statement*, Submitted by AMEC Earth & Environmental (Jan. 13, 2006), s. 6.3.7, p. 53 (EIS Reference Document #34).

[175] **R-575**, EIS – Volume I, Chapter 7.11, p. 40.

[176] See for example, **R-609**, Michelle Bull, Comments on Whites Point Quarry Proposal (Jun. 20, 2007); **R-610**, Klaus Langpohl, Submission to the Panel Hearing on the Proposed Mega Quarry and Marine Terminal at Whites Point, Nova Scotia (Jun. 28, 2007); **R-611**, Lois Oliver, Submission to the JRP (Jul. 11, 2007).

[177] **R-612**, Letter from Jim Thurber, Warden of Municipality of Digby to Debra Myles, CEAA (July 25, 2006); and **R-613**, John Kinsella, Mayor of Annapolis Royal, Comments on EIS (Aug. 4, 2006).

do not wish to see this proceed."[178] Local residents also considered the development of a quarry and marine terminal to be a threat to local residents' quality of life.[179]

101. During the assessment, various participants noted that planning documents for the local communities emphasized traditional industries such as fishing and tourism. They did not contemplate large-scale resource extraction as a desirable industrial development for the area. For example, the Digby Neck Community Development Association's comments in response to the Whites Point Quarry EIS countered that "in more [than] fifteen years of strategic planning and community economic development (CED) visioning, not once did the residents of this community say that the future they wanted for the Digby Neck should include massive industrial extraction of minerals."[180] In its written submission, CPAWS also stressed the ecological value of the entire Digby Neck and Islands region, stating that "[t]he presence of a 150-hectare quarry and deep water marine terminal could decrease the conservation value of the area and the desirability of pursuing it as an [National Marine Conservation Area]."[181] Such a designation would not only be important from a conservation standpoint, but provide for increased tourism, recreation, education, economic, scientific, and cultural opportunities.[182]

102. As noted by the JRP, Health Canada submitted that if effects predictions were correct and the mitigation measures proposed were effective, the project was unlikely to have an adverse effect on human health.[183] However, at the hearing there was evidence that several components

[178] **C-161**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 8, Volume 8 (Jun. 25, 2007), p. 1777:15-18.

[179] **R-614**, Harold Theriault Jr., Written Submission to the JRP (Jun. 26, 2007); **R-615**, Submission of the Green Party of Canada to the White Point Quarry and Marine Terminal Project Joint Review Panel (Jun. 29, 2007), p. 11: ("In other words, the "do nothing" alternative is more likely an attractive option in preserving a growing number of tourism jobs, maintaining a lucrative fishery and protecting a way of life.")

[180] **R-616**, The Digby Neck Community Development Association, Response to the Environmental Impact Statement on the Whites Pont Quarry and Marine Terminal (Undated), p. 21: ("In the vision that the WVDA, along with hundreds of local citizens and community groups came up with, the large scale industrial resource extraction was notable by its absence" and "In fact both the town and municipals council have come out publicly against the quarry. The proponent has produced no evidence that there is any regional planning document that calls for this kind of development.")

[181] **R-592**, CPAWS – Review of EIS, p. 5.

[182] **R-592**, CPAWS – Review of EIS, p. 4.

[183] **R-212**, JRP Report, p. 73.

of the quarry activities would generate extremely fine particles.[184] The JRP was concerned that the aggregate fines would likely become windborne and could present a serious risk of adverse environmental effects on human receptors; it was of the view that "[a]ppropriate modeling of the dispersion patterns of these very fine particles in local wind conditions would be necessary to quantify the distance and directions these particles could travel."[185] Furthermore, the project would change noise levels from "quiet rural" to a continuous noise environment for some receptors.[186] Periodic blasting and increased traffic would also add to the noise effects.[187] The changes with respect to noise, dust, light, and traffic were factors that could constitute an adverse environmental effect.[188]

103. Furthermore, as noted above, the proponent's analysis of surface water and groundwater impacts was hampered by lack of data and inappropriate modelling. While "[t]he Proponent Bilcon accepted the possibility that the Project may affect water supplies on Digby Neck and proposed to supply water residents within a defined distance of the quarry face," these measures did not prevent the water supply issues from occurring.[189]

104. In my view, taking all of the above into consideration, if the JRP had not adopted the approach that it did in breaching NAFTA, it would have still been both a reasonable and probable outcome for the JRP to find that the project would likely have an adverse effect on local residents' reasonable enjoyment of life and property because of direct impacts of quarrying activities such as traffic, dust, vibration, and noise, as well as from potential groundwater impacts to wells. Such conclusions would not support a recommendation for project approval.

V. ANALYSIS OF THE JRP'S BROADER CONCERNS

105. In addition to concerns relating to the project's environmental effects, the JRP Report also identified a number of broader concerns relating to factors such as: (1) the adequacy of

[184] **C-155,** Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 2, Volume 2 (Jun. 18, 2007), p. 277:20-277:22.

[185] **R-212**, JRP Report, p. 73.

[186] **R-212**, JRP Report, p. 73.

[187] **R-212**, JRP Report, pp. 73-74.

[188] **R-212**, JRP Report, p. 74.

[189] **R-212**, JRP Report, p. 74.

information provided on the project; (2) public consultations; and (3) whether the project would have contributed to the sustainable development of the surrounding communities.

A. Information Provided on the Whites Point Project

106. Throughout its Report, the JRP identified instances where the proponent provided, in the JRP's view, inconsistent or inadequate information regarding the project. For example, the JRP noted that there was insufficient baseline information on the marine biological environment to detect long-term changes,[190] water circulation in the Bay of Fundy,[191] and traditional community knowledge.[192] Some of the JRP's concerns with respect to the adequacy of Bilcon's responses are summarized in Table 2-1 of the Report.[193]

107. Specifically, the panel noted that "[p]articular elements of the proposed Project (including blasting protocols and dimensions, location of operational elements, site drainage and water management mechanisms, and protocols for docking the ship) varied between and within documents."[194] The inconsistencies in the project description persisted through the hearing process and in written undertakings prepared by the proponent, which complicated the JRP's task of identifying and assessing the project's effects.[195]

108. The JRP also identified several areas where information provided by the proponent was insufficient, or where the proponent did not respond to or fully answer the questions asked of it. For example, as noted by the panel, its determination of the full extent of the project's possible adverse impacts on the coastal wetland "was hampered by the lack of baseline date on its hydrologic requirements and a viable strategy to assure its continued existence."[196] The JRP

[190] **R-212**, JRP Report, p. 8.

[191] **R-212**, JRP Report, p. 55.

[192] **R-212**, JRP Report, pp. 88-89.

[193] **R-212**, JRP Report, p. 85.

[194] **R-212**, JRP Report, p. 25.

[195] **R-212**, JRP Report, p. 25.

[196] **R-212**, JRP Report, p. 7 and 35.

concluded that the proponent had not demonstrated that its mitigation measures would protect the wetland.[197]

109. While the JRP observed that the proponent had proposed using adaptive management to address environmental issues arising in the implementation of the project, it was of the view that such an approach would be inappropriate in the absence of baseline information.[198] Where adaptive management was proposed, the EIS Guidelines required the proponent to explain how it would operate and the role of the public in such a process.[199] However, as noted by interveners at the public hearing, Bilcon's EIS failed to provide details as to how the adaptive management approach would be implemented.[200]

110. In my experience, inadequate or incomplete information has the effect of introducing uncertainty over the type, magnitude, and significance of possible project impacts, and impairs the ability of a panel, the public, and government to make informed decisions on whether potential impacts can be mitigated. In such a scenario, a panel could certainly recommend against approval of a project where potential adverse or significant environmental effects are uncertain or unacceptable.

B. Public Consultation

111. The JRP Report also identified concerns regarding the effectiveness of Bilcon's public consultations.

112. Bilcon's consultations with the public centred on its Community Liaison Committee ("CLC"). However, the JRP observed that "[t]he CLC failed to engage key segments of the population, most significantly the local fishers, who could have provided valuable information on the local marine ecology and coastal conditions."[201] Moreover, on many occasions, there was

[197] **R-212**, JRP Report, pp. 35-36.

[198] **R-212**, JRP Report, p. 92. See for example, submissions at the JRP Public Hearing by Partnership on Sustainable Development – David Vanderzwaag: **C-162**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 9, Volume 9 (Jun. 26, 2007), pp. 2052:2-2061:12, regarding concerns relating to Bilcon's adaptive management approach and reverse onus approach.

[199] **R-210**, EIS Guidelines, p. 52.

[200] **C-162**, Whites Point Quarry and Marine Terminal Public Hearing Transcript, Day 9, Volume 9 (Jun. 26, 2007), p. 2052:2-18.

[201] **R-212**, JRP Report, p. 12.

a breakdown in communications between Bilcon and community members.[202] This led to concerns regarding the lack of transparency about the project proposal and concerns regarding the ability of the proponent and community members to work together effectively if the project were to proceed.[203] It concluded that "[t]he Proponent did not effectively work with project opponents to find mutually agreeable solutions to identified problems."[204]

113. In my experience, public consultation is always an important aspect of an EA process. A proponent's failure to conduct an adequate consultation program could contribute to public uncertainty about the project and its impacts. For example, as noted by the Whites Point JRP, the proponent's efforts to consult with Aboriginal communities were not successful, leaving traditional knowledge out of the EIS.[205] Similarly, although the proponent indicated that it had consulted with local fishers, some fishers and representatives of fishing organizations stated that they had not been consulted. This led to the JRP concluding that "some of elements of the EIS may be inaccurate."[206]

114. The *NSEA* not only provides for access to information, but for "*effective* public participation" in the formulation of decisions affecting the environment.[207] In my view, the JRP's findings regarding the shortcomings in the proponent's public consultations would have still been made absent the NAFTA breach and could have been a relevant factor in the JRP's recommendation to the Minister.

C. Contribution to Sustainable Development

115. The JRP Report identified a number of concerns with respect to the project's contribution to sustainable development. For example, with respect to the coastal wetland, the panel expressed its belief that "the likelihood of high-volume, high flowrate emergency water releases during storm events sheds considerable doubt over the long-term sustainability of proposed plant

[202] **R-212**, JRP Report, p. 88.

[203] **R-212**, JRP Report, p.88.

[204] **R-212**, JRP Report, p. 88.

[205] **R-212**, JRP Report, pp. 12 and 67.

[206] **R-212**, JRP Report, p. 76.

[207] **R-5**, *NSEA*, s. 2 (h).

and animal communities in the constructed wetland."[208] More generally, the JRP observed in its Report that "[d]espite the Panel's guidance, the EIS rarely addressed the broader implications of the proposed Project on the long-term sustainable development of communities."[209] Furthermore, "[t]he Proponent's approach to sustainable development does not adequately account for the region's identified strategies for sustainability."[210] Overall, the Whites Point JRP concluded that the "Project is unlikely to make a meaningful contribution to sustainability of Digby Neck and Islands."[211]

116. In my opinion, the JRP's finding with respect to the Whites Point project's contribution to sustainable development was well within the scope of its provincial mandate. As explained above, a central goal of the *NSEA* includes "maintaining the principles of sustainable development."[212] This is reflected in the EIS Guidelines for the Whites Point EA, which stated that the JRP would evaluate the project's contribution to sustainability.[213] In particular, as noted in the EIS Guidelines, "[p]romotion of sustainable development is a fundamental purpose of environmental assessment and provides an effective means of integrating environmental, socio-economic and cultural factors into decision-making."[214]

117. A sustainability assessment relates to the larger context in which proposed projects exist, which is informed by local and provincial policies. In previous review panels that I have chaired, the issue of sustainability was an important factor in the panel's recommendations to the Minister. For example, in the Keltic Petrochemicals EA, a key concern identified by the panel in its Report related to the sustainability of the resource base for the project (i.e. non-renewable fossil fuel resources).[215] The panel's concern was with sustainability in the global sense, regarding the importation and use of a non-renewable fossil fuel resource, with global warming

[208] **R-212**, JRP Report, p. 7.

[209] **R-212**, JRP Report, p. 91.

[210] **R-212**, JRP Report, p. 91.

[211] **R-212**, JRP Report, Table 3-2, p. 98.

[212] **R-5**, *NSEA*, s. 2(b).

[213] **R-210**, EIS Guidelines, p. 11.

[214] **R-210**, EIS Guidelines, p. 10.

[215] **R-513**, *Report and Recommendations to the Nova Scotia Minister of Environment and Labour from the Nova Scotia Environmental Assessment Board for the Review of Keltic Petrochemicals Inc.* (Feb. 21, 2007), pp. 129-131.

implications, which went beyond the scope of this particular review. Nevertheless, the panel raised concerns with respect to the long-term viability of the proposed project and recommended that the Minister carry out a broader review to determine, if the project was sustainable.[216] This differed from the case of the Whites Point project, where the sustainability issues related to viability of local communities and industries dependant on renewable resources which may have been impacted.

118. Accordingly, in my view, it was appropriate for the Whites Point JRP to base its sustainability analysis on policy documents adopted by federal, provincial, and local governments and development agencies.[217] Specifically, the JRP considered the surrounding area's international recognition for "its efforts to create a sustainable economy based on good management of fisheries and eco-tourism activities."[218] These were issues within the panel's scope of review. Therefore, in my opinion, it was reasonable and well within the mandate of the Whites Point JRP to make the findings that it did regarding sustainability. I do not believe the JRP's comments on the project's contribution to sustainable development would have been different in a report in which there was no NAFTA breach. Moreover, they would not be consistent with an ultimate recommendation for project approval.

VI. CONCLUSIONS

119. Review panels in the Nova Scotia EA process serve in an advisory role to the government. Pursuant to Part IV of the *NSEA*, review panels must make one of three recommendations to the Minister: (1) to approve the undertaking, (2) to reject the undertaking, or (3) to approve the undertaking with conditions. A review panel's mandate, within the constraints of governing legislation and guidelines, is broad. The *NSEA* requires the consideration of both bio-physical and socio-economic effects. The term "socio-economic" is not a defined term under provincial legislation. In practice, the evaluation of socio-economic conditions includes a broad range of factors, such as impacts on the local economy, human health, physical and cultural heritage, and the reasonable enjoyment of life and property.

[216] **R-513**, *Report and Recommendations to the Nova Scotia Minister of Environment and Labour from the Nova Scotia Environmental Assessment Board for the Review of Keltic Petrochemicals Inc.* (Feb. 21, 2007), p. 131.

[217] **R-212**, JRP Report, pp. 90-91.

[218] **R-212**, JRP Report, p. 91.

120. Although the Whites Point JRP Report only expressly identified the project's "inconsistency community core values" as both a significant and adverse environmental effect, the JRP found that the project would have an adverse environmental effect, or likely or potential adverse environment effect, on endangered marine mammals, lobsters, the coastal wetland, groundwater, fisheries, and the reasonable enjoyment of life and property. The JRP also identified concerns regarding the project's effects on surface water and tourism. Additionally, the JRP expressed broader concerns over the adequacy of information provided by the proponent and its public outreach. It also concluded that the project was unlikely to make a meaningful contribution to the sustainable development of the Digby Neck and Islands. In the end, putting the JRP's acts found to be in breach of NAFTA aside, all of these findings were relevant factors that could have formed a recommendation that the project should not proceed. Based on the foregoing, I am of the opinion that absent of the NAFTA breach it was certainly not a foregone conclusion that the Whites Point project would have been recommended for approval under Nova Scotia law.

Dated: June 9, 2017

Tony Blouin, Ph. D.
Halifax
Nova Scotia

ANNEX 1. RESUME OF TONY BLOUIN

PERSONAL

Name:	BLOUIN, Anthony Charles Georges
Address:	2561 Joseph St. Halifax, Nova Scotia B3L 3H3
Citizenship:	Canadian

EDUCATION

1985	Ph.D., Biology	Dalhousie University, Halifax, Nova Scotia.
1981	M.Sc., Zoology	University of Toronto, Toronto, Ontario.
1977	B.Sc., Honours Biology (cum laude)	University of Ottawa, Ottawa, Ontario.

PROFESSIONAL TRAINING

Certificate in Human Resource Management, Newfoundland Public Service Commission, 1994.

Effective Negotiating and Influencing Skills, St. Mary's University, 2005.

Management and Supervision Certificate, American Water Works Association, 2013.

Performance Matters Training Series Certificate, Halifax Water, 2014.

PROFESSIONAL EXPERIENCE

2008-Present Manager, Regulatory Compliance, Halifax Water
Reporting to the Director, Environmental Services, Halifax Water. Responsibilities include management of the Regulatory Compliance Section, including sampling for drinking water treatment and distribution systems, and wastewater treatment facilities; data management and analysis; and reporting to provincial and federal regulators as required under legislation or conditions of permits. Responsible for ongoing liaison with provincial and federal regulatory staff on water and wastewater policy development, regulations, environmental issues, permits and approvals, and reporting relationships. Responsible for staff management and budget preparation and management. Major projects include:

- Creation of the Regulatory Compliance section and program;
- Participation with Canadian Water & Wastewater Association and Federation of Canadian Municipalities on consultations for the development of the CCME Canada-wide Strategy for the Management of Municipal Wastewater, and the federal Wastewater System Effluent Regulations (WSER) under the Fisheries Act;
- Implementation of WaterTrax and PI database systems for wastewater data;
- Development of Compliance Plans and CCME/WSER Implementation Plans for municipal wastewater infrastructure;
- Coordination with operational department staff to identify and address compliance issues;
- Implementation of the ISO 14001 EMS program for wastewater.

2013-2014 Chair, Environmental Assessment Review Panel.
Appointed by the Minister, NS Environment, to conduct a review of the Goldboro LNG project proposal.

2004-2012 Chair, Nova Scotia Environmental Assessment Board (Volunteer Appointment, 2 Terms).
Performed the duties and responsibilities of the Chair as defined by the Environment Act and Regulations, chaired public Panel hearings for projects under review, provided recommendations to the Minister. Major project hearings for:

- Highway 104 Bypass;
- Keltic Petrochemicals and Liquified Natural Gas Terminal.

1996-2008 Manager, Environmental Performance (previous Titles: Principle for Environmental Initiatives, Manager of Environmental Policy).
Reported to the following positions: Commissioner of Priority and Policy; Director of Environmental Services; Director of Planning; and Director of Infrastructure and Asset Management, Halifax Regional Municipality. Responsibilities included policy analysis and development, budget preparation and management, project management, coordination and evaluation, contract management and community liaison. The positions provided environmental vision and focus to the Regional Municipality. Major projects included:

- Water Quality Management - responsible for creation, conduct and management of the HRM water quality monitoring program, including field work, sample analysis, data analysis, budget management and interpretation of results for senior management and Council;
- Watershed Studies - responsible for the design and conduct of watershed studies for land suitability and water/sewer servicing option analysis, as required under the Regional Plan;
- Regional Planning - co-chair of the Environmental Assets Task Group and member of the Management Steering Committee for the municipal 25-year Regional Planning Initiative;
- Water Resources Management Policy - responsible for project design and management, policy development and advice, project implementation;
- Risk Analysis for HRM Wastewater Treatment Facilities - Capacity and impact analysis;
- Halifax Harbour Solutions - responsible (with project Team) for process design and management for project planning and implementation, Environmental Assessment and regulatory process management, and Environmental Effects Monitoring program;
- Pesticide By-Law - responsible for development of process and policy leading to approval and implementation of the By-Law.

1995-1996 Vice-President, Environmental Consultant.
Reported to the President, Lane Environment Limited, Halifax, Nova Scotia. Responsibilities included preparation of project proposals and budgets, negotiation of contracts, data collection and analysis, report writing, staff supervision, budget and project management. Representative projects included:

- Environmental Assessment and Review Study of the Halifax G-7 Summit (Ecology Action Centre/Halifax Summit Office);
- Biodiversity/Environmental Management Training Course, Cuba (Global Environment Facility - United Nations Development Program).

1991-1995 Director, Environmental Assessment Division.
Reported to the Assistant Deputy and Deputy Ministers, Department of Environment, St. John's, Newfoundland. Responsibilities as Divisional Director included:

- supervision and management of the Environmental Assessment Section, Pesticides Control Section, and Environmental Impact Management Section;
- responsibility for Divisional program and policy development;
- development of legislative and regulatory initiatives;
- preparation of Cabinet submissions;
- Divisional budget planning and control;
- personnel management (16 professional positions, plus terms and contracts) including hiring;
- Chair of interdepartmental Environmental Assessment Committees;
- liaison with Federal government on joint Environmental Assessments;
- participation on interdepartmental and intergovernmental Committees such as:
    - Regulatory Advisory Committee, Canadian Environmental Assessment

Agency,
- Environmental Science Advisory Committee, Department of Education,
- EA Harmonization Task Group, CCME,
- Canadian EA Administrators Group,
- Innu and Inuit Land Claim Negotiating Teams;
- management of Divisional computing resources including Novell LAN.

Major goals of the environmental assessment program were to ensure adequate information for informed decision-making, predict environmental impacts prior to developments, identify appropriate mitigative measures, and analyze resulting residual impacts. The major goal of the environmental impact management program was to ensure adherence to terms and conditions of release during project construction and operation. Major goals of the pesticide control program were to ensure proper use of pesticides through operator training and certification, licensing, and inspection of field operations and vendors.

1986-1991 Water Quality Manager.
Reported to the Director, Water Resources Division, Department of Environment and Lands, St. John's, NF. Responsibilities as a senior professional of the Surface Water Branch, Water Resources Management Division included:

- creation of the provincial water quality assessment and management program;
- design of management strategies to resolve water quality problems;
- development of water quality guidelines;
- financial management for the water quality assessment program;
- supervision of the Regional Water Quality Officers;
- administration of the Canada-Newfoundland Water Quality Monitoring Agreement;
- sampling network design and optimization;
- quality control for field, laboratory, and data management techniques;
- regional computer system installation, configuration and management;
- data management, analysis and interpretation;
- preparation of scientific, technical, financial and administrative reports;
- participation on Provincial and Federal-Provincial committees.

Major goals of the water quality program were to collect and compile watershed land use information to elucidate land use - water quality relationships, and to develop water quality objectives for preservation of desired quality for a variety of users.

1983-1986 Environmental Consultant, Founding Principal and Company Secretary. Reported to the President, P. Lane and Associates Ltd., Halifax, Nova Scotia. Experience included:

- preparation of research contracts, grant proposals and Environmental Impact Statements, including experimental design, work plans, and budget estimates;
- implementation of field programs;
- data analysis and interpretation;
- report preparation.

Participation in representative company projects including:

1984-1985 Ecological impacts of the budworm-killed forest. Environment Canada.

1984-1985 Jack Lake Land Assembly - Environmental impact assessment of surface and groundwater concerns related to suburban development. CMHC and Province of N.S.

1985 Hibernia Environmental Impact Statement: Risk assessment and modeling of sea birds and the pelagic ecosystem. Critique of Mobil E.I.S. Environment Canada.

1985-1986 Chezzetcook salt marsh - Environmental impact assessment and baseline data collection for terrestrial and marine ecosystems related to Highway 107 construction. N.S. Dept. of Transportation.

1986 Caribou risk assessment in regard to power transmission lines. Newfoundland Hydro.

1986 Review and critique of field studies concerning oil and dispersants. National Research Council and U.S. National Academy of Sciences.

1980-1986 Research Associate.
Dalhousie University, Department of Biology, Halifax, Nova Scotia. Experience included:

- design and management of field sampling and experimental programs;
- design and implementation of automated data recording system;
- identification and enumeration of plankton samples;
- basic chemical analysis of water samples;
- quantitative data analysis, including summary and multivariate statistics, ANOVA, qualitative and quantitative system modeling;
- data interpretation and report preparation;
- computer data base searches and literature reviews.

Direct responsibility for all aspects of the following research contracts for Environment Canada:

1983 - 1984 Biogeographic survey of lake plankton in relation to pH range in Nova Scotia.

1982 - 1983 An experimental approach to understanding the effects of acid precipitation, liming, and nutrient enrichment on a lake plankton community.

1981 - 1982 Cause-effect relationships in planktonic food webs of lakes undergoing acid precipitation.

1980 - 1981 A zooplankton study of three lakes in Kejimkujik National Park in regard to acid precipitation.

Participated in work on the following research grants:

Natural Sciences and Engineering Research Council of Canada:

1984 - 1986 Testing hypotheses about vertical migration using the Dalhousie Tower Tank.

1984 - 1985 Qualitative food web analysis of lakes 223 and 227 in the Experimental Lakes Area.

1981 - 1984 Experimental validation of cause and effect in polluted marine ecosystems.

U.S. Environmental Protection Agency:

1982 - 1986 Qualitative environmental impact assessment: marine plankton communities.

National Oceanic and Atmospheric Administration, U.S. Department of Commerce:
1982 - 1984 A qualitative approach to cause and effect in evaluating marine pollution. Year II; Year IIIA: validation of predator-prey pathways, benthic-pelagic coupling and stability criteria; Year IIIB: data analysis and computer studies.

1985-1986 Instructor (Half-time). Dalhousie University, Department of Biology, Halifax, Nova Scotia.

Courses:
BIO 2060A - Introductory Ecology
BIO 2066B - Human Ecology

1980-1984 Teaching Assistant. Dalhousie University, Department of Biology, Halifax, Nova Scotia.

Courses:
BIO 2060A - Ecology (1980-81, 1982-84)
BIO 3061B - Communities + Ecosystems (1980-81, 1982-84)
BIO 2046 - Evolutionary Ecology (1981-82)

1977-1980 Teaching Assistant. University of Toronto, Department of Zoology, Toronto, Ontario.

Courses:
BIO 230H/231H - Ecology I + II
BIO 360H/361H - Biometrics I + II

PUBLICATIONS

Journal Articles:

1990 Trophic response to phosphorus in acidic and non-acidic lakes in Nova Scotia, Canada. Hydrobiologia. Vol. 191: 105-110. (2nd author, with J. Kerekes and S. Beauchamp).

1989 Patterns of plankton species, pH and associated water chemistry in Nova Scotia lakes. Water, Air and Soil Pollution. Vol. 46: 343-358.

1985 Qualitative analysis of the pelagic food webs of three acid-impacted lakes. Internationale Revue der Gesamten Hydrobiologie. Vol. 70: 203-220. (2nd author, with P.A. Lane).

1984 Comparison of plankton-water chemistry relationships in three acid-stressed lakes. Internationale Revue der Gesamten Hydrobiologie. Vol. 69: 819-841. (with P.A. Lane, T.M. Collins and J. J. Kerekes).

1984 Plankton of an acid-stressed lake (Kejimkujik National Park, Nova Scotia, Canada). Part

2. Population dynamics of an enclosure experiment. Internationale Vereinigung fur Theoretische und Angewandte Limnologie. Vol. 22 (1): 401- 405. (with T.M. Collins and J.J. Kerekes).

1984 Plankton of an acid-stressed lake (Kejimkujik National Park, Nova Scotia, Canada). Part 3. Community network analysis. Internationale Vereinigung fur Theoretische und Angewandte Limnologie. Vol. 22 (1): 406-411. (2nd author, with P.A. Lane).

Workshop Proceedings:

1983 Quantitative analysis of lake communities and enclosure experiments in Kejimkujik National Park. Proceedings of the Kejimkujik Calibrated Catchments Program Workshop, April 26, 1983. Editor J. J. Kerekes. pp. 63-66. (with P.A. Lane and T.M. Collins).

1983 Qualitative analysis of the lake food webs in Kejimkujik National Park. Proceedings of the Kejimkujik Calibrated Catchments Program Workshop, April 26, 1983. Editor J. J. Kerekes. pp. 67-69. (2nd author, with P.A. Lane and T.M. Collins).

1982 Zooplankton studies. Report of the Proceedings of the Kejimkujik Calibrated Catchments Program Workshop, November 18, 1981. Ed. J. Kerekes. pp. 55-56. (with P.A. Lane).

Technical Reports:

Canada - Newfoundland Water Quality Monitoring Agreement:

Annual Reports: 1986-87, 1987-88, 1988-89, 1989-90, 1990-91

1991 Bottom Sediment Survey Report: 1987-1989. (with S. Roussel and R. Arseneault). 70 pp.

1990 Organochlorinated pesticides and polychlorinated biphenyls in water of selected Newfoundland rivers. (with S. Roussel and R. Arseneault). 27 pp.

1989 Exploits River Recurrent Survey Report, 1987-88. (with S. Roussel and R. Arseneault). 98 pp.

1989 Quality Assurance / Quality Control Program: Results From the First Two Years of Monitoring. (with S. Roussel and R. Arseneault). 60 pp.

1988 Index Basin Network, Site Documentation Report. 213 pp.

1988 Water quality data summary statistics 1977-1986. 153 pp.

1982 Plankton-nutrient interactions in Pebbleloggitch, Beaverskin and Kejimkujik Lakes in Kejimkujik National Park, Nova Scotia in 1980 and 1981. Dalhousie University Technical

Report. Volume I. 182 pp., Volume II. 221 pp. (with P.A. Lane and T. Collins).

1981 A comparison of three plankton communities in Kejimkujik National Park, Nova Scotia. Dalhousie University Technical Report. Volume I. 143 pp., Volume II. 166 pp. (with P.A. Lane and K. Cook).

1981 Distribution and abundance of zooplankton in three lakes in Kejimkujik National Park, Nova Scotia. Dalhousie University Technical Report. 139 pp. (with P.A. Lane and K. Cook).

Theses:

1985 Comparative patterns of plankton communities under different regimes of lake acidity in Nova Scotia, Canada. Dalhousie University. Halifax, Nova Scotia. 276 pp. Ph.D. Thesis.

1980 Effects of Chaoborus (Diptera: Chaoboridae) predation upon limnetic zooplankton. University of Toronto. Toronto, Ontario. 80 pp. M.Sc. Thesis.

1977 Occurrence of allelopathy in freshwater phytoplankton communities. University of Ottawa. Ottawa, Ontario. 40 pp. B.Sc. Honours Thesis.

Other:

1992 Water Resources Atlas of Newfoundland. Newfoundland Department of Environment and Lands, St. John's, NF. 79 pp. (Co-Editor with A. Beersing).

SEMINARS AND CONFERENCES

2006 Needs for estuarine/nearshore monitoring information: Decision-makers perspective. Nearshore Marine Ecological Monitoring Workshop, BIO (Invited Speaker).

1999 Solid Waste Management in HRM. Sherkin Island Marine Institute Conference: Landfill, the Issues That Must be Addressed. Cork, Ireland (Invited Speaker).

1989 Water Quality in Newfoundland: Results from the Federal-Provincial Agreement. Canadian Water Resources Association 42nd Annual Conference, Halifax, Nova Scotia, June 19-21, 1989.

1988 Patterns of plankton species, pH and associated water chemistry in Nova Scotia lakes. Kejimkujik "88": Symposium on the Acidification of Waters in Kejimkujik National Park, Nova Scotia, Canada, Oct. 25-27, 1988, Wolfville, N.S.

1987 Trophic response to phosphorus in acidic and non-acidic lakes in Nova Scotia, Canada. Symposium on Trophic Relationships in Inland Waters, Hungary 1987. (2nd author, with J. Kerekes and S. Beauchamp).

1986 Zooplankton and phytoplankton communities in relation to pH and associated water

chemistry in twenty lakes in Nova Scotia. McGill University, Montreal, Quebec. (Invited speaker).

1985 Biological response to acidification and nutrient levels in three lakes sensitive to acidification in Nova Scotia. International Symposium on Acidic Precipitation, Muskoka, Ontario. (3rd author, with J. Kerekes, S. Beauchamp, and C. Stewart).

1985 Relationships of plankton communities and acidity in Nova Scotia lakes. Dalhousie University, Halifax, Nova Scotia. (Invited speaker).

1983 Nutrient enrichment using experimental marine plankton communities. I. Dalhousie Tower Tank. American Society of Limnology and Oceanography, 46th Annual Meeting. St. John's, Newfoundland. (2nd author, with T. M. Collins).

1983 Plankton of an acid-stressed lake (Kejimkujik National Park, Nova Scotia, Canada). Part 2. Population dynamics of an enclosure experiment. XXIInd Annual Congress of the International Association of Theoretical and Applied Limnology. Lyon, France. (Presenter, with T. M. Collins and J. J. Kerekes).

1983 Plankton of an acid-stressed lake (Kejimkujik National Park, Nova Scotia, Canada). Part 3. Community network analysis. XXIInd Annual Congress of the International Association of Theoretical and Applied Limnology. Lyon, France. (Presenter, 2nd author with P. A. Lane).

1983 Quantitative analysis of lake communities and enclosure experiments in Kejimkujik National Park. Kejimkujik Calibrated Catchments Program Workshop. Dalhousie University, Halifax, Nova Scotia.

1981 Zooplankton studies. Kejimkujik Calibrated Catchments Program Workshop. Atmospheric Environment Service, Bedford, Nova Scotia.

PROFESSIONAL SOCIETIES (Past)

North American Lake Management Society
American Society of Limnology and Oceanography
International Association of Theoretical and Applied Limnology
Society of Canadian Limnologists
International Association for Impact Assessment
Canadian Water Resources Association
Canadian Cartographic Association

FELLOWSHIPS AND AWARDS

1980 - 1984 Dalhousie University Graduate Fellowship.

1983 American Society of Limnology and Oceanography, Travel Award for 46th

Annual Meeting, St. John's, Newfoundland.

1977 - 1980 Natural Sciences and Engineering Research Council, graduate student summer stipend.

OTHER QUALIFICATIONS

Past *Ad hoc* reviewer for following scientific journals:

Water, Air and Soil Pollution
Environmental Pollution

Basic working knowledge of French.

ADDITIONAL RELATED SKILLS

Familiar with micro-computer hardware and software configuration, including the following systems:

- Windows XP and 7 systems, in Novell LAN environment
- MSOffice and WordPerfect Suites
- Groupwise, Outlook
- Excel, Lotus 1-2-3 and Quattro Pro spreadsheets
- ArcGIS Geographic Information software
- dBase database manager
- Systat/Sygraph statistical analysis system
- WaterTrax online database system
- Intelex ISO Management software
- Various communications/Internet packages
- Contribute and HomeSite Web authoring software
- Various tablet computer systems including Windows 8