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May 31, 2013

FILED ELECTRONICALLY

Secretary to the Joint Review Panel
Enbridge Northern Gateway Project
444 – Seventh Avenue SW
Calgary, AB T2P 0X8

Attention: Ms. Sheri Young

Dear Ms. Young:

Re: Hearing Order OH4-2011 Northern Gateway Pipelines Inc. Enbridge Northern Gateway Project Application of 27 May, 2010 – File OF-Fac-Oil-N304-2010-01 – Haisla Nation - Final Written Argument and Oral Argument

Please find enclosed the Final Written Argument of the Haisla Nation.

Please be advised that the Haisla Nation intends to present Oral Reply Argument. The details are:

- Jennifer Griffith, Legal Counsel, will present the oral Argument;
- Anticipated time for top-down oral Argument is one hour;
- Participation is anticipated to be in person.

Yours truly,

DONOVAN & COMPANY

Jennifer Griffith
JG/bf

Enclosure

FINAL ARGUMENT

HAISLA NATION

May 31, 2013

NORTHERN GATEWAY PIPELINE PROJECT

File OF-Fac-Oil-N304-2010-01 01

OH-4-2011

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I. OVERVIEW

1. The Haisla Nation submits that the Joint Review Panel should recommend that the proposed project is not in the public interest and that no certificate of public convenience and necessity be granted for either the oil pipeline or the condensate pipeline. In addition, the Panel should recommend that federal government departments be advised that they should refrain from courses of action that permit the project to proceed, as it will cause significant adverse environmental effects that cannot be mitigated and that are not justified in the circumstances.

2. The proposed project is not in the public interest and not deserving of a positive decision statement for the following reasons:

   - Northern Gateway has failed to provide information required under the legislation governing the review of the proposed project, including information required for a s. 52 *National Energy Board Act* decision and an environmental assessment under the *Canadian Environmental Assessment Act, 2012*, the National Energy Board's *Filing Manual* and the *Scope of Factors* issued by the Canadian Environmental Assessment Agency. This information is critical to the assessment of the proposed project, and Northern Gateway's failure to provide it is fatal to any positive recommendation;
   - The benefits Northern Gateway has ascribed to its proposed project are outweighed by the burdens associated with the project;
   - The proposed project is likely to result in significant adverse environmental effects;
   - The significant adverse environmental effects cannot be justified in the circumstances; and
   - The proposed project is not in the Canadian public interest.

3. The Haisla Nation would be profoundly impacted by the proposed project. The Haisla Nation occupies a traditional Territory at the head of Kitimat Arm that encompasses approximately 85 km of the proposed pipeline right-of-way (including part of the Hoult Tunnel and the Hoult Tunnel west portal), the tank and marine terminal, and a swath of the waters through which tanker traffic associated with the project will travel. The Haisla Nation has participated in the JRP review process as an intervener and is now submitting final written argument.

4. This argument will examine the following aspects relevant to Northern Gateway's application:

   - The Haisla Nation's aboriginal rights and title;
   - The economic benefits ascribed to the proposed project by Northern Gateway and the economic burdens associated with the proposed project;
   - The environmental and socio-economic impacts associated with the proposed pipelines;
   - The environmental and socio-economic impacts associated with proposed terminal;
   - The environmental and socio-economic impacts associated with marine shipping;
   - The public interest; and

- The Panel's proposed potential conditions for the proposed project.

5. The introduction below will help the Panel to understand the basis for the Haisla Nation's submission that the proposed project is not in the public interest and should not receive the certificates applied for under the *National Energy Board Act*, as well as the Haisla Nation's submission that the proposed project will result in significant adverse environmental effects.

1. Introduction

6. Northern Gateway (NG) is proposing to construct an oil export and condensate import project consisting of pipelines and the associated marine terminal infrastructure. Marine shipping has been scoped into the project.

7. Northern Gateway has submitted an application for two certificates under s. 52 of the *National Energy Board Act* (*NEBA)*,[1] one for a condensate pipeline, to import condensate from offshore to Kitimat, BC and ship it to Bruderheim, Alberta. The other is for an oil pipeline, to ship oil – specifically diluted bitumen and synthetic crude – from Bruderheim, Alberta to Kitimat, BC, for shipping offshore, with associated facilities consisting of a tank and marine terminal and associated shipping.

8. The proposed project is a reviewable project under the *Canadian Environmental Assessment Act* (*CEAA*, *2012*).[2]

9. Under the legislative scheme which now governs the JRP review process, the Panel is tasked with writing a report that:

   - sets out the Panel's recommendation, under s. 52 of the *NEBA*, on whether a certificate of public convenience and necessity should be issued for the proposed project; and
   - that also set out the Panel's rationale, conclusions and recommendations relating to the environmental assessment of the project under *CEAA 2012*.

10. In addition, and regardless of the nature of its recommendations on the s. 52 *NEBA* certificate, the Panel's report must set out conditions which should be attached to any certificate that is issued.

11. The Panel's recommendations must be informed by a number of issues, as outlined below.

2. Overview of Haisla Nation Argument on Aboriginal Rights

12. One issue the Panel must be informed of and fully understand is the impacts which the proposed project will have on the lands, water, and resources of Haisla Nation Territory, and the way in which these impacts will affect Haisla Nation aboriginal rights and title.

13. It is thus important for the Panel to have a clear understanding of who the Haisla Nation is and how the Haisla Nation and its members stand to be impacted by the proposed project. Section II of this submission sets out the history of the Haisla Nation, the strength of the

[1] *National Energy Board Act*, R.S.C. 1985, c. N-7.
[2] *Canadian Environmental Assessment Act, 2012*, S.C. 2012, c. 19, s. 52 (*CEAA 2012*).

Haisla Nation's claim to aboriginal rights and aboriginal title to the lands, water, and resources that will be impacted by the proposed project, Haisla Nation cultural heritage, the status of consultation and accommodation, and whether the honour of the Crown is being upheld.

3. Overview of the Haisla Nation's Argument on Economic Benefits and Burdens and the Public Interest

14. Section 52 of the *NEBA* requires a determination with respect to "the present and future public convenience and necessity" of the proposed project pipeline and associated facilities before a certificate can be issued under the Act. The "present and future public convenience and necessity" test has been equated with "public interest".[3]

15. Pursuant to s. 52(2) of the *NEBA,* in making its recommendation, the Panel shall have regard to all considerations that appear to be related to the pipeline and to be relevant, and may have regard to the following:

    (a) the availability of oil, gas or any other commodity to the pipeline;
    (b) the existence of markets, actual or potential;
    (c) the economic feasibility of the pipeline;
    (d) the financial responsibility and financial structure of the applicant, the methods of financing the pipeline and the extent to which Canadians will have an opportunity to participate in the financing, engineering and construction of the pipeline; and
    (e) any public interest that in the Board's opinion may be affected by the issuance of the certificate or the dismissal of the application.

16. In accordance with s. 52(2)(e), the Panel shall have regard to "any public interest" that may be affected by the application. In evaluating the public interest and overall public good of a project, the Panel must consider and weigh the negative aspects and impacts:

> The public interest is inclusive of all Canadians and refers to a balance of economic, environmental, and social interests that change as society's values and preferences evolve over time. As a regulator, the Board must estimate the overall public good a project may create and its potential negative aspects, weigh its various impacts, and make a decision.[4]

17. As a component of its public interest analysis, the Panel must weigh and analyze the nature of the Aboriginal concerns and any negative impacts on these interests:

> The Board weighs the overall public good a project may create against its potential negative aspects, **including** any negative impacts on Aboriginal interests, and makes its decisions in accordance with the public interest. As part of the decision-making process, it takes into consideration the potential environmental and social impacts and the potential for mitigation of those impacts.[5]

[3] NEB Reasons for Decision, *Emera Brunswick Pipeline Co.,* GH-1-2006, May 2007, para. 43.
[4] NEB Reasons for Decision, *Emera Brunswick Pipeline Co.,* GH-1-2006, May 2007, para. 41.
[5] NEB Reasons for Decision, *Enbridge Southern Lights LP*, OH-3-2007, February 2008, at p. 10.

18. Thus, in its public interest analysis, the Panel must consider any negative impacts to aboriginal rights, as well as potential environment and social impacts and whether these negative impacts can be mitigated.[6] In this process, the Panel not only has discretion to consider "any public interest" that it believes may be affected by the issuance of a certificate or the dismissal of an application,[7] but has also been specifically directed by its enabling legislation to reach a conclusion in its report on the implications of the Haisla Nation's strength of claim and the potential adverse impacts of the proposed project on the Haisla Nation's asserted aboriginal rights and title, and to make recommendations for accommodative avoidance or mitigation measures.[8]

19. The Panel must also, in weighing the public interest, consider the risks to the health and safety of local populations, including residents of Kitimat and Kitaamat Village who will be live in close proximity to the proposed project, including the condensate pipeline and storage tanks.

20. The proposed project represents unique circumstances, including the transportation of highly toxic hydrocarbons through geologically and seismically unstable and remote terrain, through highly abundant, diverse, and complex yet fragile ecosystems, such as in the Kitimat River Valley, and across lands and waters to which the Haisla Nation asserts aboriginal title.

21. Members of the Haisla Nation have used the lands and waters where the proposed project will be situated for subsistence, economic, spiritual, cultural and other purposes since the "time of beginnings", and still use them in this way.

22. In light of these circumstances, the Panel's public interest determination should consider and ascribe a substantial weight to the Haisla Nation's aboriginal rights and title, traditional use, stewardship obligations and cultural heritage. The Haisla Nation's stewardship obligation is based in a concern for the environment founded on Haisla Nation identity and cultural heritage which is fundamental to the cultural integrity of the Haisla Nation.

23. The Haisla Nation submits that the proposed project, as applied for, is not in the public interest. The burdens that will likely result from the proposed project will substantially outweigh the purported benefits. The argument in support of this proposition is set out in Sections III and VII of this submission.

4. Overview of Haisla Nation's Argument on the CEAA Assessment

24. NG's application suffers from deficiencies in a number of key areas that forbid a reasonable assessment of the proposed project. This lack of information is fatal to the Panel reasonably concluding that there will not be significant adverse environmental effects from the proposed project. In addition, the degree and extent of the potential impacts on the Haisla Nation do not warrant making a determination that the proposed project is nevertheless justified.

25. NG has failed to provide information required under the *Scope of Factors* for the review of this project: NG has not provided the level of detail about aboriginal consultation required

[6] NEB Reasons for Decision, *Enbridge Southern Lights LP*, OH-3-2007, February 2008, at p. 12.
[7] NEB Reasons for Decision, *Nova Gas Transmission Ltd.*, GH-001-2012, January 2013, at p. 41.
[8] *Amended Joint Review Panel Agreement* (A2X0I0).

by the *Scope of Factors*, has not provided information about fish and fish habitat at the proposed marine terminal site that meets the *Scope of Factors* requirements, and has not provided habitat compensation plans that meet the requirements of the *Scope of Factors*. Further, NG has not assessed the impacts of climate change on marine shipping. For this reason, the Panel cannot issue a positive recommendation for the proposed project.

26. NG's Environmental and Socio-Economic Assessment (ESA) application is also deficient in a number of other key areas, including but not limited to:

- The Kitimat River Valley is an area of high geohazards and terrain stability prone to high seismic risk. Little or no information has been provided to understand whether the chosen materials, methods of construction or facility maintenance practices will mitigate accidents or malfunctions when seismic events, rock falls or slides occur.

- The risks associated with the construction of the Hoult/Clore tunnel, including the containment, management and disposal of acid rock, have not been addressed.

- The ability to remotely detect or locally monitor for pipeline leaks or malfunctions and thereby mitigate potential effects, particularly in remote areas such as the Kitimat River Valley, remains in question due to deficiencies in the current technology and local weather conditions.

- Baseline information for biophysical parameters such as the seasonal location and use of habitat by species and life stages, which is fundamental and necessary to determine the potential extent and degree of effects from the proposed project, has not been provided.

- The ESA suffers from methodological approaches that undermine its reliability including false conservatism, double-counting mitigation, unrealistic prediction confidence and significance assessment which lacks transparency.

- The ESA relies on studies which have been shown through Information Requests and oral questioning to underestimate risk and overestimate the effectiveness of mitigation.

- The full scope of the toxic effects of the products to be transported on the proposed project when spilled to the terrestrial, riverine or marine environment, to humans, fish, aquatic biota and wildlife, has not been adequately assessed.

- The fate and behaviour of products to be transported on the proposed project remains unresolved to the point where federal government scientific advisors have identified specific additional information required to assess the effects of a spill.

- The ability to respond soon enough to contain a spill and the effectiveness of existing technology to clean up a spill from the proposed pipelines, marine terminal or marine tankers, especially once the product submerges, becomes suspended, or sinks to the bottom, has not been demonstrated.

27. NG has described the environmental assessment as a planning process and as a communication process, has acknowledged that there is a lot of work that still needs to be

done, and has stated that it is seeking a framework for approval for going forward by way of conditions:

> **601.** Now, have we done all the work? No, we've got a lot of work to do. And what we've asked for, I think, in this process is a framework by which we can now do that work and do it properly and continue it on and make sure we do what we say we're going to do and show us the framework for that approval process going forward by way of conditions, et cetera.
>
> *Mr. Anderson, Transcript Vol. 106, lines 600-601*

28. The Haisla Nation agrees that there is still a lot of work to be done. The work to be done, however, is critical to the assessment of the effects of the proposed project. NG's failure to do the work prior to seeking approval for the project through the JRP process is fatal. The Panel does not have before it enough information to conclude that the proposed project will not cause significant adverse environmental effects or to make a determination that the proposed project is in the public interest. This is discussed in detail in Sections IV, V, VI and VII.

5. Haisla Nation Argument on Potential Impacts to the Haisla Nation and Public Interest

29. Even if the Panel were to determine that NG has provided enough information to allow a reasonable assessment of the significance of adverse environmental effects and the possibility of mitigation, the proposed project cannot be justified or found to be in the public interest.

30. The benefits purported to flow from the proposed project have been inflated, the proposed project is likely to cause significant adverse effects, and aboriginal rights and title have not been addressed. This is discussed in detail in Section VII.

6. Haisla Nation Submissions on Proposed Potential Conditions

31. The Panel has proposed a number of potential conditions for the proposed project. The Haisla Nation is including comments on these conditions in various sections of its submission, as warranted, but is also including a separate submission on the potential conditions in Section VIII.

7. Findings the Haisla Nation is Requesting

32. The Haisla Nation respectfully requests the Panel to make the following findings with respect to the proposed project:

- The Panel should find that NG has not established the need for the proposed project.
- The Panel should find that NG has not provided the information required to allow the Panel to assess the proposed project to determine that it is not likely to result in significant adverse environmental effects.
- The Panel should find, on the basis of the information that has been provided, that the proposed project is likely to result in significant adverse environmental effects.

- The Panel should find that the significant adverse environmental effects cannot be justified.

- The Panel should find that the proposed project is not in the public interest.

33. The submissions that follow below will elaborate on each of the issues identified above, will set out more detail about the findings requested of the Panel, and will provide support for the findings the Haisla Nation is seeking from the Panel.

II. HAISLA NATION ABORIGINAL RIGHTS AND TITLE

34. The Constitution of Canada recognizes and affirms the Haisla Nation's entitlement to use, reliance upon and exercise of control over these lands through the recognition of aboriginal rights and aboriginal title. The proposed Northern Gateway Project would result in an unjustifiable infringement of Haisla Nation aboriginal rights and title. The unjustifiable infringement of the aboriginal rights and title of the Haisla Nation is not in the public interest and is contrary to the constitutional protection afforded to such rights.

1. The Haisla Nation

35. The Haisla Nation is an Aboriginal group that has occupied the lands of Haisla Nation Territory since the time of beginnings, when the ancestors of the Haisla Nation settled the Territory approximately 1200 years ago. The Haisla Nation continues to use, occupy and rely on the lands, water, and resources of its Territory for sustenance, culture and cultural heritage.

Exhibit D80-22-04, pp. 6 and 13

36. Haisla Nation Territory includes the Kitimat River Valley, Kitimat River Estuary, Kitimat Arm, Kildala Arm, Douglas Channel, Kemano, and Gardner Canal. The Haisla Nation has 19 Indian reserves, with many of them concentrated at the head of Kitimat Arm. The locations of the Kitimat Arm area reserves relative to the proposed project are set out in NG's map at Exhibit B182-17. The Haisla Nation has approximately 1700 members with approximately 640 members living on Kitamaat IR No. 2, and another approximately 750 living in Kitimat or Terrace. The remaining members of the Haisla Nation members live on other reserves or in other areas of the Province or the country.

Exhibit B182-17
Exhibit D80-51-2, p. 70

37. The Haisla Nation's Territory is depicted on a number of maps that have been filed as evidence in these proceedings.

Exhibit D80-22-4, p. 11
Exhibit E9-6-26, p. 2

38. In addition, the Haisla Nation has filed a place name map which shows watersheds, Haisla Nation reserves and Haisla Nation place names, as well as *wa'wais* and trapline ownership information.

Exhibit 80-23-4

39. Haisla Nation aboriginal title can only be understood within the context of the Haisla traditional law (Haisla *nuyem*) and the Haisla Nation land ownership concepts of *wa'wais* and *bagwaiyas*.

40. A *wa'wais* is a watershed that is a heritable territory. *Wa'wais* means "mountain" and a *wa'wais* normally includes all of the valleys and the foothills within a ridge of surrounding mountains. A *wa'wais* typically comprises an entire watershed area and extends to its

upland headwaters. Haisla Nation Territory currently contains 54 Haisla *wa'wais*. Ownership of each *wa'wais* attaches to a particular traditional Haisla name.

Exhibit D80-24-3, p. 1
Exhibit D80-23-4

41. Each of these Haisla names carries with it certain prerogatives. For example, a name could carry with it the right to wear particular regalia and crest symbols, or the right to particular dances and songs. These names and the property rights associated with them have been passed down from generation to generation for untold millennia.

42. The traditional Haisla concept of ownership, as it relates to a Haisla *wa'wais*, includes the following privileges and obligations:

- entrance to and use of resources within a *wa'wais* requires the permission of the owner;
- strict rules provide for discipline of trespassers and poachers on the *wa'wais*;
- the resources from the *wa'wais* are dispensed at the discretion of the *wa'wais* holder;
- there is an obligation of stewardship which requires the *wa'wais* holder to avoid harm or depletion of the resources in the *wa'wais*;
- the *wa'wais* is inalienable in the sense that traditionally it could only be transferred by inheritance.

Exhibit D80-24-8, pp. 2-3
Exhibit D80-24-9, pp. 2-3
Exhibit D80-22-4, pp. 22-24 and 26-28

43. Thus, at Haisla law (*nuyem*), a *wa'wais* is exclusively held and occupied by a particular Haisla clan. The ownership of each of these Haisla *wa'wais* areas has been documented genealogically. The traditional and contemporary use and occupation of each *wa'wais* has also been recorded. Haisla place names have been identified within each *wa'wais*. There are Haisla myths, legends and folklore narratives that attach to each area.

Exhibit D80-24-8 p. 4
Exhibit D80-24-9, p. 3
Exhibit D80-22-4, pp. 14-16

44. A second and important form of the traditional Haisla property system is the *bagwaiyas*. This translates to "the place where we harvest the things that we need". A *bagwaiyas* is an area within Haisla Nation Territory that is rich in one or more important resources, and use is permitted to all members of the Haisla Nation. In some cases, *bagwaiyas* areas are surrounded by other *wa'wais* boundaries, but the *bagwaiyas* areas are commonly owned by all Haisla people; they are not passed, by inheritance, from one owner to another as *wa'wais* are. Their common ownership by Haisla people generally has been a constant throughout their history.

Exhibit D80-24-8, p. 4
Exhibit D80-24-9, p. 3
Exhibit D80-22-4, pp. 23 and 27

45. The Haisla Nation's concepts of *nuyem*, *wa'wais*, and *bagwaiyas* are components of Haisla Nation governance and its relationship to its Territory. This relationship requires the Haisla Nation to act as a steward in its Territory and to, in the context of this stewardship, ensure that the lands, water, and resources of the Haisla Nation Territory are protected for future generations of Haislas.

    Affidavit of Chief Councillor Ellis Ross, Exhibit D80-24-2, pp. 1-2, paras. 4-7
    Exhibit D80-22-4, pp. 22-2 and 26-28

46. With all three aspects of the proposed project in Haisla Nation Territory, the Haisla Nation stands to be impacted more heavily by the project than any other intervenor. The proposed pipeline route passes through the Kitimat River Valley, will require numerous watercourse crossings in Haisla Nation Territory, and terminates on the west side of Kitimat Arm directly across from the main Haisla residential reserve, Kitamaat IR No. 2. The tank and marine terminal are to be located on lands exclusively used and occupied by the Haisla Nation since well before 1846. The Haisla Nation has its own aspirations for the use of this land. The tankers which will bring condensate in and ship oil out will ply the waters of Haisla Nation Territory, waters that are heavily relied on by Haisla Nation members for sustenance and cultural identity.

47. The Haisla Nation asserts aboriginal title to and aboriginal rights throughout its Territory. These must be considered both in terms of the environmental assessment for the proposed project and in the assessment of whether the proposed project is in the Canadian public interest.

48. In addition, the Haisla Nation has recently purchased a fee simple interest from Alcan in two district lots along the west side of Kitimat Arm – district lots 99 and 309 (the Haisla has not filed evidence of this purchase as it has only transpired recently). The Haisla Nation will therefore be impacted not only as an aboriginal title holder, but also as a fee simple title holder to some of the lands to which it asserts aboriginal title.

49. The Government of Canada has made it clear through its oral evidence that it is relying on the JRP to:

    - collect and summarize the information provided by Aboriginal groups about their aboriginal rights;
    - set out how information placed onto the record by Aboriginal groups has been considered;
    - determine whether NG's evidence is accurate; and
    - set out how the proposed project will impact aboriginal rights and whether these impacts can be appropriately mitigated.

    Mr. O'Gorman, Transcript Vol. 174, lines 26892, 26694, 26764 and 26804

50. This section of the Haisla Nation's written argument sets out the law applicable to aboriginal rights and summarizes for the Panel the Haisla Nation's evidence on its aboriginal rights, including aboriginal title to the lands required for the proposed terminal and pipeline. It also sets out how the proposed project will impact those rights, whether

NG's evidence demonstrates that it has understood and addressed the Haisla Nation's concerns, and how the Panel ought to consider the Haisla Nation's evidence in its recommendations. This section refers to and relies on specific excerpts from the Haisla Nation's evidence. The Panel should review all of the Haisla Nation evidence, however, to gain a thorough understanding of who the Haisla Nation is and how the proposed project will affect the Haisla Nation.

2. Aboriginal Rights

51. The context for the evidence submitted by the Haisla Nation cannot be fully appreciated without an understanding of aboriginal rights and their place under the Canadian Constitution and in the Canadian legal framework. Aboriginal rights are rights to engage in certain activities that are held by aboriginal people as a communal group, pursuant to the integral role these activities play in the culture of the group holding the right. An authoritative definition of aboriginal rights is found in Chief Justice Lamer's decision in *R.* v. *Van der Peet*:[9]

> In order to be an aboriginal right an activity must be an element of a practice, custom or tradition integral to the distinctive culture of the Aboriginal group claiming the right.
> . . .
> In order to be integral a practice, custom or tradition must be of central significance to the aboriginal society in question.

52. The *Van der Peet* decision also provides some guidelines in determining the existence and scope of an aboriginal right:

- The practice must have been integral to the culture prior to contact with European society.
- Incidental or occasional activities do not qualify. Nor do aspects of an aboriginal society that are true to every society.
- The scope and content of the aboriginal right must be determined on a case by case basis.

53. An example of an aboriginal right is the aboriginal right of the Musqueam to fish for food, social and ceremonial purposes, as confirmed in *R.* v. *Sparrow*.[10]

54. The courts have recognized a host of aboriginal rights, such as the right to fish for food,[11] the right to fish for limited commercial purposes,[12] and the right to hunt.[13] There may also be aboriginal rights to use areas for spiritual activities, the right to gather, the

[9] *R.* v. *Van der Peet*, [1996] 2 S.C.R. 507 [*Van der Peet*].
[10] *R.* v. *Sparrow*, [1990] 1 S.C.R. 1075 [*Sparrow*].
[11] *R.* v. *Adams*, [1996] 3 S.C.R. 101 [*Adams*].
[12] *R.* v. *Gladstone*, [1996] 2 S.C.R. 723 [*Gladstone*].
[13] *R.* v. *Powley*, [2003] 25 S.C.R. 207, 2003 SCC 43 [*Powley*].

right to move goods for trade purposes, and the right to self-government. The existence, scope and nature of aboriginal rights will turn on the unique history of each First Nation.

55. In *Mitchell* v. *M.N.R.*,[14] the Supreme Court of Canada examined a claimed right to bring goods across the St. Lawrence River for the purposes of trade. The Court decided that the claimant was not able to provide enough evidence supporting the existence of this right. Chief Justice McLachlin summarized the nature of aboriginal rights as follows:

> Stripped to essentials, an aboriginal claimant must prove a modern practice, tradition or custom that has a reasonable degree of continuity with the practices, traditions or customs that existed prior to contact. The practice, custom or tradition must have been 'integral to the distinctive culture' of the aboriginal peoples, in the sense that it distinguished or characterized their traditional culture and lay at the core of the peoples' identity. It must be a 'defining feature' of the aboriginal society, such that the culture would be 'fundamentally altered' without it. It must be a feature of 'central significance' to the peoples' culture, one that 'truly made the society what it was.' This excludes practices, traditions and customs that are only marginal or incidental to the aboriginal society's cultural identity, and emphasizes practices, traditions and customs that are vital to the life, culture and identity of the aboriginal society in question.[15]

56. The courts assess the existence of an aboriginal right on a case-by-case basis, and then typically only when such a right is claimed to be infringed. The majority of the decisions that address and assess the existence of aboriginal rights arise in the provincial courts after an aboriginal person exercises his or her asserted right and is charged criminally or administratively. For example, numerous prosecutions under the *Fisheries Act*,[16] and its *Regulations* have created a body of caselaw dealing with the aboriginal right to fish.

57. Aboriginal rights are not limited to the way those rights were expressed at the time of sovereignty or contact. In *R v. Gladstone,*[17] the Supreme Court of Canada found the Heiltsuk Nation has an aboriginal right to engage in the commercial trade of herring roe. The trade in herring roe on kelp was found to have been a central and significant part of Heiltsuk society. The aboriginal right was not limited to trade with the Heiltsuk's pre-contact trading partners, but was found to have a modern manifestation which included trade in general.

58. The modern activity must be "the same sort of activity, carried on in the modern economy by modern means" as a traditional practice.[18]

59. Prior to their constitutional protection in 1982, Aboriginal rights could only be extinguished by the federal government, and then only if there is a clear and plain intention on the part of the government to extinguish the right.

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[14] *Mitchell* v. *M.N.R.*, [2001] 1 S.C.R. 911, 2001 SCC 33 [*Mitchell*].
[15] *Mitchell, supra*, para. 12.
[16] *Fisheries Act*, R.S.C. 1985, c. F-14.
[17] *Gladstone, supra*.
[18] *R. v. Marshall; R. v. Bernard*, [2005] 2 S.C.R. 220; 2005 SCC 43, para. 25 [*Marshall*].

60. In 1982, aboriginal rights were afforded constitutional protection. Section 35(1) of the *Constitution Act, 1982* reads:

> **Recognition of existing Aboriginal and treaty rights—The existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed.**[19]

61. As such, they are protected. If they are interfered with, or infringed, the infringement must be justified. An unjustified infringement of aboriginal rights would be unconstitutional and thus illegal (being beyond the Crown's constitutional jurisdiction).[20] It is difficult to contemplate any extinguishment of aboriginal rights as being constitutionally possible.[21]

62. The Supreme Court of Canada in *Sparrow* set out the definitive test for *prima facie* interference with an aboriginal right and the justification of such interference. The *Sparrow* test requires that the following questions be asked:

    1. Does the legislation in question have the effect of *prima facie* interfering with an existing aboriginal right?

        a. What are the characteristics or incidents of the rights at stake?

        b. Is the limitation on that right reasonable?

        c. Does the limitation impose undue hardship?

        d. Does the limitation deny the users their preferred means of exercising the right?

    2. If *prima facie* interference is found, is that interference justified? In other words, is the interference a legitimate regulation of a constitutional aboriginal right?

        a. Is there a valid legislative objective?

        b. If the objective is valid, is the nature and extent of infringement justified?

63. The onus of proving infringement is on the First Nation claiming the right. The onus of showing that the infringement is justified is on the Crown. The test for justification of infringement is an onerous one, requiring a valid legislative object and the ability to demonstrate that there has been as little infringement as possible in order to effect the desired result; whether, in a situation of expropriation, fair compensation is available; and, whether the Aboriginal group in question has been consulted with respect to measures being implemented.[22]

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[19] *Constitution Act*, 1982, R.S.C. 1985, App. II, No. 4.4.
[20] *Sparrow*, *supra*, para. 71.
[21] *Sparrow*, *supra*, para. 44.
[22] *Sparrow, supra*, para. 81-82.

64. In *William* v. *BC*,[23] the BC Court of Appeal recognized Tsilhqot'in aboriginal rights and characterized this recognition as yielding in result the prevention of incompatible uses of the land.

> In considering Aboriginal title and Aboriginal rights, the Court must take into account Aboriginal perspective as well as that of the common law. The connection of the Tsilhqot'in Nation to its traditional territory has both spiritual and temporal aspects that are difficult to convey in the dry words of a judgment. This deep connection must, however, remain foremost in the Court's mind in considering issues of Aboriginal title and Aboriginal rights. I am not convinced that the relationship of the Tsilhqot'in people to the land requires recognition of title on a territorial basis; it does, however, require the Court to affirm the existence of Aboriginal rights that respect the Tsilhqot'in perspective on its own culture and values. The recognition of such rights will serve to prevent incompatible uses of the land.[24]

3. Aboriginal Title – Concept and Content

65. Aboriginal title is an aboriginal right to the land itself. The Haisla Nation asserts aboriginal title to the land that NG proposes to use for its marine terminal and for its pipeline. Aboriginal title carries with it a right to choose the use to which the land is put. The Haisla Nation has not chosen to use its aboriginal title lands for the proposed project. If this project is built, it will be imposed upon the Haisla Nation in violation of the Haisla Nation's choice of use for those lands.

66. Aboriginal title is a collective aboriginal right to land itself. It is predicated in exclusive pre-sovereignty use and occupation of the land by the aboriginal claimants, inherently recognized in the *Royal Proclamation of 1763*.[25]

67. In *Delgamuukw* v. *British Columbia,*[26] Chief Justice Lamer described the content of aboriginal title:

> … the content of aboriginal title can be summarized by two propositions: first, that aboriginal title encompasses the right to exclusive use and occupation of the land held pursuant to that title for a variety of purposes, which need not be aspects of those aboriginal practices, customs and traditions which are integral to distinctive aboriginal cultures; and second, that those protected

[23] *William* v. *British Columbia*, 2012 BCCA 285; under appeal to SCC, date for hearing set Nov. 7, 2013 [*William*].
[24] *William, supra*, para. 233.
[25] *Royal Proclamation of 1763*, issued by King George III on October 7, 1763: "And We do further declare it to be Our Royal Will and Pleasure, for the present as aforesaid, to reserve under our Sovereignty, Protection, and Dominion, for the use of the said Indians, all the Lands and Territories not included within the Limits of Our said Three new Governments, or within the Limits of the Territory granted to the Hudson's Bay Company, as also all the Lands and Territories lying to the Westward of the Sources of the Rivers which fall into the Sea from the West and North West as aforesaid.
And We do hereby strictly forbid, on Pain of our Displeasure, all our loving Subjects from making any Purchases or Settlements whatever, or taking Possession of any of the Lands above reserved, without our especial leave and Licence for that Purpose first obtained."
[26] *Delgamuukw* v. *British Columbia*, [1997] 3 S.C.R. 1010 [*Delgamuukw*].

> uses must not be irreconcilable with the nature of the group's attachment to that land.[27]

68. The *sui generis* nature of aboriginal title informs its content and the extent to which aboriginal title may, in some circumstances, be infringed. In discussing infringement and the manner in which infringement may be justified, Chief Justice Lamer stated:

> The manner in which the fiduciary duty operates with respect to the second stage of the justification test -- both with respect to the standard of scrutiny and the particular form that the fiduciary duty will take -- will be a function of the nature of aboriginal title. Three aspects of aboriginal title are relevant here. First, aboriginal title encompasses the right to **exclusive** use and occupation of land; second, aboriginal title encompasses **the right to choose** to what uses land can be put, subject to the ultimate limit that those uses cannot destroy the ability of the land to sustain future generations of aboriginal peoples; and third, that lands held pursuant to aboriginal title have an inescapable **economic component** (emphasis added).[28]

69. Thus aboriginal title encompasses the right to choose to what uses the land can be put, subject to the ultimate limit that those uses cannot destroy the ability of the land to sustain future generations of aboriginal people.

70. The most recent British Columbia decision addressing aboriginal title, *William*, *supra*, provides additional insight into the content of aboriginal title and the nature of protection afforded to aboriginal rights. In justifying the limited extent of lands to which a First Nation may be able to prove aboriginal title compared to areas over which it exercised specific aboriginal rights, the BC Court of Appeal identified aboriginal title with "exclusive possession of those places that it traditionally occupied on a regular and intensive basis" and "the opportunity to live where it lived traditionally, and to continue to use the land that it cultivated or intensively took resources from."[29]

71. These aspects of aboriginal title are critical in the context of the proposed project. The Haisla Nation has not chosen to have its aboriginal title lands used for a terrestrial and marine oil and condensate terminal, or for oil and condensate pipelines. The Haisla Nation has other aspirations for the use of these lands.

72. Not only is the use of these lands proposed by NG incompatible with the use of the particular lands they will impact, it is also inherently incompatible with Haisla Nation stewardship obligations for its entire Territory.

4. The Test for Aboriginal Title

73. The test for aboriginal title was set out by the Supreme Court of Canada in *Delgamuukw:*

> In order to make out a claim for aboriginal title, the Aboriginal group asserting title must satisfy the following criteria: (i) the land must have been

[27] *Delgamuukw*, *supra*, para. 117.
[28] *Delgamuukw*, *supra*, para. 166.
[29] *William, supra*, para. 231.

> occupied prior to sovereignty, (ii) if present occupation is relied on as proof of occupation pre-sovereignty, there must be a continuity between present and pre-sovereignty occupation, and (iii) at sovereignty, that occupation must have been exclusive.[30]

74. Thus, the following must be established by an Aboriginal group seeking to prove its aboriginal title: the party asserting the right must show that it had exclusively occupied the land in question prior to the assertion of British sovereignty. In other words, it had to show that it occupied the land before 1846 (the deemed date of sovereignty in British Columbia), and that this occupation was exclusive. The Aboriginal group could have shared occupation with another Aboriginal group and still make out aboriginal title, as long as this shared occupation was exclusive.

75. In *Marshall*, *supra*, Chief Justice McLachlin shed some additional light on the requirement for exclusive occupation that was delineated in *Delgamuukw*:

> All that is required is demonstration of effective control of the land by the group, from which a reasonable inference can be drawn that it could have excluded others had it chosen to do so… This is what is meant by the requirement of aboriginal title that the lands have been occupied in an exclusive manner.[31]

76. The Court also noted that present occupation could be relied upon as proof of occupation at sovereignty, if the Aboriginal groups could show continuity between present occupation and pre-sovereignty occupation. The Haisla Nation can show both exclusive use and occupation of its Territory prior to sovereignty and present occupation with continuity between present occupation and pre-sovereignty occupation of its Territory.

4.1 Proper Rights Holder

77. Recent litigation involving assertions of aboriginal rights and aboriginal title has entailed defining who the proper rights holder is. Aboriginal title is a communal right held by a group of people on the basis of their attachment to land. The test for aboriginal title relies on exclusive occupation at sovereignty, so the identity of the rights holders at sovereignty and their relationship to current claimants is relevant.

78. In *Delgamuukw*, Chief Justice Lamer wrote:

> … As I said in *Adams*, a claim to title is made out when a group can demonstrate "that their connection with the piece of land . . . was of a central significance to their distinctive culture" (at para. 26).
>
> Although this remains a crucial part of the test for aboriginal rights, given the occupancy requirement in the test for aboriginal title, I cannot imagine a situation where this requirement would actually serve to limit or preclude a title claim. The requirement exists for rights short of title because it is necessary to distinguish between those practices which were central to the

[30] *Delgamuukw, supra*, para. 143.
[31] *Marshall, supra,* para. 65.

> culture of claimants and those which were more incidental. However, in the case of title, it would seem clear that any land that was occupied pre-sovereignty, and which the parties have maintained a substantial connection with since then, is sufficiently important to be of central significance to the culture of the claimants. As a result, I do not think it is necessary to include explicitly this element as part of the test for aboriginal title.[32]

79. In the subsequent Supreme Court of Canada decision in *Marshall*, *supra,* Chief Justice McLachlin added the following:

> The requirement of continuity in its most basic sense simply means that claimants must establish they are right holders. Modern-day claimants must establish a connection with the pre-sovereignty group upon whose practices they rely to assert title or claim to a more restricted aboriginal right.[33]

80. In *R.* v *Powley*,[34] the Supreme Court of Canada undertook a two stage process to identity the proper rights holder. First, the Court identified the historic community that exercised the right. Then the Court identified the contemporary rights bearing community.

81. Most recently, in *Tsilhqot'in Nation* v. *British Columbia*,[35] Vickers J. canvassed the caselaw on the proper claimant group for an aboriginal title claim, and stated:

> I conclude that the proper rights holder, whether for Aboriginal title or Aboriginal rights, is the community of the Tshilhqot'in people. Tsilhqot'in people were the historic community of people sharing language, customs, traditions, historical experience, territory and resources at the time of first contact and at sovereignty assertion.[36]

82. In summary, then, the proper rights holder is the Haisla Nation, the community that has maintained a substantial connection to the lands occupied at sovereignty. In the case of the Haisla Nation, present members trace their attachment and entitlement to the Territory through Haisla *nuyem* and through the concepts of *wa'wais* and *bagwaiyas*, discussed in greater detail below.

4.2 Use and Occupation

83. The concept of occupation required to support a claim of aboriginal title is different from the common law sense of occupation. It is a *sui generis* form of occupation that incorporates aboriginal concepts of use and occupation.

84. In *Delgamuukw*, the Court recognized occupation as including activities that ranged from:

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[32] *Delgamuukw, supra*, paras. 150-151.
[33] *Marshall, supra*, para. 67.
[34] *R.* v. *Powley*, *supra*.
[35] *Tsilhqot'in Nation* v. *British Columbia*, 2007 BCSC 1700 [*Tsilhqot'in*] (the lower court decision in *William, supra*).
[36] *Tsilhqot'in, supra,* para. 470.

> … the construction of dwellings through cultivation and enclosure of fields to regular use of definite tracts of land for hunting, fishing or otherwise exploiting its resources ….[37]

85. The most recent British Columbia decision to examine the requirements for demonstrating aboriginal title is the BC Court of Appeal decision in *William, supra.* This decision is under appeal to the Supreme Court of Canada.

86. At trial, Vickers J. concluded that the claimants could establish aboriginal title to some areas of their territory, using the following analysis:

> The entire body of evidence in this case reveals village sites occupied for portions of each year. In addition, there were cultivated fields. These fields were not cultivated in the manner expected by European settlers. Viewed from the perspective of Tsilhqot'in people the gathering of medicinal and root plants and the harvesting of berries was accomplished in a manner that managed these resources to insure their return for future generations. These cultivated fields were tied to village sites, hunting grounds and fishing sites by a network of foot trails, horse trails and watercourses that defined the seasonal rounds. These sites and their interconnecting links set out definite tracts of land in regular use by Tsilhqot'in people at the time of sovereignty assertion to an extent sufficient to warrant a finding of Aboriginal title as follows: [description of portions of claimed territory].[38]

87. The decision was appealed and the appeals of both the Crown and the plaintiff were dismissed. Notably, the BC Court of Appeal made opposite findings to those of the trial judge on the question of whether the plaintiff had made out its aboriginal title claim. The "postage stamp" approach to aboriginal title put forward by the Crown and rejected by the trial judge was resurrected. The Court of Appeal found that the plaintiff had not established a sufficient level of occupation to support a territorial-based claim of aboriginal title. Further, the Court of Appeal commented on the areal extent of aboriginal title that can be claimed, given the requirement for reconciliation between the rights of Aboriginal groups and the sovereignty of the Crown.

88. Mr. Justice Groberman wrote for the unanimous Court (consisting of a three-member panel including Madam Justice Levine and Mr. Justice Tysoe):

> Indeed, the plaintiff's often repeated statement that the Tsilhqot'in did not lead a ''postage stamp'' existence underlines the territorial nature of the claim – with a few exceptions, there are no definite tracts of land that were habitually occupied by the Tsilhqot'in at and around 1846.
>
> I also agree with the defendants that a territorial claim for Aboriginal title does not meet the tests in *Delgamuukw* and in *Marshall; Bernard*. Further, as I will attempt to explain, I do not see a broad territorial claim as fitting within the purposes behind s. 35 of the *Constitution Act, 1982* or the rationale for the common law's recognition of Aboriginal title. Finally, I see broad territorial

[37] *Delgamuukw, supra*, para. 149.
[38] *Tsilhqot'in, supra,* para. 959.

> claims to title as antithetical to the goal of reconciliation, which demands that, so far as possible, the traditional rights of First Nations be fully respected without placing unnecessary limitations on the sovereignty of the Crown or on the aspirations of all Canadians, Aboriginal and non-Aboriginal.[39]

89. The BC Court of Appeal has justified its narrower view of the areas to which an Aboriginal group can claim aboriginal title by referring to reconciliation:

> It seems to me that this view of Aboriginal title and Aboriginal rights is fully consistent with the case law. It is also consistent with broader goals of reconciliation. There is a need to search out a practical compromise that can protect Aboriginal traditions without unnecessarily interfering with Crown sovereignty and with the well-being of all Canadians. As I see it, an overly-broad recognition of Aboriginal title is not conducive to these goals. Lamer C.J.C.'s caution in *Delgamuukw* that ''we are all here to stay'' was not a mere glib observation to encourage negotiations. Rather, it was a recognition that, in the end, the reconciliation of Aboriginal rights with Crown sovereignty should minimize the damage to either of those principles.[40]

90. The Court of Appeal examined previous Supreme Court of Canada decisions[41] and found these to be consistent with the rejection of a territorial-based aboriginal title claim.

91. With respect to the test required to prove aboriginal title, the BC Court of Appeal concluded that "title must be claimed on a site-specific basis, and that a certain regularity and intensity of presence is needed before it will count as 'occupancy'".[42]

92. With respect to this occupancy requirement, the Court wrote:

> Aboriginal title must be proven on a site-specific basis. A title site may be defined by a particular occupancy of the land (e.g., village sites, enclosed or cultivated fields) or on the basis that definite tracts of land were the subject of intensive use (specific hunting, fishing, gathering, or spiritual sites). In all cases, however, Aboriginal title can only be proven over a definite tract of land the boundaries of which are reasonably capable of definition.[43]

93. Elaborating further on how this site-specific approach can be reconciled with the Supreme Court of Canada decision in *Delgamuukw*, the Court of Appeal wrote:

> … the examples of title lands given at para. 149 of *Delgamuukw* are well-defined, intensively used areas. The reference to hunting, fishing and other resource extraction activities is coupled with a specific description of the lands so used as ''definite'' tracts of land. I agree with British Columbia's assertion that what was contemplated were specific sites on which hunting, fishing, or resource extraction activities took place on a regular and intensive

[39] *William, supra,* paras. 218-219.
[40] *William, supra*, para. 239.
[41] *Delgamuukw*, *supra*; *Marshall , supra;* and *R.* v. *Sappie*r; *R.* v. *Gray*, [2006] 2 S.C.R. 686, 2006 SCC 54.
[42] *William, supra,* para. 225.
[43] *William, supra*, para. 230.

> basis. Examples might include salt licks, narrow defiles between mountains and cliffs, particular rocks or promontories used for netting salmon, or, in other areas of the country, buffalo jumps.[44]
>
> …
>
> Finally, with respect to *Delgamuukw*, I note Lamer C.J.C.'s comments at paras. 150 and 151 dealing with the need for a group to demonstrate that a piece of land was of central significance to their distinctive culture. He considered this to be a ''crucial'' part of the test for Aboriginal title, but found that it was unnecessary to treat it as a specific element of the proof of title, because any land that met the other criteria for Aboriginal title would, of necessity, be of central significance to the culture. That position is a sensible one if the occupation needed to found a claim for title is site-specific; it is not, however, if undifferentiated land within a large territory is to be included in a title claim.[45]

94. The requirement to demonstrate exclusive use and occupation enunciated in *Delgamuukw* is not altered by the BC Court of Appeal decision in *William*. The *William* decision, however, suggests a higher threshold of site-specific intensive use and occupation must be met to support an aboriginal title claim.

95. The Haisla Nation asserts a site-specific use intensity that is sufficient to meet the higher threshold proposed by the BC Court of Appeal in *William* in relation to the area to which it claims aboriginal title. Unlike the Tsilhqot'in people, who were described by the BC Court of Appeal as "a loosely-organized semi-nomadic group", the Haisla Nation occupied specific village sites and engaged in regular use of each *wa'wais* and *bagwaiyas* in its Territory.

96. In the alternative, if the requisite intensity of presence cannot be established over the entire Haisla Nation Territory, it can certainly be established over those portions of Haisla Nation Territory sought to be used by the proponent for the proposed project.

97. Further, in assessing the Haisla Nation's strength of claim, the use of the Territory must be viewed from the Haisla perspective. Chief Justice Lamer stated in *Delgamuukw:*

> … the source of aboriginal title appears to be grounded both in the common law and in the aboriginal perspective on land; the latter includes, but is not limited to, their system of law.[46]

98. And:

> As a result, if, at the time of sovereignty, an aboriginal society had laws in relation to land, those laws would be relevant to establishing the occupation of lands which are the subject of a claim of aboriginal title. Relevant laws might

[44] *William, supra*, para. 221.
[45] *William, supra*, para. 223.
[46] *Delgamuukw, supra,* para. 147.

> include, but are not limited to, a land tenure system or laws governing land use.[47]

99. The Haisla Nation governed and governs itself according to its own laws. The Haisla Nation administers its territorial land holding under its *nuyem* (Haisla law) pursuant to a matrilineal land transmission process that encapsulates the Haisla Nation's stewardship obligations to its Territory. The details of Haisla *nuyem*, along with Haisla land holding concepts of *wa'wais* and *bagwaiyas* are set out below.

4.3 Exclusivity of Occupation

100. In *Delgamuukw*, the Court discussed the concept of exclusive occupation in the following way:

> Finally, at sovereignty, occupation must have been exclusive. The requirement for exclusivity flows from the definition of aboriginal title itself, because I have defined aboriginal title in terms of the right to exclusive use and occupation of land. Exclusivity, as an aspect of aboriginal title, vests in the aboriginal community which holds the ability to exclude others from the lands held pursuant to that title.[48]

And:

> As with proof of occupation, proof of exclusivity must rely on both the perspective of the common law and the aboriginal perspective, placing equal weight on each.[49]

101. The exclusivity of occupation by the Haisla Nation is therefore informed not only by the common law concept of exclusivity, but also by the Haisla Nation's own concept of exclusive occupation.

102. The Haisla Nation has submitted a report prepared by its expert, Dr. Powell, titled *Stewards of the Land … Haisla Ownership and Use of their Territory, and their Concerns regarding the Northern Gateway Project and Proposed Tanker Traffic in Douglas Channel and Kitimat Arm* ("*Stewards"*) (Exhibit D80-22-4), which provides information about the Haisla Nation's past and current use and occupation its Territory, including the proposed pipeline right-of-way ("ROW"), the proposed terminal site and the proposed tanker route. *Stewards* includes the Haisla Nation perspectives on exclusive occupation, as well as specific examples of Haisla Nation actions to defend its Territory and of granting permission to others to access resources in Haisla Nation Territory. The Affidavit of Chief Councillor Ellis Ross details the Haisla Nation's actions to protect its aboriginal rights and title.

> *Exhibit D80-22-4, pp. 20, 53, 148 and 253*
> *Exhibit D80-24-2 to D80-24-11, Affidavit of Chief Councillor Ellis Ross*

[47] *Delgamuukw, supra,* para. 148.
[48] *Delgamuukw, supra,* para. 155.
[49] *Delgamuukw, supra,* para. 156.

103. In addition, the Haisla Nation has amassed historic documents that corroborate Haisla oral history and the assertions of Haisla members to the use and occupation of the Haisla Nation Territory.

Exhibits D80-25-3 to D80-25-38 and D80-26-2 to D80-26-50

5. Constitutional Protection of Aboriginal Rights

104. The *Sparrow*, *Van der Peet* and *Delgamuukw* decisions confirm that aboriginal rights and title exist in Canada unless they have been extinguished by a clear and plain intention of the Crown. These rights must still be proven on a case-by-case basis, however, in order for an Aboriginal group to establish that it actually holds aboriginal title or an aboriginal right to engage in a certain activity.

105. Aboriginal title is an aboriginal right, and is therefore accorded the same protection as other aboriginal rights under s. 35(1) of the *Constitution Act, 1982*. Any interference with aboriginal title must be analyzed in accordance with the *Sparrow* test.

106. The protection of aboriginal rights under s. 35(1) of the *Constitution Act, 1982* means that the honour of the Crown is engaged even when the right has not yet been established through litigation or Treaty. As a result, the Crown must consult with aboriginal people prior to taking actions which may infringe asserted aboriginal rights. [50]

6. The Crown's Duty to Consult

107. Given the constitutional protection afforded to aboriginal rights, the Supreme Court of Canada has determined that "when the Crown has knowledge, real or constructive, of the potential existence of the Aboriginal right or title and contemplates conduct that might adversely affect it",[51] the Crown has an obligation to consult with, and where appropriate accommodate, potentially affected Aboriginal groups.

108. This obligation to consult is grounded in the principle of reconciliation of prior existing Aboriginal groups with the assertion of Crown sovereignty. The Haisla Nation has been seeking reconciliation with Crown sovereignty for many years now. As this process continues, it is important to ensure that the subjects of that reconciliation, the Haisla Nation's aboriginal title and aboriginal use rights, are not impaired to such a degree that reconciliation becomes impossible and the constitutional protection afforded to aboriginal rights becomes an empty promise.

109. The Court differentiated between "knowledge sufficient to trigger a duty to consult and, if appropriate, accommodate, and the content or scope of the duty in a particular case",[52] and concluded that the duty to consult falls along a spectrum:

> In general terms … it may be asserted that the scope of the duty is proportionate to a preliminary assessment of the strength of the case

[50] *Haida Nation* v. *BC (MOF),* [2004] 3 S.C.R. 511, 2004 SCC 73 [*Haida Nation*]; *Taku River Tlingit First Nation* v. *British Columbia (Project Assessment Director)*, [2004] 3 S.C.R. 550, 2004 SCC 74 [*Taku River*]
[51] *Haida Nation*, *supra*, para. 35.
[52] *Haida Nation, supra*, para. 37.

> supporting the existence of the right or title, and to the seriousness of the potentially adverse effect upon the right or title claimed.[53]

And:

> … the concept of a spectrum may be helpful, not to suggest watertight legal compartments but rather to indicate what the honour of the Crown may require in particular circumstances. At one end of the spectrum lie cases where the claim to title is weak, the Aboriginal right limited, or the potential for infringement minor. In such cases, the only duty on the Crown may be to give notice, disclose information, and discuss any issues raised in response to the notice. …
>
> At the other end of the spectrum lie cases where a strong *prima facie* case for the claim is established, the right and potential infringement is of high significance to the Aboriginal peoples, and the risk of non-compensable damage is high. In such cases deep consultation, aimed at finding a satisfactory interim solution, may be required. While precise requirements will vary with the circumstances, the consultation required at this stage may entail the opportunity to make submissions for consideration, formal participation in the decision-making process, and provision of written reasons to show that Aboriginal concerns were considered and to reveal the impact they had on the decision. This list is neither exhaustive, nor mandatory for every case. The government may wish to adopt dispute resolution procedures like mediation or administrative regimes with impartial decision-makers in complex or difficult cases.
>
> Between these two extremes of the spectrum just described, will lie other situations. Every case must be approached individually. Each must also be approached flexibly, since the level of consultation required may change as the process goes on and new information comes to light. The controlling question in all situations is what is required to maintain the honour of the Crown and to effect reconciliation between the Crown and the Aboriginal peoples with respect to the interests at stake. Pending settlement, the Crown is bound by its honour to balance societal and Aboriginal interests in making decisions that may affect Aboriginal claims. The Crown may be required to make decisions in the face of disagreement as to the adequacy of its response to Aboriginal concerns. Balance and compromise will then be necessary.
>
> Meaningful consultation may oblige the Crown to make changes to its proposed action based on information obtained through consultations.[54]

110. In *Delgamuukw*, Chief Justice Lamer discussed the consultation required to justify an infringement of aboriginal title and concluded that in some instances it may require the consent of the Aboriginal group.[55]

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[53] *Haida Nation, supra*, paras. 37 & 39.
[54] *Haida Nation, supra*, paras. 43-46.
[55] *Delgamuukw, supra*, para. 168: "First, aboriginal title encompasses within it a right to choose to what ends a piece of land can be put. The aboriginal right to fish for food, by contrast, does not contain within it the same

111. The Haisla Nation exercises aboriginal rights throughout and asserts aboriginal title to its Territory. The proposed project will infringe the Haisla Nation's aboriginal rights. The Haisla Nation is prepared to prove its aboriginal rights, including its aboriginal title to those portions of its Territory which will be impacted by the proposed project.

112. The Haisla Nation has filed written evidence in this proceeding that demonstrates the strength of its claim to aboriginal rights and aboriginal title to the areas to be impacted by the proposed project. The purpose of this evidence is to inform the Panel and the Crown of the Haisla Nation's strength of claim so that the consultation that must take place if the Crown is to discharge its obligations honourably can be properly scoped.

113. Significantly, the evidence submitted by the Haisla Nation has not been challenged. NG did not seek to examine any of the expert witness authors to test this evidence. The federal government participants did not seek to leave to examine these witnesses to test their evidence either. NG did question Chief Councillor Ellis Ross, but chose to limit its cross examination to certain peripheral matters such as the LNG project being developed on the Haisla Nation's Bees IR No. 6. NG did not question Chief Councillor Ellis Ross on the extensive evidence of aboriginal rights and title set out in his affidavit, or prepared by Dr. Powell, Mr. Wolfhard or Mr. Evans and submitted by the Haisla Nation. Canada chose not to seek leave to question any of the Haisla Nation's witnesses.

114. The Haisla Nation evidence of aboriginal title stands unchallenged and uncontroverted. Neither NG nor Canada can be heard to question it. Thus it should be accorded substantial weight.

7. Haisla Nation Strength of Claim

115. The Haisla Nation asserts aboriginal title to its Territory and exercises aboriginal rights throughout its Territory. Some portions of Haisla Nation Territory will be directly affected by the construction and operation of the proposed project: the terminal site and pipeline corridor on the west side of Kitimat Arm and the pipeline corridor through the Kitimat River Valley, including a portion of the tunnel area, and the waters of Kitimat Arm and Douglas Channel. In the event of an accident or malfunction, however, additional tracts of Haisla Nation Territory may be impacted, including the main residential reserve at Kitamaat IR No. 2, numerous other reserves, the Kitimat River and its Valley, the Kitimat River Estuary, and Haisla Nation Territory that fronts on marine waterways.

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discretionary component. This aspect of aboriginal title suggests that the fiduciary relationship between the Crown and aboriginal peoples may be satisfied by the involvement of aboriginal peoples in decisions taken with respect to their lands. There is always a duty of consultation. Whether the Aboriginal group has been consulted is relevant to determining whether the infringement of aboriginal title is justified, in the same way that the Crown's failure to consult an Aboriginal group with respect to the terms by which reserve land is leased may breach its fiduciary duty at common law: *Guerin*. The nature and scope of the duty of consultation will vary with the circumstances. In occasional cases, when the breach is less serious or relatively minor, it will be no more than a duty to discuss important decisions that will be taken with respect to lands held pursuant to aboriginal title. Of course, even in these rare cases when the minimum acceptable standard is consultation, this consultation must be in good faith, and with the intention of substantially addressing the concerns of the aboriginal peoples whose lands are at issue. In most cases, it will be significantly deeper than mere consultation. Some cases may even require the full consent of an aboriginal nation, particularly when provinces enact hunting and fishing regulations in relation to aboriginal lands."

Exhibit D80-22-4, p. 11

116. The Haisla Nation has filed evidence that shows both exclusive use and occupation of its Territory at sovereignty and the exercise of aboriginal rights in its Territory at occupation, as well as ongoing and continuous use and occupation and exercise of rights. The volume of material filed is considerable, and will be only briefly touched upon here to demonstrate the Haisla Nation strength of claim. The Panel should review the evidence in its entirety to understand the extent to which the Haisla Nation's assertion of aboriginal rights and title is supported by Haisla Nation oral history, ethnographic materials, historical documentation and archaeology, leading to the inevitable conclusion that the Haisla Nation's strength of claim is extremely high.

117. The Haisla Nation asks that the Panel explicitly make a preliminary finding that the Haisla Nation's strength of claim is extremely high.

7.1 Haisla Nation Aboriginal Title – Exclusive Use and Occupation of Lands and Water

118. The Haisla Nation's evidence on the exclusive use and occupation of its lands and water is set out in the following Exhibits:

D80-22-4 and D80-22-5	*Stewards of the Land … Haisla Ownership and Use of their Traditional Territory, and their Concerns regarding the Northern Gateway Project and Proposed Tanker Traffic in the Douglas Channel and Kitimat Arm*, with supporting documentation, prepared by Jay Powell, 2011.
D80-22-6 to D80-22-9	*Haisla! We Are Our History. Our Lands, Nuyem and Stories as told by our chiefs and elders*, edited by Louise Barbetti and Jay Powell, 2005.
D80-25-3 to D80-25-38 and D80-26-2 to D80-26-50	*Historical and Documentary Corroboration Regarding the Haisla Nation's Occupation of its Traditional Territory*, with supporting documentation and trapline registration documents, prepared by Eric Wolfhard, 2011.
D80-28-2 and D80-28-3	*An analysis of Archaeological Reports registered within British Columbia's Archaeology and Heritage databases for Haisla Traditional Territory*, with a supporting table, prepared by Blake Evans, 2011.
D80-24-2 to D80-24-11	Affidavit of Chief Councillor Ellis Ross, with Exhibits.
D80-23-1	Affidavit of Michael Jacobs, Haisla Fisheries Manager.
D80-23-2 D80-23-3 D80-32-2 D80-34-2	Affidavits of Haisla Nation members: Alice Annette Smith, Andy Bolton Sr., Annie Woods, Audrey Morrison, Beatrice Gray, Belva Stewart, Bernice Wilson, Burke Jessel Norman Stewart, Caroline Merna Stewart, Cecil Charles Paul Jr., Cecil Paul Sr., Christopher Walter Wilson, Courtney Monica Smith, Cyril Russel Grant Jr., Derrick Keith Robinson, Dorothy Edna Woods, Edward Ross, Effie Grant, Elaine Ross, Elma Ross, Emily Gray, Franklin Albert Nelson, Freddy Ringham, Gail Hannah Amos, Gary Morrison Sr., Geoffery Ringham, Gerald Victor Amos, Glenda

	Morrison, Grace Ringham, Harold Stewart, Hilda Grant, James Stanton Wilson, James Starr Wilson, Jason Ringham, Joyce Paul, Kristan Wilson, Loretta Adeline Gray, Lorna Bolton, Mary Agnes Nyce, Mary Muriel Green, Mary-Ann Grant, Morris Heber Grant, Nancy Nyce, Nina Shaw, Pauline Stewart, Prescott Bolton, Randolph Charles Nyce, Raymond Green Sr., Rita Price, Roberta Vera Grant, Ronald Reece, Ronald Smith, Russell Ross Jr., Samuel M. Shaw, Sarah Shaw, Scott Stewart, Thomas Gregory Robinson, Thomas Herbert Nyce, Trevor Amos, Victoria Shaw, Viola Robinson, Wesley Steven Nyce, Willard Grant and William Wilson.
D80-23-4	Map of Haisla Nation Territory with place names.

119. This evidence supports the following key findings that are relevant to the Haisla Nations strength of claim. The Haisla Nation asks the Panel to make these findings.

7.1.1 The Haisla Nation Occupied its Territory at Sovereignty

120. The boundaries of Haisla Nation Territory and the proposed pipeline and terminal locations are shown in the map at p. 11 of *Stewards*.

Exhibit D80-22-4, p. 11

121. Haisla Nation oral history places the Haisla Nation in its Territory well before contact with settlers and before the assertion of Crown sovereignty in 1846 (the date critical for establishing aboriginal title in Canada). In addition, both Dr. Powell and Mr. Wolfhard have concluded that the Haisla Nation occupied its Territory in 1846.

- In *Stewards*, Dr. Powell concludes on the basis of Haisla Nation oral history and principles and techniques of historical linguistics that the Haisla Nation migrated to its current Territory about 1200 years ago.

  Exhibit D80-22-4, pp. 13-14

- Genealogical records associated with the Haisla Nation *wa'wais* transmissions can be traced back to prior to 1846.

  Exhibit D80-22-4, pp. 15-16, which includes genealogical diagrams for each *wa'wais*

- Haisla Nation oral history and historic ship records speak of the same first encounter between European explorers in 1793 that demonstrates Haisla Nation occupation of the area at the head of Kitimat Arm.

  Exhibit D80-22-4, p. 17
  Exhibits D80-25-3, pp. 4-6 and D80-25-37, p. 9

- Oral history of village sites is corroborated by the archaeological record. Oral history tells us that Haisla Nation IR Nos. 1, 2, 3, 5 and 6 are locations of old village sites that pre-date 1846. The archaeological record confirms the existence of old village sites here, as well as numerous additional old village and habitation sites throughout Haisla Nation Territory. One of these is on the Upper Kitimat River at *Na'labila* (GbTc-1).

Exhibit D80-22-4, pp. 8-9 and 21
Exhibit D80-22-5 and replacement document Exhibit D80-100-2, p. 4
Exhibit D80-28-2, pp. 5-6
Exhibit D80-28-3, pp. 2, 4, 6 and 10

- Culturally Modified Trees (CMTs) that date to before 1846 are found at the proposed terminal site, immediately to the south of the proposed terminal site, along both the west and east sides of Kitimat Arm, in the Kitimat River Valley and in numerous other locations throughout Haisla Nation Territory.

  Exhibit D80-25-18, p. 7
  Exhibit D80-28-2, pp. 9-10
  Exhibit D80-28-3, pp. 2 to 5 and generally
  Mr. Green, Transcript Vol. 104, lines 29769-29780

- Mr. Wolfhard has concluded on the basis of his expert review that the documented historical, anthropological and archaeological record corroborates the Haisla Nation's use and occupation of its Traditional Territory as of 1846.

  Exhibit D80-25-3, p. 3

122. The ethnographic, historic and archaeological records are consistent with and corroborate the Haisla Nation's oral history, as captured in *Stewards*, and confirm that the Haisla Nation used and occupied the lands, water, and resources in the areas of Kitimat, Kemano, Douglas Channel, Kildala Arm and Gardner Canal in 1846.

7.1.2 Haisla Nation Use and Occupation of Haisla Nation Territory

123. The Haisla Nation had and has a rich relationship to the lands, water, and resources of its Territory. The Haisla Nation relied and relies on a broad range of resources to sustain itself and its culture and cultural heritage. The extent to which the Haisla people relied and rely on the lands, water, and resources of Haisla Nation Territory is set out *Stewards*, compiled on the basis of traditional use interviews with Haisla Nation elders and other members over the course of over 15 years.

    Exhibit D80-22-4, p. 7

124. Haisla Nation members have attested to their ongoing reliance on the lands, water, and resources of their Territory. Examples include:

    > I currently fish the following resources from Haisla Territory: rock cod… black cod… ling cod… red snapper… halibut… pink salmon… coho salmon… spring salmo … winter sping salmon… chum salmon… sockeye salmon
    >
    > I current harvest the following resources from Haisla Territory: prawns… Dungeness crabs… king crabs… sea cucumbers… clams… cockles… sea urchins (green, red, purple) … chiton
    >
    > I currently hunt the following resources from Haisla Territory: moose… deer… ducks… geese … seals

> I currently gather the following resources from Haisla Territory: wild crab apples … black current… blueberries… huckleberries… elderberries… salmonberries.
>
> All of the foods I mentioned above are part of our traditions and traditional way of life.
>
> *Exhibit D80-23-2, pp. 57-60, paras. 5-9, Affidavit of Franklin Albert Nelson*
>
> The various food gatherings and harvestings are inherent traditional practices that are passed down from one generation to another. These gatherings and harvestings are a means for me to teach, educate and groom my children and grandchildren. It is the family's responsibility to pass these traditions on to our children and grandchildren and to others who may not have teachers.
> …
>
> These teachings are a part of daily Haisla life. These practices are a part of the Haisla Culture and invoke strong cultural experiences for both the family and the Haisla Elders who teach our younger generation.
> …
>
> A very significant part of our Nuyem involves sharing and distributing our resources. Doing so reinforces our Nuyem and practices by *Gya Wa Tlabb* ("helping each other").
>
> *Exhibit D80-23-3, pp. 22-23, para. 6, Affidavit of Mary Muriel Green*

7.1.2.1 Haisla Nation Perspective

125. In accordance with the findings of the Supreme Court of Canada, the aboriginal perspective, in this instance the perspective of the Haisla Nation, must be considered in an assessment of exclusivity of use and occupation. This perspective is set out largely in *Stewards*. The critical aspects of this evidence, which is unchallenged, are summarized below:

> The Haisla Nation origin story speaks to the migration of Haisla Nation ancestors into the Territory and settlement at the head of Kitimat Arm.
>
> *Exhibit D80-22-4, p. 12*
>
> The Haisla Nation is organized into a matrilineal clan based society:
>
> **3872**. Our nation is subdivided by a clan system according to your mother's line. The Beaver Clan, the Raven work together. The Eagle Clan, Fish, Salmon, and Killer Whale, each clan is headed by the chief who acts as their leader and all the directions of Jassee of the Beaver Clan. The major benefit of this system keeps history, maintains law, protects family, divides responsibility and education.
>
> *Exhibit D80-22-4, p.24*
> *Chief Jassee, Samuel Robinson, Transcript Vol. 8, line 3872*

> The clan based structure includes clan based control over lands, water, and resources in a watershed based land-holding system comprised of *wa'wais* and *bagwaiyas*. The resource areas are transmitted in accordance with Haisla Nation traditions that are considered law (Haisla *nuyem*).
>
> *Exhibit D80-22-4, pp. 22-27*
> *Exhibit D80-24-8 p. 4*
> *Exhibit D80-24-9, p. 3*
>
> The Haisla Nation has place names throughout its Territory, reflecting a level of familiarity with the Territory that demonstrates in-depth use and occupation.
>
> *Exhibit D80-22-4, p. 16*
> *Exhibit D80-23-4*
>
> The *wa'wais* and *bagwaiyas* system allows the ongoing use of lands, water, and resources while preventing their defilement and depletion.
>
> *Exhibit D80-22-4, p. 26*

126. In *Stewards*, Dr. Powell recognizes that Haisla Nation origins, history and social structure demonstrate the close relationship of the Haisla Nation to the lands, water, and resources of its Territory:

> Haisla culture is not a set of portable lifeways that could be practiced wherever a nomadic community stopped to put up their cedar plank houses or tents. Haisla habits, beliefs, myths and oral traditions, annual cycle, economics, diet and subsistence patterns all focus on the 90 x 170 km area that is their traditional territory. It was settled by their ancestors at the ''Time of Beginnings.'' For dozens of generations, it was inhabited, hunted, fished and harvested by the descendants of those first migrant settlers. And now that land where their grandfathers are buried is their ''grounds'' from which the Haisla take their sustenance and their identity. To a large extent, being Haisla has to do with Haisla traditional territory.
>
> *Exhibit D80-22-4, p. 6*

127. Haisla Nation members today still harvest and process numerous resources from Haisla Nation Territory and use the harvesting and processing as a means to teach future generations about who the Haisla are. The excerpts below are just a few that demonstrate this clearly:

> The present practice of hunting, fishing and gathering brings us to the places where family members from our ancestral past have been before us; to the places where they left the petroglyphs that remain as gestures of greeting to us, and that go to signal the continuum of our habitation of these lands. We are able to walk the same routes, wade into the same pools, climb the same mountains, to see the same beauty, to feel the same love for the light in the eyes of our children, as they play on the shores, drink of the fresh waters, and

> eat the foods and the fruits, of the land and the waters, that continue to nourish us.
>
> *Exhibit D80-34-2, p. 5, Affidavit of Thomas Gregory Robinson*
>
> Our land is our lively bond between our generations.
>
> *Exhibit D80-23-2, p. 9, Affidavit of Audrey Morrison*
>
> We connect to our people and our culture through our land. By harvesting from the land, our Elders teach our children our culture, our laws and our way life. … If we lost our land or resources because of an oil spill, I think we would lose our culture. I'm afraid that we would lose our identity.
>
> *Exhibit D80-23-2, pp. 13 and 14, Affidavit of Belva Stewart*
>
> I believe that it is our duty to keep our natural resources for future generations to harvest and hunt.
>
> *Exhibit D80-23-2, p. 70, Affidavit of Gary Morrison Sr.*
>
> The land is important to me because first of all I was born here. The land is also important because my family has lived off this land for years. Through my family and other Haislas, I have learned how to live off the land. Now as I grow older, the things I have learned have got to continue. This is our way of life, it is all that I have, it is all that I know. I'd like to use my current knowledge and continue learning and teaching my children, and others.
>
> *Exhibit D80-23-2, p. 72, Affidavit of Geoffrey Ringham*
>
> If my ability to hunt of fish were lost or compromised, it would definitely be hard to handle and hard to imagine. I cannot picture losing what we have today, that thought is hard to put into words. It would be like losing a loved one. Our land is who we are; we are like a family.
>
> *Exhibit D80-23-2, p. 86, Affidavit of Harold Stewart*
>
> I believe that to be without our traditional foods would be a catastrophe. This is a part of our history and our legacy for future generations.
>
> *Exhibit D80-23-3, p. 20, Affidavit of Mary Agnes Nyce*
>
> It scares me to think that everything we rely on to sustain us physically and culturally could be taken away from us in a matter of hours. That's not a risk I'm willing to take, for myself, or for my children, or for my grandchildren.
>
> *Exhibit D80-23-3, p. 57, Affidavit of Russell Ross Jr.*

128. In conclusion, the Haisla Nation has a matrilineal land transmission law that reflects Haisla Nation stewardship of its Territory and supports ongoing use that is consistent with these stewardship principles. It is based in the concepts of *wa'wais* and *bagwaiyas*,

resources use areas that reflect watershed boundaries and that are administered for the purpose of ensuring the ongoing viability of the resources these areas provide.

7.1.2.2 Ethnographic Evidence

129. Historic and ethnographic evidence shows a remarkable consistency with the Haisla Nation perspective on its use and occupation of its Territory. Mr. Wolfhard's expert report, *Historical and Documentary Corroboration Regarding the Haisla Nation's Occupation of its Traditional Territory*, with supporting documentation, describes the historic and ethnographic evidence that discusses the Haisla Nation and Haisla Nation Territory beginning as early as 1793 and continuing to the present.

    Exhibits D80-25-3 to D80-25-38 and D80-26-2 to D80-26-50

130. In addition, the Affidavit of Chief Councillor Ellis Ross describes the steps taken by the Haisla Nation over the course of the last 50 years to protect its lands, water, and resources from uses that are inconsistent with Haisla Nation stewardship concepts. In 1964, Haisla Nation Chief Councillor Gordon Robinson urged the municipality of Kitimat to recognize that its sewage discharge into the Kitimat River was contaminating the Haisla Nation's fishing grounds. The Haisla Nation wrote a number letters between 1990 and 2002 to Eurocan Pulp and Paper Co., the provincial government and the federal government setting out the deep and rich history that the Haisla Nation has with the Kitimat River and the effects of the effluent on culturally important aquatic wildlife. The Haisla Nation has consistently fought for the protection of its untouched temperate rainforest, the Kitlope. In 1991 the Haisla Nation outlined its sacred duty to guard and protect the land in the "Kitlope Declaration". Following the Declaration, Haisla Nation Chief Councillors repeatedly engaged the provincial and federal government with regard to appropriate preservation, protection and management of the ecosystem. More recently, the Haisla Nation has consistently placed environmental values and integrity, in keeping with its stewardship obligations, at the forefront in discussions with government and industry about resource use and development.

    Exhibits D80-24-2 to D80-24-11, Affidavit of Chief Councillor Ellis Ross

7.1.2.3 Trapline Registrations

131. The Haisla Nation recognized relatively early in its interactions with the legislative regimes brought by the colonizing government that some of the regulatory initiatives would be valuable in helping to protect its aboriginal rights and promoting the ongoing stewardship of its Territory.

132. When British Columbia brought the trapline registration system to Haisla Nation Territory, the Haisla Nation members who held *wa'wais* applied for trapline registrations over their *wa'wais* areas. Because the *wa'wais* are largely watershed based, there is a high degree of conformity between the registered traplines and the Haisla Nation *wa'wais*.

133. The detail of the trapline registrations is set out in Mr. Wolfhard's report, and the trapline registration documents have been provided as part of the Haisla Nation's written evidence.

Exhibit D80-25-3, pp. 18-24
Exhibits D80-26-2 to D80-26-50

134. The Haisla Nation trapline registrations do not displace Haisla *nuyem* and concepts of *wa'wais* and *bagwaiyas*, but rather support the ongoing use and occupation by the Haisla Nation of its Territory and corroborate the importance of Haisla *nuyem*. The registered traplines registrations are administered in a manner that is consistent with Haisla Nation *nuyem* and the Haisla Nation's *wa'wais* transmission system.

Exhibit D80-22-4, pp. 36 and 139
Exhibit D80-25-3, p. 18

7.1.2.4 Archaeological Sites

135. Haisla Nation Territory is marked by many registered archaeological sites, including village sites and habitations, middens, rock art and culturally modified trees (CMTs). Haisla oral history confirms Haisla Nation use and occupation of and attachment to these sites.

Exhibits D80-28-2 and D80-28-3
Exhibit D80-22-4, pp. 19-21

7.1.2.4.1 CMTs at the Terminal Site

136. CMTs are living monuments of aboriginal history and presence and are significant to demonstrating aboriginal use and occupancy.

Mr. Paul Anderson, Transcript Vol. 104, line 29716
Dr. Colin Buchanan, Transcript Vol. 104, line 29713

137. The proposed terminal site is home to over 800 documented CMTs. A number of these documented CMTs predate 1846, and are therefore protected under British Columbia's *Heritage Conservation Act*.[56]

Mr. Green, Transcript Vol. 104, line 29767

138. The proposed terminal site is located in the Haisla Nation's *Bisamut'is Wo'axdu wa'wais* (Trapline No.T611T006), but also in close proximity to the *Yaksda wa'wais* (Trapline No. T611T007).

Exhibit D80-23-4 and Exhibit B3-18, p. 51

139. The *Bisamut'is Wo'axdu* and *Yaksda wa'wais* are areas used by the Haisla Nation for the taking of large cedar, cedar bark, and cedar whithes, amongst a myriad of other resources.

Exhibit D80-22-4, pp. 55-59
Chief Legaix, Rod Bolton, Transcript Vol. 8, lines 3897-3921

[56] *Heritage Conservation Act* [RSBC 1996] c. 187.

7.1.2.4.2 Rock Art at the Terminal Site

140. In addition to the CMT's at the proposed terminal site, there are other significant Haisla archaeological sites near the terminal. These sites are identified by their Borden numbers FlTe 5 and FlTe 7.

Exhibit D80-28-2, p. 7

141. FlTe5 and FlTe7 are both pre-contact pictographs. NG has identified their presence and the potential for the proposed project to impact these sites.

Exhibit D80-28-3 p. 10
Exhibit B3-18, pp. 132-133

142. The red rock art paintings at *Hent'lixw* rock are associated with a Haisla Nation story relating to the defeat of Haida raiders. The other rock art site is also described by Chief Jassee, Samuel Robinson, in his oral testimony.

Exhibit D80-22-4, pp. 20 and 54
Chief Jassee, Samuel Robinson, Transcript Vol. 8, line 3855

7.1.2.5 Haisla Nation Land Claims

143. The Haisla Nation's land claims reflect the Haisla Nation's perspective on its use and occupation of and entitlement to the lands in its Territory. The record of these claims is important corroborating evidence of the Haisla Nation's perspective. Mr. Wolfhard has documented the Haisla Nation land claims. These go back as far as 1897, when the Haisla Nation petitioned the BC Commissioner of Lands and Works for protection of is crab apple patches, valuable resource lands:

> … These few patches of fruit trees produce apples not valued by white men, are now in danger of being included in Land Claims made by strangers to us, and if allowed by you and our Governor to be taken from us and destroyed by clearing of the land will generally injure us and destroy our faith and trust in the Justice and Friendship of our Government.

Exhibit D80-25-3, p. 24

144. One of the most poignant assertions of the Haisla Nation's aboriginal title is the Haisla Nation's appeal to the three-member Royal Commission on Indian Affairs in 1913. Chief John Bolton asked what had given the government the right to take the land which the Haisla Nation claimed as its own by way of ancestral right:

> We are troubled about how the Government has gone and sold the land outside our reserves. We know it is our land and not the Government's, and they have gone and sold it and done what they liked with it … We are troubled about our land. It is not straight to us somehow. It is ours because here we were born and our father and our forefathers had it before us. We want you to understand about it. We want to know how the Government got that land outside of the Reserve.

Exhibit D80-25-3, p. 33

145. Another Haisla Nation member, identified only as Amos, also questioned how the government was dealing with the Haisla Nation's land:

> This is what I wish to know. I heard about you coming here to see about this trouble of land here. There is lots of places where our forefathers had their habitation and different places where different ones of us were born. The government at Victoria put their hand down on these places and did what they liked with them. They gave us a small piece of land and they [sic] rest they sold away. We want to come before you before you cut it up. We don't want you to cut it up.

Exhibit D80-25-3, pp. 33 and 34

146. The Haisla Nation has continued to vehemently assert its aboriginal rights and aboriginal title. The Affidavit of Chief Councillor Ellis Ross includes the record of these assertions going back well over 50 years.

Exhibits D80-24-2 to D80-24-11

147. In 1978, the Haisla Nation submitted a Comprehensive Claim for consideration by the federal government, in what was a precursor process to the current BC Treaty Negotiation process. This claim was accepted for negotiation pursuant to the federal government's historic and legal validation process.

Exhibits D80-25-3, pp. 42-43 and D80-24-3, p. 8

148. The Haisla Nation is also engaged in the current BC Treaty Negotiation process from the outset, as part of its ongoing efforts at reconciliation. In that process the Haisla Nation presented a detailed treaty land selection offer to the provincial and federal governments in 2005. The Haisla Nation land selection explicitly includes the lands proposed to be used by NG for the terminal site.

Exhibit D80-24-2, p. 6 and Exhibit D80-24-3, p. 56

7.1.3 Haisla Nation Use and Occupation of its Territory was Exclusive

149. Exclusive use and occupation must be informed by both the common law and the aboriginal perspective. In *Delgamuukw*, the Supreme Court of Canada acknowledged that the common law principle of exclusive occupation is derived from the notion of fee simple ownership. As aboriginal title is *sui generis*, exclusive occupation in the context of aboriginal title must take into consideration a broader suite of concepts that can demonstrate exclusive occupation, such as the intention and capacity to retain exclusive control and the ability to grant permission to others to use the Territory.[57]

150. The fact that the Haisla Nation saw itself as exclusively occupying its Territory is demonstrated by references to defending against raids by the Haida and others. Although

[57] *Delgamuukw, supra*, para. 156.

these raids, incursions into Haisla Nation Territory, occurred, the Haisla developed a warning system and forcibly expelled raiding Haidas from its Territory.

Exhibit D80-22-4, pp. 20, 54, 148, 176, 253, 255 and 258

151. Further, the very nature of the Haisla Nation's *wa'wais* and *bagwaiyas* land holding system demonstrates Haisla Nation control of the lands, water, and resources of its Territory and necessarily excluded non-Haisla control of the lands, water, and resources of Haisla Nation Territory. Ownership of a *wa'wais* passes within a particular Haisla clan pursuant to a ceremonial name transfer that is marked by a feast where the transfer can be witnessed.

Exhibit D80-22-4, pp. 22-26

152. *Wa'wais* owners cannot dispose of their *wa'wais* in a way that would alienate the clan possession from the clan or the Haisla Nation, thus excluding others from gaining ownership of Haisla Nation Territory. This has fostered possession and proprietorship of Haisla Nation Territory that is continuous over time, and that prevents possession and proprietorship outside the Haisla Nation.

Exhibit D80-22-4, p. 24

153. The registration of traplines under the provincial trapline registration system confirms that in the minds of the Haisla, the Territory is theirs.

154. As with many aboriginal territories in British Columbia, Statement of Intent maps for treaty purposes show claims by neighbouring Aboriginal groups that overlap Haisla Nation Territory. It is not necessary to dispatch these overlapping claims for the purpose of assessing the Haisla Nation strength of claim to a significant portion of Haisla Nation lands that will be impacted by the proposed project.

155. The federal government has confirmed that there are no overlapping claims to the proposed terminal area or the pipeline along the west side of Kitimat Arm. AANDC has provided maps of Statement of Intent areas for treaty negotiation purposes for First Nations in British Columbia. A review of the maps covering Haisla Nation Territory shows potential overlaps over portions of the pipeline in the Kitimat River Valley with the Tsimshian First Nations and with the Allied Tribes of Lax Kw'alaams. There are **no overlapping claims** at the proposed terminal site or along the west side of Kitimat Arm.

Exhibits E9-6-25, p. 1; E9-6-26, p. 2; and E9-6-27, p. 4

156. In response to an Information Request from the Haisla Nation, AANDC has confirmed that no other Aboriginal group claims the land at the proposed terminal site or for portions of the pipeline along the west side of Kitimat Arm. AANDC stated, however, there may be some overlap with the Kitselas First Nation for portions of the pipeline in the lower Kitimat River Valley. AANDC has not identified a Kitselas Statement of Intent map but refers to a Treaty Agreement-in-Principle with Kitselas, which is not in evidence. A Treaty Agreement-in-Principle does not set out asserted territory but rather represents a proposed compromise of the Kitselas aboriginal rights and title claim.

Exhibit E9-21-12, p. 28

157. Kitselas has not filed written evidence in the JRP proceedings. The oral evidence provided by the Kitselas relates to harvesting of resources in Haisla Nation Territory but does not provide evidence of exclusive use and occupation of these areas. In fact, Kitselas oral evidence states that Kitselas Stewardship jurisdiction was historically centred on the Kitselas Canyon.

Mr. McKenzie, Transcript Vol. 10, lines 5270-5303

158. In summary, the Haisla Nation has provided clear and cogent evidence that it has used and occupied its Territory since before 1846, that this use and occupation was exclusive. Further this intensity of this use and occupation, governed by its own laws (*nuyem*) and *wa'wais* ownership and transmission system, supports a claim of aboriginal title to the *wa'wais* and *bagwaiyas* of Haisla Nation Territory.

7.2 Haisla Nation Aboriginal Use Rights

159. In *Stewards,* Dr. Powell identifies the resources taken from each of the *wa'wais* and the *bagwaiyas* of Haisla Nation Territory.

Exhibit D80-22-4

160. *Stewards* also includes a collection of Haisla stories going back the beginning of Haisla existence, which provide a picture of the rich range of resources the Haisla relied on: trees (cedar, spruce, hemlock, yellow cedar, douglas fir), fish (eulachon, salmon, coho, sockeye, dogfish, halibut, flounder, black cod, ling cod, trout), shellfish, game (deer, ermines, goats, grizzly bear), birds (eagles, owls, ducks), and seals.

Exhibit D80-22-4, pp. 212, 216, 220, 222, 225, 229, 230, 233, 236, 237 and 242

161. Ethnographic records confirm that the Haisla Nation fished, trapped, gathered and harvested trees and other plants prior to contact. Whidbey (of Captain Vancouver's expedition) wrote of his 1793 encounter with the Haisla that they traded fish, sea otters and other land animals. Early (pre-1846) Hudson's Bay trading records speak of the Haisla people coming to Fort Simpson by canoe to trade beaver, otter, marten, mink, deer and bear.

Exhibit D80-25-14, pp. 1 and 4
Exhibit D80-25-15, p. 4

162. The Haisla Nation's evidence supports claims of aboriginal rights to fish, hunt, trap and gather, as well as an aboriginal right to take trees. *Stewards* documents the specific *wa'wais* and *bagwaiyas* areas in which these rights were and are exercised.

163. Haisla Nation aboriginal rights are exercised in a modern manner that is consistent with the logical evolution of the exercise of these rights. Thus the way in which the Haisla Nation exercises its aboriginal rights are the modern incarnation of the ancestral method: using powerboats instead of canoes, rifles instead of bows and arrows, fishing line instead of cedar bark rope, etc.

164. Current use affidavits by Haisla Nation members confirm this ongoing use of and reliance on resources from the Territory. Examples include:

I currently process the following resources from Haisla Territory:

a. Fish – including Halibut, Red Snapper (Yelloweye Rockcod), Ling Cod and Black Cod (Sablefish) …

b. Shellfish – including clams, crabs and cockles …

c. Deer and moose …

I harvest blueberries and huckleberries, wild crab-apple, *gwathlum* (salmonberry shoots) near the Kitamaat Village for my family's personal consumption.

Exhibit D80-23-2, p.11, paras. 4 and 5, Affidavit of Beatrice Gray

During the harvesting season I and various members of our extended family continue to harvest seal, deer, moose, geese, ducks and black bear and mountain goat … There are a number of areas in our ancestral territory which are favoured harvesting sites for these animals. Among these areas but not limited to them would by *Khax Gla Lise La*, which is the Kitimat River Valley and the Kitimat Arm, Kidala and the Dala River including the estuaries, Giltoyees and Foch Lagoon area, the Gardner Canal area including Kemano River, and the Kitlope.

Exhibit D80-23-2, p.75, paras. 5 and 6, Affidavit of Gerald Victor Amos

I currently harvest the following resources from the Haisla Nation:

a. I hunt for moose and deer in to Kitamaat Valley during the fall and winter seasons …

b. I fish for salmon (Sockeye, Pink), halibut, crabs, clams, cockles, sea cucumber, prawns, cod, herring eggs, sea weed, sea urchin, and muscles at the Kitimat River, Coste Rock, Monkey Beach, Crab River, and Eagle Bay throughout the whole year …

c. I harvest elderberries, soapberries, huckleberries, wild crab apples, wild cranberries, plums, poison root, alder bark, cedar bark, yew wood, and devils club at Kitamaat Village, and Kitimat Valley during the spring and summer seasons …

Exhibit D80-23-3, pp. 69-70, para. 4, Affidavit of Victoria Shaw

165. Further affidavits of current use are located in *Exhibits D80-23-2 and D80-23-3*.

7.3 Haisla Nation Stewardship Obligations

166. The Haisla Nation operates under a stewardship obligation to its Territory. This stewardship obligation is based in the Haisla Nation relationship to the lands, water, and resources of its Territory:

Hopefully, sensitive readers will also accept that the Haisla sense of stewardship responsibility toward their land is neither trivial nor primitive. Haisla traditional ownership involves an evolved cultural institution that has

worked for centuries to specify the person responsible in each generation for protecting each watershed of Haisla traditional territory. This protection has promoted, for the most part, the continuing fecundity of the land and the vital availability of traditional foods for the Haisla.

Exhibit D80-22-4, p. 26

167. The Haisla stewardship obligation is expressed in the oral evidence provided by the Haisla Nation witnesses, and in affidavits filed by Haisla Nation members.

3911. When I got my wa'wais, my name, it was passed on to me by my late father from his mother and from his father; so that's how it works. That's how our system works. So when the name goes to a person like Sammy and I, the trap line goes with them, the wa'wais goes with them and there it becomes stewards of the land; that's how it works.
…
3916. One of the things that were learned as I was growing up is the stewardship of east wa'wais. In order for me to go to Sammy's wa'wais, if we want to harvest anything, we had to go to the person and ask permission. That's how they could monitor it and be good stewardship and make sure that things are not overfished or people go there and clean it out. So that's our culture.

Chief Legaix, Rod Bolton, Transcript Vol. 8, lines 3905, 3911 and 3916

3958. In our system, as you heard my Chief speak about it, that we were taught and had to be well-knowledged [sic] by our traditional system and be respectful and show good leadership. So with that, my name is Tequicah (ph), a Chief for the Eagle Tribe in the Kitlope, Kemano area. And this name that I carry is the steward of the Saint Mathews Bay which is a big bass area up in Gardner Canal towards Kitlope.

Chief C'ekwikas, Ken Hall, Transcript Vol. 8, line 3958

4317. So when my people complain to me that they're not working and asking why I don't approve the next project coming down the pike, it's because I've got to answer the environmental question fully and foremost first; that's what I got to do. I got to protect what we have in Haisla territory; I owe it to the generations 50, 100, 150 years down the line; I got to do my job.
4318. It's mandated to me by my community and I think, more importantly, it's mandated by Nuyem and it's mandated by Nusa, the teachings. It's built into us. Something as simple as spitting in a graveyard is not allowed, you're not allowed to pick berries in a graveyard; that's how deep our laws go. And if there's a potential for environment degradation, don't do it. That's something that non-Haisla culture hasn't absorbed yet.

Chief Councillor Ellis Ross, Transcript Vol. 8, lines 4318 to 4321

> Our *nuyem* requires us to make sure that enough oolichan pass up the river to spawn before we take any. If there are not enough oolichan returning, we cannot harvest them.
>
> *Exhibit D80-23-2, p. 31, Affidavit of Christopher Walter Wilson*
>
> It is important to me to keep our environment and land in pristine shape. I believe we need to take care of our land, so our future Haislas can harvest the same foods that we have harvested since the beginning of our time.
>
> *Exhibit D80-23-2, p. 64, Affidavit of Freddy Ringham*

168. The Haisla Nation's assertion and continued exercise of its stewardship obligations is borne out in the evidence provided in the Affidavit of Chief Councillor Ellis Ross and the correspondence attached as Exhibits to that Affidavit. This evidence demonstrates that the Haisla Nation has been working tirelessly toward the preservation and protection of the Territory's environmental integrity through rehabilitation of the Kitimat River from sewage and effluent, the protection of important fish habitat and safeguarding the Territory's forests. The Haisla Nation has an unwavering commitment to ensure that all activities within the Territory are environmentally sound and sustainable.

Exhibit D80-24-2, paras. 6, 7, 14, 20, 21, 24, 42 and 60, Affidavit of Chief Councillor Ellis Ross
Exhibit D80-24-3, pp. 27 and 58
Exhibit D80-24-4, pp. 1 and 81

7.4 Conclusion on Haisla Nation Strength of Claim

169. The Haisla Nation has provided clear, cogent, strong and uncontested evidence to demonstrate its exclusive use and occupation of Haisla Nation Territory in 1846. The Haisla Nation has also provided evidence that clearly demonstrates the resources that the Haisla Nation has relied on and continues to rely on in the exercise of its aboriginal rights.

170. **Finding Requested: The Panel should find that the Haisla Nation has a very high strength of claim to its Territory, and that it has provided clear, cogent and persuasive evidence of exclusive use and occupation of its Territory that pre-dates 1846.**

171. **Finding Requested: The Panel should find that Haisla Nation members rely on the lands, water, and resources of Haisla Nation Territory in the exercise of their aboriginal rights, and that the exercise of these rights entails fishing, hunting, trapping and gathering in Haisla Nation Territory and, more specifically, in the *wa'wais* which will be impacted by the proposed project.**

8. Haisla Nation Cultural Heritage

172. The Haisla Nation has provided evidence in these proceedings of its history, its culture and its cultural heritage. Haisla Nation culture and cultural heritage depend on the ability of Haisla Nation members to exercise their aboriginal rights, including Haisla Nation aboriginal title and the privileges and obligations inherent to that title.

173. Haisla Nation cultural heritage is integrally linked to the Haisla Nation's relationship to the lands, water, and resources of its Territory and its governance of these resources. The way in which these resources are managed and used defines, supports, and fosters Haisla Nation cultural heritage.

> Socially: The harvesting and sharing to food resources of Haisla Territory is truly a social event. It brings us together as we find ourselves out on the lands and on the waters in the acts of harvesting the foods and other resources. At these times we learn from one another and teach the young the lessons that we have learned about the harvest, about self determination and about leadership. We cement old friendships and develop new friendships. These meetings effectively become social events of social and cultural development, where we hear each other's renditions of old stories and past personal experiences, on the waters and on the land. This is effectively a recording of our living history, as well as the reestablishment and reinforcement of cultural norms, and ultimately, for us as Haisla, it is a community building process. It is through such social activity that the Haisla Culture continues to find its basis. The loss of harvesting practices due to the loss or destruction of natural resources would mean the loss of this social activity that is crucial to the continuation of Haisla Cultural Identity and the longevity of Traditional Haisla Cultural Practices and Society. This would truly be a tremendous loss of quality of life at many levels, for myself, for my family and friends, and for the local and the extended Haisla Community.
>
> *Exhibit D80-34-2, p. 7, Affidavit of Thomas Gregory Robinson*

174. Haisla Nation stewardship of its lands, water, and resources is founded in Haisla *nuyem*, the Haisla laws that govern land holdings and transmission and resource use. Haisla *nuyem* is described in detail by Dr. Powell in *Stewards*.

> *Exhibit D80-22-4*

175. Key elements of Haisla *nuyem* that are integral to Haisla Nation identity are the concepts of *wa`wais* and *bagwaiyas*. These land holding concepts define the way in which the land is held and managed to foster the continued viability of the lands, water, and resources of Haisla Nation Territory to support the Haisla people.

176. The Haisla Nation's concepts of *nuyem*, *wa'wais*, and *bagwaiyas* are components of Haisla Nation governance and its relationship to its Territory. This relationship requires the Haisla Nation to act as a steward in its Territory and to, in the context of this stewardship, ensure that the lands, water, and resources of the Haisla Nation Territory are protected for future generations of Haisla Nation members.

177. Haisla *nuyem* requires and facilitates the ongoing Haisla Nation stewardship of its lands, water, and resources, in keeping with the Haisla Nation's stewardship obligations to its Territory. Haisla *nuyem* is thus a key element of Haisla Nation cultural heritage.

178. Another key element of Haisla Nation cultural heritage is *nusa*, which can be described as teaching by doing. This is a fundamental aspect of the way in which Haisla Nation culture

and identity is transmitted from one generation to the next. *Nusa* is described in many of the affidavits of Haisla Nation members. Examples include:

> In an oral culture, such as ours, the practice of preparing resources and passing on our knowledge of each item is how we learn. Connecting and learning from our elders is how our culture has always been passed through generations. *Nu sa* is the term we use for our teaching. What little we have learned of our language has been learned during the bonding process between our elders and family members. Through this process our knowledge about our culture, our respect for each other, and for the land is passed on.
>
> *Exhibit D80-23-3, p. 31, Affidavit of Nancy Nyce*
>
> Haisla is an oral culture, I have learned our traditional ways through being *nu sa*'d (taught) by my mother, and other family members, how to prepare resources.
>
> I learned to respect resources, land and society through the *nu sa* process and our *nu yum*.
>
> *Exhibit D80-23-3, p. 46, Affidavit of Roberta Vera Grant*
>
> Harvesting and preparing our daily food sources are important to my culture. Through our food, we teach our culture. I teach my children how to can fish and how to clean shellfish. I will teach my daughters how to smoke fish. When we prepare food together, I teach my children and grandchildren how to speak Haisla. This is an opportunity for me to pass on my culture.
>
> *Exhibit D80-23-3, p. 15, Affidavit of Loretta Adeline Gray*
>
> I was *nu sa'd* (taught) at an early age by my father, grandfather, and uncles to harvest and prepare our resources; this is how I have learned the traditional ways.
>
> '*Nu sa*' is the term that is used when teaching. What little I have learned of our language has been primarily learned during this bonding process with my family members. It is during this process that knowledge and respect for each other and the land was learned.
>
> I am a teacher of our traditional harvesting methods and places and '*nu sa*' for my children, grandchildren, nieces and nephews.
>
> *Exhibit D80-23-3, p.28, Affidavit of Morris Heber Grant*

179. The Haisla Nation asserts aboriginal title to the lands NG is proposing to use for the terminal and pipeline ROW. The Haisla Nation's aboriginal title to these lands includes the right to choose the way these lands are used. Haisla *nuyem* requires the Haisla Nation to govern the use of the lands, water, and resources of Haisla Nation Territory in a way that is consistent with Haisla Nation stewardship obligations. That requires ensuring the

continued viability of the lands, water, and resources of Haisla Nation Territory to support the Haisla people and Haisla Nation cultural heritage.

180. Haisla Nation cultural heritage depends on the lands, water, and resources of Haisla Nation Territory being available to enable Haisla Nation members to fish, hunt, trap and gather the resources they have traditionally relied upon. If Haisla Nation cultural heritage is to be preserved, Haisla Nation members must be able to take these resources from the places they always have, so that they can teach the next generation of Haislas where these places are, when they are used, how they are used, and why they are used. If Haisla Nation cultural heritage is to be preserved, Haisla Nation members must be able to process these freshly taken resources with the next generation of Haislas, so they can teach them how to process them, how to store them, when to use them and why things are done the way they are.

181. Haisla Nation members have attested to the central role that the taking and processing of resources plays in ensuring that Haisla Nation practices and cultural identity are continued:

> If my ability to gather and to prepare our traditional foods were lost or compromised it would remove all that is Haisla from within me. The anchor that holds us as individuals, family members and community members to the land, and to each other, would be broken. I believe Haisla life would be inextricably altered.
>
> *Exhibit D80-23-3, p. 32, Affidavit of Nancy Nyce*
>
> The act of harvesting the natural resources from within Haisla Traditional Territory, is for us, a practice that goes back to the time of our ancestral birth; it goes back to the ancient time of our arrival on this land; it goes to the time before the intervention of Western culture and politics. Our historic and present knowledge of food and resource harvesting techniques and practices, otherwise known as 'Hunting and Gathering', developed, over millennia, as our ancestors increasingly became more attuned to the physical environment and resources of Haisla Traditional Territory. The harvesting of food and resources reconnects us with the time when our cultural identity and perspective of self was clear and unobstructed.
>
> *Exhibit D80-34-2, p. 4, Affidavit of Thomas Gregory Robinson*
>
> If I lost the ability to hunt and trap, I don't think I would be able to survive. I don't think the Haisla Nation would be able to survive. We live off the land and most of what we eat is from the land.
>
> I'm afraid that our culture will die off if my people's ability to hunt and fish were lost. Once our culture is gone we are going to have a hard time. We will lose our anchor to our land and we will be scattered all over the place.
>
> *Exhibit D80-23-3, pp. 48-49, Affidavit of Ronald Reece*

182. NG's proposed project is a threat to Haisla Nation cultural heritage. The project carries with it an inherent risk of a spill. An oil or condensate spill will cause significant adverse environmental effects on the lands, water, and resources that the Haisla Nation relies on for its cultural identity. As set out in Sections IV, V and VI below, concerns that such a spill will occur and it will result in significant adverse effects is well-founded.

183. The risk of an oil or condensate spill that will cause significant adverse environmental effects on the lands, water, and resources that the Haisla Nation relies on for its cultural identity is one of the critical reasons that the Haisla Nation has not chosen and will not choose to use the lands of its Territory for an oil and condensate terminal and pipelines. Such use is inconsistent with Haisla Nation stewardship obligations and puts at risk Haisla Nation cultural heritage.

184. Dr. Powell has captured these concerns in *Stewards*:

> The Haisla are clear that their identity is based on their lands and their past, but that their obligation is to their land and their future. And that future depends on maintaining the vitality of their land. It relies on a continuing, productive natural environment in their traditional territory. This issue is the crux of Haisla introspection and, ultimately, misgivings about the pipeline, terminal and tanker traffic within their traditional territory which could result in catastrophic loss of that distinctive environment-based cultural life that defines them as Haisla.
>
> *Exhibit D80-22-4, p. 21*

185. The Haisla Nation's asserted aboriginal rights, including aboriginal title to the proposed terminal site and the pipeline ROW, the strength of the Haisla Nation's claim, the strong connection of the Haisla Nation to the lands, water, and resources of its Territory, the Haisla Nation's stewardship obligations and the dependence of Haisla Nation cultural heritage on the lands, water, and resources of Haisla Nation Territory need to be considered in the assessment of whether the proposed project is in the Canadian public interests.

9. Proposed Project Fundamentally Infringes of Haisla Nation Aboriginal Title

186. If NG's proposed project proceeds, it will result in a fundamental infringement of Haisla Nation aboriginal title to the pipeline ROW and the terminal site. Aboriginal title is a right to the land itself.

187. The infringement would be an infringement of the deepest possible type: it would infringe the Haisla Nation's right to exclusive use and occupation of the land. The use and occupation of the land would be usurped by NG.

188. Aboriginal title includes the right to choose the use to which the land is put. The proposed project would infringe this aspect of Haisla Nation aboriginal title, by running

roughshod[58] over the Haisla Nation's chosen use for the lands, which does not include the proposed project.

189. Aboriginal title also includes an inescapable economic aspect. The Haisla Nation has its own plans for these lands, and they do not include the proposed project. The Haisla Nation has selected the terminal site lands in its treaty land selection package, and the Haisla Nation has its own aspiration for the use of these lands in a manner that is consistent with Haisla Nation *nuyem*, with Haisla Nation stewardship obligations, and that will not imperil Haisla Nation cultural heritage. NG is proposing to infringe the economic aspect of Haisla Nation aboriginal title by expropriating the economic benefit of the lands.

10. NG Engagement Has Been Inadequate

190. Although Canada has clearly stated that it has not delegated any aspects of the Crown consultation obligation to NG, NG is under the impression that it has been delegated certain procedural aspects of the duty to consult.

Exhibit E9-21-12, pp. 2-3
Ms. Holder, Transcript Vol. 153, lines 27673

191. NG's engagement with the Haisla Nation has been inadequate to discharge any aspects of Crown consultation.

10.1 NG's Information on Project Impacts on Aboriginal Groups is Not Reliable

192. As part of its application, NG has included information on its aboriginal engagement. This information consists of summaries of information and correspondence provided by Aboriginal groups to NG. NG has described these summaries that are meaningful and that try to capture the concerns and interests set out in the correspondence.

Ms. Holder and Mr. Carruthers, Transcript Vol. 153, lines 28007-28010

193. For example, a comparison of NG's aboriginal engagement update filed in February of 2013 to the correspondence it sought to summarize demonstrates the extent to which these summaries fail to fully capture the Haisla Nation's concerns and cannot safely be relied on for identifying these concerns or to demonstrate that these concerns have been addressed.

Exhibit B207-8, pp. 53 and 54
Exhibits D80-92-3, D80-92-4, D80-92-5

194. NG described the Haisla Nation's January 11, 2013 letter as raising concerns regarding NG's intention to complete investigative work in Haisla Nation Territory, declining to participate in the proposed NG boat tour, and raising concern that federal government decision makers had not met with the Haisla Nation Council decision-makers to start meaningful consultation despite repeated requests.

[58] In *Haida Nation, supra*, the Supreme Court of Canada wrote: "The Crown, acting honourably, cannot cavalierly run roughshod over Aboriginal interests where claims affecting these interests are being seriously pursued in the process of treaty negotiation and proof (para. 27).

Exhibit B207-8, pp. 53 and 54

195. NG's description mischaracterizes the content of the Haisla Nation's January 11, 2013 letter by omitting context. The Haisla Nation's January 11, 2013 letter specifically characterized NG's request to complete investigative work in Haisla Nation Territory as premature, since none of the work would inform the JRP process, since the investigative work is invasive and was anticipated to result in direct impacts to Haisla Nation Territory, and since there is uncertainty as to whether the project will be allowed to proceed.

Exhibit D80-92-3, p. 3

196. With respect to the boat tour, the Haisla Nation expressed its understanding that this tour was simply for NG and its contractors to view the site and take photographs, and that the Haisla Nation had been asked to participate as an observer. Since no terrestrial contact was anticipated, the Haisla Nation was not concerned that NG and its contractors would negatively impact Haisla Nation Territory, and thus declined to commit valuable human resources to the tour.

Exhibit D80-92-3, p. 2

197. By omitting the reasons for the concerns the Haisla Nation raised, NG seeks to paint the Haisla Nation as obstructionist and unwilling to engage. This is not the case. The Haisla Nation responded reasonably to what it viewed as a premature request for permits to conduct ground-altering work in its Territory, and made a sound decision on the allocation of Haisla Nation human resources.

198. NG describes the Haisla Nation's February 1, 2013 letter as "addressing additional concerns with the Temporary Permit Application process, as well as specific concerns relating to each application area", and states that the Haisla Nation asked NG to withdraw the Temporary Permit Applications. This description also mischaracterizes the true tenor and content of the Haisla Nation's letter.

Exhibit B207-8, pp. 53-54

199. The Haisla Nation did raise additional concerns with the Temporary Permit Application process. These concerns were directly related to NG's disrespectful conduct of offering to meet to discuss concerns on the eve of filing an additional twelve applications for permits. The Haisla Nation also set out in detail the concerns with each of the applications, and identified errors and omissions which rendered the applications incomprehensible. Finally, the Haisla Nation also identified fundamental information that was missing from the applications which suggested the proposed work would have less impact on Haisla Nation Territory than it actually will. The Haisla Nation asked NG to withdraw and revise the applications to address the shortcomings identified by the Haisla Nation.

Exhibit D80-92-4 (generally)

200. NG's description of the Haisla Nation's February 1, 2013 letter fails to provide the context for the content NG has set out. As with the January 11, 2013 letter, NG's limited descriptions mischaracterizes the true tenor and content of the Haisla Nation's correspondence. The Haisla Nation notes that this set of correspondence is one of the few

examples in the record that allows a comparison of what NG has set out in its aboriginal engagement updates to the submissions made by an Aboriginal group. The way NG has characterized the Haisla Nation correspondence raises concerns about the accuracy and reliability of NG's aboriginal engagement material generally.

201. Further, the *Scope of Factors* for the review of the proposed project direct NG to provide a detailed description of consultations with Aboriginal groups, concerns raised, how those concerns have been addressed, and outstanding issues. NG's summaries do not provide the requisite level of detail required by the *Scope of Factors*.

    Exhibit D122-3-13, p. 13

202. The Haisla Nation has reviewed and provided preliminary comments on the aboriginal engagement material submitted by NG that capture a number of concerns that the Haisla Nation has with NGs application and subsequent filings. This argument will set out additional Haisla Nation concerns.

    Exhibit D80-92-5

203. NG has also demonstrated a failure to meet its commitment to communicate Aboriginal group concerns regarding the appropriateness of Crown consultation to Crown agencies that may have a review or decision making role, through an abject failure to make any mention of the Haisla Nation's concerns with the consultation process in its application for Temporary Use Permits from the government of British Columbia. In oral questioning NG re-characterized this as a commitment to make such concerns known only to federal Crown agencies and stated that the concerns of the Haisla Nation would be well known to the Province. With respect, this is a weak and disingenuous explanation.

    Exhibit B24-2, p. 366
    Ms. Holder, Transcript Vol. 153, lines 27693-27712

10.2 NG is Not Taking Haisla Nation Concerns Seriously

204. NG has not demonstrated that it is taking the Haisla Nations concerns seriously. This is most apparent in the work it has done in the Kitimat River Valley.

205. In September of 2010, the Haisla Nation made submissions on the adequacy of the information provided in NG's application. This included requests that the additional work be conducted as part of the review process, to inform any decision of the Panel, consisting of *inter alia*:

- Justification how Kitimat was selected for the pipeline termination point and for the marine terminal;
- Detailed information of the nature of the cargo to be transported in the proposed project;
- A clear understanding of the baseline conditions in areas potentially impacted by the proposed project, including but not limited to marine flora and fauna, seasonal utilization of habitats, and eulachon movement patterns;

- An assessment of cumulative environmental effects which will result from the proposed project;
- Detailed information about how NG will respond to a spill;
- Detailed information about local meteorological and terrain stability issues; and
- Detailed information about effects of the environment on the project.

Exhibit C144-1

206. When NG's aboriginal engagement panel was questioned about the Haisla Nation's concerns relating to a spill of oil into the Kitimat River, NG identified work it had undertaken to specifically address the concerns of the Haisla Nation. As is shown at paras. 1000 to 1031 below, this work does not come close to addressing the Haisla Nation's concerns.

207. Further, in the context of discussing the Kitimat River Valley, NG returned to work done to examine the effects of a spill into the Kitimat River at Hunter Creek at the request of the Haisla Nation. The additional work done by NG does not provide the information sought by the Haisla Nation.

208. NG referred to Haisla Nation IR Nos. 1.40, 1.44, 2.27, 2.35, 2.37, 2.38, 2.39, 2.45 and 2.46 as requests from the Haisla Nation that a hypothetical spill at Hunter Creek be modelled.

D80-17-1, Dr. Horn, Transcript Vol. 147, line 19736

209. The EHHRA may be notionally responsive to Haisla Nation IR No. 2.39, but does not provide the level of detail requested. It is in no way responsive to the other Information Requests.

Exhibit D80-13-1, pp. 65-72
Exhibit D80-17-1, pp. 34-56

210. Haisla Nation IR No. 1.40(e) requested information about the extent of sediment contamination resulting from a spill of 2000m^3 at Hunter Creek and depth to which it would be contaminated and the depth and extent to which it would be remediated.

Exhibit D80-13-1, p. 65

211. Haisla Nation IR No. 1.44(e) asked NG to reanalyze the spill scenario it modelled for Hunter Creek to estimate the volume which would be spilled if a value was destroyed. IR No. 1.44(f) sought specific weathering information.

Exhibit D80-13-1, p. 72

212. Haisla Nation IR No. 2.27 makes no mention of Hunter Creek. Haisla Nation IR No. 2.35 asked NG to conduct a hypothetical spill model based on valve closure failures. Haisla Nation IR No. 2.37 and 2.38 sought information about control points. Haisla Nation I.R. No. 2.45 and 2.46 sought for more detail than set out in the EHHRA and sought information about a suite of other matters.

Exhibit D80-17-1, pp. 34-56

213. As is demonstrated in Section IV below, NG's application and additional submissions are still lacking critical information and analysis for the Kitimat River Valley. So while NG has done some additional work in the Kitimat River Valley that it has not done elsewhere, this additional work has not been adequate to address Haisla Nation concerns or the uncertainties in NG's application that prevent a reasonable assessment.

10.3 NG Has Not Considered Haisla Nation Aboriginal Title or Haisla Nation Cultural Heritage

214. NG has acknowledged that the Haisla Nation has asserted aboriginal title to its Territory and to lands required for the proposed project, but has not engaged with the Haisla Nation over aboriginal title. NG's ESA has not considered potential impacts of the proposed project on Haisla Nation aboriginal title.

Mr. Doering, Transcript Vol. 88, lines 8185-8186
Mr. Green, Transcript Vol. 114, line 12741

215. NG has stated clearly that it views aboriginal title as something which is between Aboriginal groups and the Crown.

Ms. Holder, Transcript Vol. 153, line 28101

216. Finally, the ESA was not done in a manner that considers impacts from an aboriginal perspective and does not include enough detail to allow the Haisla Nation or any other Aboriginal group to identify site specific concerns along the pipeline ROW. NG has also failed to fully appreciate Haisla Nation cultural heritage and identify how that cultural heritage may be impacted by the proposed project.

217. It is important to remember that the proposed project, if it is built, will never be out of sight of the Haisla Nation community. The viewshed assessment makes it clear that it will be visible from Kitamaat IR No. 2, a constant reminder of the risk it is posing to Haisla Nation Territory and Haisla Nation cultural heritage.

Exhibit B3-18, p. 52

11. The Crown Has Not Discharged its Duty to Consult

218. The Haisla Nation's strong aboriginal title claim to land to be used for the proposed project and to aboriginal rights throughout Haisla Nation Territory coupled with the certainty of impacts to the Haisla Nation's asserted aboriginal rights and title impose on the Crown an obligation to meaningfully consult with the Haisla Nation at the highest end of the consultation spectrum prior to making any decision that allows the proposed project to proceed.

219. Jurisprudence has resulted in the development of clear guidelines about how consultation is to be carried out, procedurally. These guidelines have, in turn, informed government policies and the development of government guidelines. The federal government has its own guidelines for aboriginal consultation, *Aboriginal Consultation and Accommodation, Updated Guidelines for Federal Officials to Fulfill the Duty to Consult, March 2011*, which has been filed as evidence in these proceedings.

Exhibit E9-6-7

11.1 Consultation to Date Not Meaningful

220. The Crown has developed a "whole of government" approach to consultation for this project, and seeks to rely on the JRP review process to discharge as much of its duty to consult as possible.

Mr. Engelsjord (DFO), Transcript Vol. 167, lines 16620-16624 and 16644-16645
Exhibit E9-21-12, p. 3

221. The Crown's consultation approach is profoundly flawed. To date, the Crown has not only failed to adhere to the procedural requirements for consultation laid down by the courts, but has also failed to follow its own guidelines. The court decisions dealing with consultation have laid down the following principles:

- Consultation must occur at the earliest stage in order to be meaningful;[59]
- Consultation must be open, transparent, and timely;[60]
- The consultation with the First Nation must be at least "a distinct process", if not a more extensive one, from consultation with other stakeholders;[61]
- The Crown must provide the First Nation with "full information" and must fully inform itself of the practices and views of the First Nation;[62]
- The First Nation's interests and concerns must be considered and, wherever possible, demonstrably integrated into the proposed plan of action;[63]
- Consultation must address the substance of the First Nation's concerns;[64]
- Infringement must be minimized;[65]
- Operation under a time-constraint does not relieve government of its duty to consult;[66] and
- At the very least, the Crown must adhere to its own policies.[67]

222. The federal government's guidelines refer to and rely on some of the same principles as the foundation for a meaningful consultation process. Consultation must be:

- carried out in a timely, efficient and responsive manner;
- transparent and predictable;

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[59] *Squamish Nation et al* v. *The Minister of Sustainable Resource Management et al,* 2004 BCSC 1320.
[60] *Musqueam Indian Band* v. *B.C. (Min. Sust. Res. Mgmt.),* 2005 BCCA 128.
[61] *Mikisew Cree First Nation* v. *Canada (Min. Heritage*), 2001 FCT 1426 [*Mikisew*].
[62] *Halfway River First Nation* v. *B.C. (Min. Forests),* [1997] 4 C.N.L.R. 45 (BCSC), 199 BCCA 470 [*Halfway River*].
[63] *Halfway River, supra*.
[64] *Taku River, supra*.
[65] *Mikisew, supra*.
[66] *Gitxsan First Nation* v. *B.C. (Min. Forests*), 2002 BCSC 579.
[67] *Cheslatta Carrier Nation* v. *B.C.*, 2000 539 BCCA.

- accessible, reasonable, flexible and fair;
- founded in the principles of good faith, respect and reciprocal responsibility;
- respectful of the uniqueness of First Nation, Métis and Inuit communities; and
- include accommodation (e.g. changing of timelines, project parameters), where appropriate.

Exhibit E9-6-7, p. 18

11.1.1 Haisla Nation Expressed Concerns About the Crown's Consultation Approach

223. In its oral evidence Canada referred repeatedly to the opportunity for engagement afforded to all Aboriginal groups at the outset of process on how consultation would be carried out with respect to the project. This consisted of an opportunity to comment on a draft Joint Review Panel Agreement. Canada takes the position that the Aboriginal Consultation Framework it has developed reflects the concerns identified as a result of comments provided by Aboriginal groups.

Mr. O'Gorman, Transcript Vol. 174, for example, lines 27592 and 27890
Exhibit E9-6-9

224. With respect, Canada's evidence in this regard was misleading and incomplete. While Canada afforded the Haisla Nation with an opportunity to comment on the proposed process for the review of the project, the Haisla Nation's comments were disregarded. Canada has created the appearance of having discussed the project review and consultation process with Aboriginal groups, but in reality there was no discussion. Consultation must entail more than a mere opportunity to blow off steam,[68] but with respect to consultation over the design of project review and the consultation process, this was all that was afforded to the Haisla Nation.

225. The Haisla Nation provided comments to Canada on the draft Joint Review Panel Agreement. The Haisla Nation also advised Canada of its concerns about the proposed project and provided recommendations for what the process should look like. Haisla Nation correspondence about this has been filed as evidence in these proceedings. This correspondence identifies the Haisla Nation's requests to be involved in the design of a consultation process and the concerns about the timing of consultation in the context of the JRP review.

Exhibits D80-1-2 to D80-1-7

226. The Haisla Nation has continued to advise Canada about its concerns with the consultation process which Canada unilaterally imposed on the Haisla Nation. This has included concerns about the potential impacts of the proposed project on Haisla Nation aboriginal rights, including aboriginal title, and requests for early consultation on matters that are beyond the scope of the JRP review process, such as Haisla Nation aboriginal title. The Haisla Nation has repeatedly asked for early meetings with decision makers in order

[68] *Mikisew Cree, supra*, para. 54.

to discuss the development of a meaningful consultation process to address potential infringements of the Haisla Nation's aboriginal title as a result of the proposed project.

Exhibits D80-6-1, D80-2-1 and D80-4-1

227. One of the concerns that the Haisla Nation raised about the consultation process relates to the amount of time Canada will have to engage in meaningful consultation. Canada has confirmed that it intends to complete Phase IV of its consultation in the six months following the JRP's issuance of its report. Canada appears to have pulled this time limit out of thin air. It does not correspond to any reasonable or objective estimate of the amount of time that will be required for a meaningful process. The six month time frame is too short. It is unrealistic to expect that the Crown can meaningfully consult with the Haisla Nation about the impacts of the proposed project in that time frame.

Mr. Hubbard (NRCan), Transcript Vol. 174, lines 27338-27341

228. To date, Canada has refused to meet with the Haisla Nation to discuss the Haisla Nation's aboriginal title claim. The Haisla Nation sought to obtain information it sees as relevant to this claim, such as additional information about the Haisla Nation's Comprehensive Claim and Canada's assessment of the Haisla Nation's strength of claim through the JRP process, but Canada has not provided this information.

229. **At a minimum**, the following consultation steps still will have to occur:

- identifying potential impacts of the proposed project which have not been addressed (in addition to Haisla Nation aboriginal title);
- meeting to discuss a protocol for consultation and to identify the appropriate government representatives and Haisla Nation members to engage in that process;
- discussion of the Haisla Nation's strength of claim and the scope of consultation required;
- possible further refinement of the consultation process;
- exchange of information about potential impacts on Haisla Nation aboriginal rights, including to aboriginal title;
- consultation meetings to discuss impacts and potential accommodation, including adjustments to the proposed project, development of additional mitigating measures, consideration of changes to proposed activity, additional terms and conditions to be attached to permit or authorization, financial compensation, and consideration of rejection of the proposed project; and
- discussion of the suitability of potential accommodation and residual impacts that have not been accommodated.

230. A meaningful consultation process must be responsive, and may have to provide accommodation in the form of changing timelines. Canada, however, has constrained its timelines in legislative amendments, made after the JRP review commenced, for consultation. This raises a real apprehension and a high likelihood that consultation will not be afforded the time required to allow it to proceed in a meaningful manner.

Exhibit E9-6-7, p. 18

11.1.2 Haisla Nation Concerns are Borne Out

231. The concerns raised by the Haisla Nation about Canada's proposed approach to consultation are coming to fruition.

232. Canada has adhered to the strict process of consultation it has unilaterally imposed for the proposed project, including a "whole of government" approach with engagement occurring strictly through the JRP process. Canada describes its use of the JRP process as the primary means of consultation and the opportunity to participate in this process as providing all Aboriginal groups with an opportunity for deep consultation.

Mr. O'Gorman, Transcript Vol. 173, lines 26480-26482
Mr. O'Gorman, Transcript Vol. 174, lines 26851, 26859, 26865, 26866 and 27535

233. Calling something "deep consultation" does not make it deep consultation. Canada's guidelines set out the content of deep consultation to consist of: exchange of information, correspondence, meetings, site visit, researching, studies, opportunity to make submissions to decision-maker, providing written reasons, and determining accommodation, where appropriate: seek to adjust project, develop mitigating measures, consider changing proposed activity, attach terms and conditions to permit or authorization, financial compensation, consider rejecting a project, etc.

Exhibit E9-6-7, p. 48

234. As a result of the process Canada has imposed, Canada has precluded any opportunity for meaningful two-way dialogue up to this point. Canada is essentially engaging in the JRP process for the "gathering of information". Thus, consultation has not truly started. At best the JRP process is providing some information to Canada that could be helpful when it is finally willing to engage in a two-way consultation process. The deep consultation components of exchange of information (about anything other than the process Canada has established), correspondence (again, about anything other than the process Canada has established), and meetings have not occurred to date. None of the federal departments have met with the Haisla Nation since the JRP review has commenced for any purpose other than to tell the Haisla Nation it is only engaging in consultation through the JRP review for now. This is not consultation. It is, perhaps, an initial step towards a consultation process.

Mr. O'Gorman, Transcript Vol. 173, line 26488
Mr. Engelsjord (DFO), Transcript Vol. 167, lines 16612-16645
Mr. Engelsjord (DFO), Transcript Vol. 168, lines 17939 and 17952
Ms. Maclean (EC), Transcript Vol. 168, lines 18195-18196
Exhibit D80-29-2 to D80-29-5, Affidavit of Laurie Bonacci

235. Canada has outlined in a very general way what it anticipates will occur in Phase IV of consultation. Phase IV is to entail Aboriginal groups informing Canada whether their concerns are accurately characterized in the Panel's report, what their views are on whether the mitigation measures that are recommended would address those concerns, and what concerns remain outstanding. Again, all of this is Canada's unilateral view of

how consultation will occur. It was developed without meaningful discussion with the Haisla Nation, thereby violating both the case law[69] and Canada's own guidelines.

Mr. O'Gorman, Transcript Vol. 174, line 27278
Exhibit E9-6-7, p. 18

236. It is after Canada has received comments from Aboriginal groups about the Panel's report that Canada says it intends to carry out the remaining consultation required to ensure the process is meaningful. Canada has stated that it has allowed only 6 months from submission of the Panel's report to the government decision on the regulatory process, thus giving itself 6 months to complete Phase IV.

Transcript Vol. 174, lines 27340-27346

237. The Haisla Nation has no confidence that Canada can accomplish the consultation that is required to take place with the Haisla Nation over the proposed project in a meaningful way in a 6 month period. The imposition of a 6 month time limit is completely divorced from any realistic understanding of what deep consultation about the proposed project will actually have to entail if it is to be meaningful.

238. Further, Canada is ignoring information it has received and is receiving both within and outside the JRP process that is relevant to issues that fall beyond the mandate of the JRP. The Haisla Nation has written numerous letters to federal government representatives seeking meetings to discuss potential impacts to Haisla Nation aboriginal title.

Exhibits D80-6-1, D80-2-1 and D80-4-1

239. NG's ESA has not considered potential impacts of the proposed project on Haisla Nation aboriginal title, and NG has stated clearly that it views aboriginal title as something which is between Aboriginal groups and the Crown.

Mr. Green, Transcript Vol. 114, line 12741
Ms. Holder, Transcript Vol. 153, line 28101

240. The Haisla Nation has advised the Crown from the outset that the JRP review of the proposed project cannot address Haisla Nation aboriginal title, and sought meetings with federal decision makers to discuss a meaningful consultation process.

241. The Crown has not consulted with the Haisla Nation outside the JRP process. Further, federal departments with future regulatory roles have not done so either.

Mr. Engelsjord (DFO), Transcript Vol. 167, lines 16612-16645
Mr. Engelsjord (DFO), Transcript Vol. 168, lines 17939 and 17952
Ms. Maclean (EC), Transcript Vol. 168, lines 18195-18196

242. Canada's consultation to date has failed to achieve the following hallmarks of a meaningful consultation process:

- Consultation must occur at the earliest stage in order to be meaningful – Consultation

[69] See para. 221 to 222, above.

it is not occurring at the earliest time possible.

- Consultation must be open, transparent, and timely – There has been no open, transparent and timely two-way discussion; in fact Canada has refused repeated requests from the Haisla Nation for meetings with Canada's decision makers.
- The consultation with the First Nation must be at least "a distinct process", if not a more extensive one, from consultation with other stakeholders – Canada has unilaterally imposed a one size fits all consultation process and has constrained the consultation, to date, to the JRP process, which is not a distinct process for the Haisla Nation or even for Aboriginal groups.
- The Crown must provide the First Nation with "full information" and must fully inform itself of the practices and views of the First Nation – Canada has failed to provide full information to the Haisla Nation or to the JRP process regarding the proposed project.
- Operation under a time-constraint does not relieve government of its duty to consult – Canada has unilaterally imposed time constraints on the JRP review process and on anticipated future consultation, thereby imposing unreasonable and arbitrary timelines.
- At the very least, the Crown must adhere to its own policies – Canada has not adhered to its own guidelines which provide chronological steps for engaging in consultation. The assessment of strength of claim is to occur before the consultation process is developed.

11.2 Canada Has Failed to Provide Relevant Information to the JRP Review

243. Canada is seeking to rely on the JRP review process as part of its meaningful consultation process. Canada has not engaged in the JRP consultation phase in accordance with the honour of the Crown. Canada failed to respond to information requests about the Haisla Nation's comprehensive claim or to provide witnesses who could provide any specific information about the Haisla Nation's comprehensive claim.

Ms. Gauld (AANDC), Transcript Vol. 173, lines 25818-25830

244. Further, Canada failed to file information about the Haisla Nation's comprehensive claim with the JRP, having unilaterally determined that this information would not be relevant to the JRP process.

Ms. Gauld (AANDC), Transcript Vol. 173, lines 25832-25837

245. Questioning of Canada's witnesses indicates that Canada did not file any information relating to any Aboriginal group's strength of claim in the JRP process, as it saw that as something Aboriginal groups should be required to do. Again, Canada has unilaterally decided that information it has relating to the Haisla Nation's strength of claim is not relevant to the JRP process.

Mr. O'Gorman, Transcript Vol. 173, lines 26469-26479

246. Canada has sought to characterize the JRP process itself as a two way engagement process. Canada, however, has failed to provide information the Haisla Nation deemed relevant to this process.

247. Further, by failing to provide this evidence, Canada is depriving the Panel of information that is relevant to the Haisla Nation's strength of claim, and preventing the Panel from seeing, understanding and assessing this information. The Joint Review Panel Agreement for the proposed project contemplates that the Panel be fully informed about the potential impacts of the project on Aboriginal rights and interests:

> 6.5 In order that the Panel may be fully informed about the potential impacts of the project on Aboriginal rights and interests, the Panel will require the proponent to provide evidence regarding the concerns of Aboriginal groups, and will also carefully consider all evidence provided in this regard by Aboriginal peoples, other participants, federal authorities and provincial departments.

248. Canada has asked Aboriginal groups to provide to the Panel information they deem relevant to their aboriginal and treaty rights and how the proposed project may impact those rights. Canada, however, has taken no steps to provide anything beyond the most rudimentary information about Aboriginal groups to the Panel. For the Haisla Nation this consists of general information about treaty negotiations and a statement of intent map.

> *Exhibit E9-6-24, pp. 12-20 and Exhibit E9-6-26, p. 2*

249. When asked, the federal government was not prepared to inform the Panel how the aboriginal title claim of the Haisla Nation informed the information that has been provided to the Panel by the federal government.

> *Mr. O'Gorman, Transcript Vol. 173, lines 26597-26599*

250. Further, oral questioning of federal government participants has demonstrated a number of instances where the federal government participants were either unable or unwilling to provide evidence relevant to the assessment of the proposed project.

- Natural Resources Canada has expertise on acid rock drainage and metal leaching but did not include any evidence on acid rock drainage or metal leaching in its final evidence.

  > *Mr. Clark (NRCan), Transcript Vol. 108, lines 4187-4190*

- Fisheries and Oceans Canada does not have a mandate to conduct an assessment of potential toxicological effects of an oil spill, and Environment Canada has not reviewed or provided any information to the Panel specific to the proposed project on the pipeline component of spills.

  > *Mr. Engelsjord (DFO), Transcript Vol. 108, line 3994*
  > *Dr. Caza (EC), Transcript Vol. 108, line 3968*

- Federal government witnesses were unable to answer questions about the toxicity of dispersants.

Dr. Caza (EC), Dr. Hollebone (EC), Transcript Vol. 167, lines 17557-17574

- With respect to climate change, the federal government only filed some limited evidence, which was limited to frequency and magnitude of storm conditions.

Ms. Anderson (Legal Counsel), Transcript Vol. 168, lines 17893-17896

- When asked whether it had conducted investigations or considered information relating to the subsurface currents in the CCAA or OWA that might affect the movement of submerged oils, Environment Canada stated that it does not measure hydrodynamic data and that this information generally comes from Fisheries and Oceans Canada. Fisheries and Oceans Canada did not provide experts who could speak to subsurface currents.

Dr. Hollebone (EC), Mr. King (DFO), Transcript Vol. 170, lines 21585-21590

- The federal government consultation witness panel was not prepared to prepared to respond to Haisla Nation evidence regarding its aboriginal title:

26596. And how has the Aboriginal title claim of the Haisla Nation informed the information that has been provided to the Joint Review Panel by the Federal Government?
26597. MR. DEAN STINSON O'GORMAN: I'm sorry, Madam Chair, that's a level of detail too specific for me to be able to respond as a part of the evidence -- not really related to the evidence that we have submitted.
26598. As I've said, we haven't been here to speak to the particular issues or concerns that have been put on the record but to the process.

Mr. O'Gorman, Transcript Vol. 173, lines 26596-26598

251. The consultation that the federal government has engaged in to date has not been meaningful. To the extent that Canada is seeking to rely on the JRP process as consultation, Canada's participation has failed to ensure that the Panel is provided with information that is relevant to the Haisla Nation's strength of claim and to potential impacts from the proposed project on Haisla Nation aboriginal rights. The future consultation process proposed by the federal government suffers from significant shortcomings that raise serious doubt that it can be meaningful and that it can be relied on to discharge the honour of the Crown.

12. Conclusion and Findings Requested

252. The Haisla Nation has a very strong *prima facie* claim for aboriginal title to lands required for and put at risk by the proposed project and to aboriginal rights throughout the area that will be affected and put at risk by the proposed project.

253. The proposed project would infringe the Haisla Nation's aboriginal title to the pipeline ROW and terminal site by usurping the Haisla Nation's right to use and occupy those lands, by imposing a use which is inconsistent with the Haisla Nation's chosen use, and by expropriating the economic aspect of Haisla Nation aboriginal title. Further, the proposed project would clear an extensive area of Haisla Nation Territory, resulting in the loss of vegetation, wildlife habitat and fish habitat. Finally, the proposed project will expose not

only the PDA but vast portions of Haisla Nation Territory, including the Kitimat River, Kitimat River Estuary and Kitimat Arm, to the risk of a spill of oil or condensate, without being able to mitigate the effects of such a spill.

254. The Haisla Nation's strength of claim, along with the certain impacts of the project in and on Haisla Nation Territory and Haisla Nation aboriginal rights, places the scope of the Crown's obligation to consult at the highest end of the spectrum. The Haisla Nation is seeking to protect the subject of its aboriginal rights and title – the lands, water, and resources of Haisla Nation Territory – from further infringement as it continues to move forward in seeking reconciliation of its rights with the assertion of Crown sovereignty. Removing the possibility of such reconciliation by approving the proposed project without deep meaningful consultation would not only be illegal but would have the effect of forcing the Haisla Nation to resort to litigation to protect its rights.

255. Canada has designed a consultation approach that has impeded any meaningful two-way discussion of potential project impacts on Haisla Nation aboriginal rights and aboriginal title. Canada has unilaterally designed the process so as to negate the possibility of Crown consultation with the Haisla Nation to occur at the earliest time possible, to prevent open, transparent and timely discussion and to frustrate Canada's obligation to provide full information.

256. The result of this is that the Crown has dug itself into a significant consultation hole. It is not in the Canadian public interest for this project to proceed, given the low likelihood that Canada can dig itself out of this hole in the 6 short months it has allocated to raise consultation from a one-way information gathering process to one that is meaningful and discharges the honour of the Crown.

12.1 The Panel's Mandate with Respect to Aboriginal Rights

257. The federal government has unilaterally established a consultation process for the proposed project which seeks to rely on the JRP review, to the extent possible, as a component of that consultation. The Panel has been charged with issuing a report that takes into consideration a number of matters. The Panel is, on the basis of the legislation and statutory instruments under which it has been constituted, obligated to assess the Haisla Nation's strength of claim, consider potential impacts of the proposed project, and recommend mitigation measures. The Panel is also required to assess adequacy of consultation.

12.1.1 Panel's Enabling Statutes Require Consideration of Aboriginal Rights

258. The Panel is not an emanation of the Crown, or its agent, and as such, does not have an independent duty to consult and accommodate the Haisla Nation. Ryer J.A., for the Federal Court of Appeal in *Standing Buffalo Dakota First Nation v. Enbridge Pipelines Inc.*,[70] a case which examined whether or not the National Energy Board had a duty to consult when making a similar s.52 "public interest" determination, noted:

> I would add that the NEB itself is not under a Haida duty and, indeed, the appellants made no argument that it was. The NEB is a quasi-judicial body

[70] *Standing Buffalo Dakota First Nation v. Enbridge Pipelines Inc.*, 2009 FCA 308 (*Standing Buffalo*).

> (see *Quebec (Attorney General)* v. *Canada (National Energy Board*), [1994] 1 S.C.R. 159, at page 184, and, in my view, when it functions as such, the NEB is not the Crown or its agent.[71]

259. Although the Panel does not have an independent duty to consult and accommodate, it does, like any other quasi-judicial tribunal, have an obligation to consider matters accorded to it in its enabling legislation. For the Panel, this includes considering strength of claim, potential impacts, assessing adequacy of consultation and recommending mitigation measures.

260. Chief Justice McLachlin, in the Supreme Court of Canada decision of *Rio Tinto Alcan v. Carrier Sekani Tribal Council*,[72] a case dealing with the scope of the BC Utilities Commission's obligation to consider consultation and accommodation when making a "public interest" determination, explained that the scope of a tribunal's obligation regarding consultation and accommodation is defined by the tribunal's enabling statute.

> The duty on a tribunal to consider consultation and the scope of that inquiry depends on the mandate conferred by the legislation that creates the tribunal. Tribunals are confined to the powers conferred on them by their constituent legislation: *R.* v. *Conway*, 2010 SCC 22, [2010] 1 S.C.R 765. It follows that the role of particular tribunals in relation to consultation depends on the duties and powers the legislature has conferred on it.[73]

261. The Panel has been established pursuant to the *National Energy Board Act* (NEBA), the *Canadian Environmental Assessment Act* (CEAA), and *the Amended Agreement Between the National Energy Board and the Minister of the Environment Concerning the Joint Review of the Northern Gateway Pipeline Project* (the *JRP Agreement*). The *JRP Agreement* defines the Panel's role in the consultation and accommodation process.

262. Canada has stated that it is relying on the JRP process as part of its consultation. This is confirmed by the Agreement's preamble, which establishes that the Panel process is a part of the Crown's duty to consult:

> 1.0 Preamble
>
> AND WHEREAS: the Government of Canada will rely upon the consultation efforts of the proponent, and the Joint Review Panel process, to the extent possible, to assist in the meeting the duty to consult;
>
> *Amended Joint Review Panel Agreement (A2X0I0), p. 1*

263. Under *CEAA 2012*, the Panel is required to consider a number of effects on Aboriginal people, including the current use of land and resources for traditional purposes. The *JRP Agreement* provides additional specific direction to the Panel on the consideration of impacts of the proposed project on Aboriginal people:

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[71] *Standing Buffalo*, *supra*, para. 34.
[72] *Rio Tinto Alcan v. Carrier Sekani Tribal Council*, [2010] 2 S.C.R. 650, 2010 SCC 43.
[73] *Rio Tinto, supra*, para. 55.

> 6.5 In order that the Panel may be fully informed about the potential impacts of the project on Aboriginal rights and interests, the Panel will require the proponent to provide evidence regarding the concerns of Aboriginal groups, and will also carefully consider all evidence provided in this regard by Aboriginal peoples, other participants, federal authorities and provincial departments.
>
> 8.1 In addition to Subsection 6.5, the Panel will receive information from Aboriginal peoples related to the nature and scope of potential or established Aboriginal and treaty rights that may be affected by the project and the impacts or infringements that the project may have on potential or established Aboriginal and treaty rights. The Panel may include in its report recommendations for appropriate measures to avoid or mitigate potential adverse impacts or infringements on Aboriginal and treaty rights and interests.
>
> *Amended Joint Review Panel Agreement (A2X0I0), pp. 6 and 7*

264. Together, these two sections require the Panel to consider the Haisla Nation's strength of claim and possible impacts and infringements, and gives the Panel the jurisdiction to make recommendations concerning accommodative mitigation measures.

265. Further, the report required from the Panel pursuant to the *JRP Agreement* must contain a *prima facie* assessment of the Haisla Nation's strength of claim and the address the potential infringements by the proposed project. The Panel is required to reach a conclusion in its report on the implications of the Haisla Nation's strength of claim, the potential adverse impacts of the proposed project on the Haisla Nation's asserted aboriginal rights and title, as well as make recommendations for accommodative avoidance or mitigation measures:

> 8.2 The Panel shall reference in its report:
>
> a) the information provided by Aboriginal peoples regarding the manner in which the Project may affect potential or established Aboriginal and treaty rights; and
>
> b) in the case of potential Aboriginal rights, the information provided by the Aboriginal groups regarding the Aboriginal groups' strength of claim respecting Aboriginal rights.
>
> 9.1 The Panel will prepare a report under section 52 of the NEB Act setting out its recommendation on whether a certificate of public convenience and necessity should be issued … The report will also set out the Panel's rationale, conclusions and recommendations relating to the environmental assessment of the project, including any mitigation measures and follow-up programs and a summary of any comments received from the public and Aboriginal peoples, as well as information referred to in Section 8.
>
> *Amended Joint Review Panel Agreement (A2X0I0), pp. 7 and 8*

266. The *JRP Agreement* clearly establishes the Panel's mandate to assess the Haisla Nation's strength of claim, examine potential impacts of the proposed project, and recommend accommodative mitigation measures accordingly. Further, the *JRP Agreement* establishes that the Panel has an obligation to include these considerations in its report.

267. The Federal Court of Appeal, in *Standing Buffalo*, explained that s.35 of the Constitution overlays a tribunal's statutory obligations:

> [T]he decision in *Quebec (Attorney General) v. Canada (National Energy Board)* establishes that in exercising its decision making function, the NEB must act within the dictates of the Constitution, including subsection 35(1) thereof. In the circumstances of these appeals, the NEB dealt with three applications for Section 52 Certificates. Each of those applications is a discrete process in which a specific applicant seeks approval in respect of an identifiable project. The process focuses on the applicant, on whom the NEB imposes broad consultation obligations. The applicant must consult with Aboriginal groups, determine their concerns and attempt to address them, failing which the NEB can impose accommodative requirements. In my view, this process ensures that the applicant for the Project approval has due regard to existing Aboriginal rights that are recognized and affirmed in subsection 35(1) of the Constitution. And, in ensuring that the applicant respects such Aboriginal rights, in my view, the NEB demonstrates that it is exercising its decision making function in accordance with the dictates of subsection 35(1) of the Constitution.[74]

268. A tribunal must fulfill its statutory mandate in accordance with s.35 of the Constitution. Ryer J.A. found that the JRP in *Standing Buffalo* did not have an obligation to make findings on Crown consultation because the Aboriginal group was "unable to point to any provision of the *NEB Act* or any other legislation that prevents it from issuing a Section 52 Certificate without first undertaking a *Haida* analysis or that empowers it to order the Crown to undertake Haida consultations." The legislation and Agreement constituting the Panel, however, does include provisions which empower the Panel to undertake an assessment of consultation.

269. Both the NEB in *Standing Buffalo* and the Panel here are obliged to "[exercise their] decision making function in accordance with the dictates of subsection 35(1) of the Constitution." This obligation is defined by the respective Panel's enabling legislation. Here, as illustrated in the Terms of Reference, above, the Panel has a s.35(1) constitutional obligation to exercise its decision making function to make a Haisla Nation strength of claim finding, examine potential infringements, and suggestion mitigation measures.

12.1.2 The Panel Must Assess Adequacy of Consultation

270. Jurisprudence that examines whether an administrative tribunal has an obligation to assess adequacy of Crown consultation appears to conclude that for projects being reviewed under the *NEBA*, such an assessment is neither required nor permitted (*Standing Buffalo*), whereas for other assessments, such as under previous emanations of

[74] *Standing Buffalo, supra*, para. 40.

BC Utilities Commission Act, such an assessment is proper (*Kwikwetlem First Nation* v. *British Columbia (Utilities Commission)*,[75] *Rio Tinto*, *supra*).

271. Recent jurisprudence examining the obligations of Joint Review Panels constituted under *CEAA 2012* and other legislation provides additional guidance to the Panel. While at first blush the Alberta Court of Appeal decision in *Métis Nation of Alberta Region 1* v. *Joint Review Panel*[76] and the Federal Court decision in *Conseil des innus de Ekuanitshit* c. *Canada (Procureur général)*[77] appear to indicate the Panel has no ability to assess the adequacy of consultation that has occurred to date, the statutory mandate of those JRPs differ in specific ways from that of the Panel. The distinguishing elements of both the mandate of the respective Joint Review Panels and the nature of the applications before the Joint Review Panels support a conclusion that the Panel is required to assess adequacy of consultation that has occurred to date.

272. In *Innus de Ekuanitshit*, the JRP which assessed the Lower Churchill Hydroelectric Generation Project[78] was specifically enjoined from making any determinations or interpretations of*, inter alia*:

- the validity or strength any Aboriginal group's claim to Aboriginal rights or treaty rights;
- the scope or nature of the Crown's duty to consult Aboriginal persons or groups;
- whether Canada or Neufoundland and Labrador has met its respective duties to consult and accommodate in respect of potential rights recognized and affirmed by section 35 of the Constitution Act, 1982.[79]

273. The decision in *Innus de Ekuanitshit* therefore has no bearing on the mandate of the Panel.

274. The JRP charged with assessing the Jackpine Mine Expansion Project[80] has a mandate that is closer to that of the Panel. The JRP reviewing the Jackpine Mine Expansion Project was reviewing it pursuant to *CEAA* and the Alberta *Energy Resources Conservation Act*.[81] That JRP was specifically advised in its establishing agreement that it was not required by the agreement to make any determinations as to:

- the validity of Aboriginal or treaty rights asserted by a participant or the strength of such claims;
- the scope of the Crown's duty to consult an Aboriginal group; or
- **whether the Crown has met its respective duties to consult** or accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act*, 1982.[82]

[75] *Kwikwetlem First Nation* v. *British Columbia (Utilities Commission),* 2009 BCCA 68 (Kwikwetlem).
[76] *Métis Nation of Alberta Region 1* v. *Joint Review Panel*, 2012 ABCA 352 (*Jackpine Mine*).
[77] *Conseil des innus de Ekuanitshit* c. *Canada (Procureur général),* 2013 FC 418, *(Innus de Ekuanitshit*).
[78] *Innus de Ekuanitshit, supra.*
[79] *Innus de Ekuanitshit, supra*, para. 17.
[80] *Jackpine Mine, supra*.
[81] *Energy Resources Conservation Act*, RSA 2000, c E-10.
[82] *Jackpine Mine, supra*, para. 6.

275. The Panel is not subject to the same restrictions. As set out above, the agreement governing the Panel instructs the Panel to provide advice regarding the concerns of Aboriginal groups and the impacts or infringements that the proposed project may have on potential or established rights, and may include in its report recommendations on how to avoid or mitigate these impacts or infringements. The JRP *Agreement* does not, however, unlike the one in *Jackpine Mine*, include any additional language clarifying or specifically restricting the Panel's mandate:

> 6.5 In order that the Panel may be fully informed about the potential impacts of the project on Aboriginal rights and interests, the Panel will require the proponent to provide evidence regarding the concerns of Aboriginal groups, and will also carefully consider all evidence provided in this regard by Aboriginal peoples, other participants, federal authorities and provincial departments.
> …
>
> 8.0 ABORIGINAL CONSULTATION
>
> 8.1 In addition to Subsection 6.5, the Panel will receive information from Aboriginal peoples related to the nature and scope of potential or established Aboriginal and treaty rights that may be affected by the project and the impacts or infringements that the project may have on potential or established Aboriginal and treaty rights. The Panel may include in its report recommendations for appropriate measures to avoid or mitigate potential adverse impacts or infringements on Aboriginal and treaty rights and interests.
>
> 8.2 The Panel shall reference in its report:
>
> a) the information provided by Aboriginal peoples regarding the manner in which the Project may affect potential or established Aboriginal and treaty rights; and
>
> b) in the case of potential Aboriginal rights, the information provided by the Aboriginal groups regarding the Aboriginal groups' strength of claim respecting Aboriginal rights.
>
> *Amended Joint Review Panel Agreement (A2X0I0), pp. 6-7*

276. In *Jackpine Mine*, the JRP refused to hear a constitutional question about the adequacy of Crown consultation for a number of reasons. The challenge to the consultation process was brought as an interlocutory application, before the JRP review of the project had been completed.

277. The Alberta Court of Appeal reviewed the JRP's decision and made the following relevant determinations about that JRP's jurisdiction:

> Since the Agreement clearly provides that the Joint Review Panel is not required to consider the Crown's duty to consult in determining the "public

> interest'', it cannot be argued that the Joint Review Panel is nevertheless compelled to consider any related constitutional arguments.[83]

278. Unlike the JRP in *Jackpine Mine*, the Panel has not been advised that it is not required to consider the Crown's duty to consult in determining the "public interest". The proposed project is very different from the proposed Jackpine Mine Expansion project. The proposed project engages questions relating to aboriginal title and aboriginal rights in non-treaty areas of British Columbia and poses a risk to traditional ways of life in the way the Jackpine Mine expansion does not.

279. Further, the proposed project will result in disproportionate burdens and risk compared to benefits that requires a consideration of impacts of aboriginal rights in the context of the public interest analysis. The Panel has not been directed by its constituting Agreement to ignore the Crown's duty to consult in determining public interest, and the Haisla Nation submits that it must not only consider impacts to aboriginal rights in determining public interest but must also consider the adequacy of both consultation that has occurred to date and the adequacy of the consultation process that has been established by the Crown for the proposed project.

280. In *Jackpine Mine*, the Alberta Court of Appeal agreed with the JRP's determination that it would be premature to consider whether the Crown had complied with its duty to consult:

> The Joint Review Panel's determination that it is premature to consider the proposed constitutional question at this time is not a question of law, and is not subject to appeal. It is, in any event, entitled to great deference. There would be no point in considering whether the Crown has complied with its duty to consult, when the Crown itself acknowledges that it has not done so, and the Joint Review Panel has concluded that the consultation process is continuing, and that the hearing itself is part of that process.[84]

281. As in *Jackpine Mine*, the consultation process for the proposed project is ongoing. The review of the proposed project has reached a different stage, however, that the Jackpine Mine expansion review had:

> The Joint Review Panel held that even if it did have jurisdiction to consider whether the Crown had discharged its duty to consult, it would be premature to consider that question at this stage. Joint Review Panel agreed with the submissions of Alberta and Canada that the hearing on the Jackpine mine was itself a part of the duty to consult. Both levels of government were counting on the Joint Review Panel to make recommendations about the accommodation of aboriginal interests that would enable the Crown to discharge its obligation to consult. As counsel for Shell put it, with respect to the stay application, the applicants' argument was essentially ''stop the consultation, because there hasn't been enough consultation''. Even if this Court was to conclude that the Joint Review Panel did have jurisdiction to consider the proposed

[83] *Jackpine Mine, supra*, para. 11.
[84] *Jackpine Mine, supra*, para. 14.

> constitutional questions, it is clear that the Joint Review Panel has decided not to do so at this stage.[85]

282. Unlike the JRP in *Jackpine Mine*, the Panel is at the stage of the review of the proposed project having been completed, and at making recommendations. The Haisla Nation has submitted evidence about its aboriginal rights and title, about current use of resources for traditional purposes, about its aspirations for the use of its aboriginal title lands, about it stewardship obligations, and about Haisla Nation cultural heritage. The Haisla Nation has also set out in this submission its evidence and concerns about the potential impacts of the proposed project on Haisla Nation aboriginal rights and title, and on Haisla Nation cultural heritage.

283. In *Innus de Ekuanitshit, supra*, the JRP relied on the mitigation proposed by the proponent, Nalcor, to determine there would be not significant adverse effects on the Ekuanitshit's rights. In reviewing the decision to authorize proceeding with the project, the Court found that the government's duty to consult had been substantially satisfied by the proposed mitigation, but distinguished the adverse impacts on the Ekuanitshit's rights from those of another Nation who claimed aboriginal title.

284. The aboriginal rights and title issues before the Panel, and the extent to which they have or have not been addressed, are far more complex than the infringement alleged by the Ekuanitshit. Further, the Panel has a much broader mandate than the JRP in *Innus de Ekuanitshit*.

285. Consideration of the duty to consult is within the mandate of the Panel. There is nothing in the documents constituting the Panel or governing consultation for the proposed project that prevents the Panel from assessing strength of claim, degree of impact, the scope of consultation required, and the adequacy of consultation to date.

286. The federal *Aboriginal Consultation Framework* for the proposed project contains the following language:

> The JRP will include in its report information provided by Aboriginal groups regarding the manner in which the project may affect potential or established Aboriginal and treaty rights. In the case of potential Aboriginal rights, the JRP will also include the information provided by the Aboriginal groups regarding the Aboriginal groups' strength of claim respecting Aboriginal rights. The JRP may include in its environmental assessment report recommendations for appropriate measures to avoid or mitigate potential adverse impacts on potential or established Aboriginal and treaty rights and interests.
>
> The JRP will not be mandated, however, to make final determinations about the strength of an Aboriginal group's claim respecting Aboriginal rights. The federal government will make this final determination, and will ensure that it meets its legal duty to consult and, where appropriate, accommodate.
>
> *Exhibit E9-6-10, p. 8*

[85] *Jackpine Mine, supra*, para. 12.

287. The Panel is specifically enjoined only from making final determinations about the strength of an Aboriginal group's claim respecting Aboriginal rights. The Panel is not prohibited from assessing the scope of consultation that is required, or the adequacy of the consultation that has taken place to date. Further, the Panel is permitted to make preliminary determinations of strength of claim.

288. In *Rio Tinto*, *supra*, the Supreme Court of Canada identified the prospect of government establishing tribunals that are prevented from assessing adequacy of consultation:

> The fact that administrative tribunals are confined to the powers conferred on them by the legislature, and must confine their analysis and orders to the ambit of the questions before them on a particular application, admittedly raises the concern that governments may effectively avoid their duty to consult by limiting a tribunal's statutory mandate. The fear is that if a tribunal is denied the power to consider consultation issues, or if the power to rule on consultation is split between tribunals so as to prevent any one from effectively dealing with consultation arising from particular government actions, the government might effectively be able to avoid its duty to consult.
>
> As the B.C. Court of Appeal rightly found, the duty to consult with Aboriginal groups, triggered when government decisions have the potential to adversely affect Aboriginal interests, is a constitutional duty invoking the honour of the Crown. It must be met.[86]

289. This situation does not exist here. The Panel is not confined by the statutes constituting it in a way that prohibits it from assessing the adequacy of consultation. Further, the federal Crown has conflated its consultation with the JRP review process, thereby squarely placing the issue of adequacy of consultation before the Panel. The review of the proposed project and the submissions of interveners have raised issues related to the adequacy of both the consultation that has occurred to date and the future consultation process outlined by the Crown. The Panel cannot undertake an assessment of this important element of public interest.

290. The BC Court of Appeal decision in *Kwikwetlem, supra,* reviewing whether the Utilities Commission had an obligation to assess adequacy of consultation when a future environmental assessment review and decision were still pending**,** is instructive:

> The Commission's constitutional duty was to consider whether the Crown's constitutional duty of consultation had been fulfilled with respect to the subject matter of the application. Thus, before it certified the ILM Project as necessary and convenient in the public interest, it was required to determine when the Crown's duty to consult with regard to that project arose, the scope of that duty, and whether it was fulfilled. The Commission did not look at its task that way or undertake that analysis. It decided that the government had put in place a process for consultation and accommodation with First Nations that required a ministerial decision as to whether the Crown had fulfilled these legal obligations before the ILM Project could proceed and that the Commission should defer to that process.

[86] *Rio Tinto, supra*, paras. 62-65.

> As I will explain, I am persuaded the reasons expressed at paras. 52 to 57 for the conclusion reached at para. 51 in *Carrier Sekani* apply with equal force to an application for a CPCN and the Commission erred in law when it refused to consider the appellant's challenge to the consultation process developed by BC Hydro. However, in anticipation of that potential conclusion, the respondents asked this Court to step back from a narrow view having regard only to the Commission's mandate, and to find that, in this case, the Commission both acknowledged and fulfilled its constitutional duty when it deferred consideration of the adequacy of BC Hydro's consultation and accommodation efforts to the ministers' review on the EAC application. In my view, the nature and effect of the CPCN decision obliged the Commission to assess the adequacy of the consultation and accommodation efforts of BC Hydro on the issues relevant to the s. 45 proceeding. The Commission's refusal to consider whether the honour of the Crown was maintained to the point of its decision was based on a misunderstanding of the import of the relevant jurisprudence and was unreasonable.[87]

And:

> The Crown's obligation to First Nations requires interactive consultation and, where necessary, accommodation, **at every stage** of a Crown activity that has the potential to affect their Aboriginal interests. In my view, once the Commission accepted that BCTC had a duty to consult First Nations regarding the project it was being asked to certify, it was incumbent on the Commission to hear the appellants' complaints about the Crown's consultation efforts during the process leading to BCTC's selection of its preferred option, and to assess the adequacy of those efforts. Their failure to determine whether the Crown's honour had been maintained up to that stage of the Crown's activity was an error in law (emphasis added).
>
> …
>
> If consultation is to be meaningful, it must take place when the project is being defined and continue until the project is completed. The pre-application stage of the EAC process in this case appears to have synchronized well with BCTC's practice of first seeking a CPCN and not making formal application for an EAC until a CPCN is granted. The question the Commission must decide is whether the consultation efforts up to the point of its decision were adequate.[88]

291. The Haisla Nation submits that the Panel is required to assess the adequacy of consultation up to and at this **recommendation stage** of project review. Further, given the extensive evidence before the Panel about aboriginal rights that will be impacted by the proposed project, including the Haisla Nation's aboriginal title, and the Crown's proposed consultation process, it is incumbent upon the Panel, as part of its public interest consideration, to assess whether the Crown's proposed consultation process is reasonable to address outstanding issues.

[87] *Kwikwetlem supra*, paras. 13-14.
[88] *Kwikwetlem, supra*, para. 62 and 70.

292. Although Canada has stripped the Panel of its decision-making power through mid-review legislative changes, the Panel is tasked with making recommendations to government about the potential impacts of the proposed project on aboriginal rights. Such recommendations cannot be made in a vacuum. The Panel will be required to make a preliminary determination of strength of claim, if it is to fulfill its statutory mandate: in order to be fully informed about the potential impacts of the proposed project on aboriginal rights, the Panel must assess the information provided about those rights, determine the strength of claim for those rights, understand how those rights will be impacted, and determine whether proposed mitigation can address the concerns regarding impacts to rights. This necessarily requires an assessment of the consultation that has occurred to date, and identifying concerns relating to future promised consultation.

12.2 Findings Requested

293. On the basis of the evidence submitted by the Haisla Nation, NG and the federal government, the Panel should make the following findings:

1. **The Panel should find that the Haisla Nation has a very high strength of claim to its Territory, and that it has provided clear, cogent, and persuasive evidence of exclusive use and occupation of its Territory that pre-dates 1846.**
2. **The Panel should find that Haisla Nation members rely on the lands, water, and resources of Haisla Nation Territory in the exercise of their aboriginal rights, and that the exercise of these rights entail fishing, hunting, trapping, and gathering in both the Haisla Nation Territory and, more specifically, in the *wa'wais* which will be impacted by the proposed project.**
3. **The Panel should find that Crown consultation with the Haisla Nation up to this point has not been adequate.**
4. **The Panel should find that the proposed Crown consultation process raises serious doubts about whether it can be meaningful and whether it can be relied on to discharge the honour of the Crown.**

III THE ECONOMIC BENEFIT AND THE ECONOMIC BURDENS

1. Overview of the Haisla Nation's Submissions on "Public Interest" Matters

294. Section 52 of the *NEBA* requires the National Energy Board to make a determination with respect to "the present and future public convenience and necessity" of the proposed project, and whether the proposed project is in the Canadian public interest.

295. The Haisla Nation submits that the proposed project is not in the overall Canadian public interest.

296. A pipeline should be approved only if its benefits are demonstrated to exceed its burdens. The Haisla Nation submits that the proposed project, as applied for, is not in the public interest. Even if focussing solely on the economic factors, the burdens that will likely result from the proposed project will substantially outweigh the purported benefits. The evidence in support of this proposition is organized to focus a discussion on the following:

- The proposed corporate structure is intended to limit Enbridge Inc.'s liability and any other Funding Participant's potential liability. If an oil spill results in large scale harm, limited partners would be protected because only their initial investment is at risk. Canadian taxpayers (i.e., the Canadian public) could be burdened with costs associated with a spill.
- Even if the focus is solely on the economic factors, NG has failed to submit information that is adequate and sufficient to analyze its *Application for the Condensate Import Pipeline and Associate Facilities* (the "*Condensate Pipeline Application*"). NG has not provided sufficient information to assess the economic basis of the supply, transportation, markets and financing in relation to NG's *Condensate Application*.
- With regards to the Oil Export Line, methodological deficiencies or inconsistencies in the Muse Stancil and Wright Mansell's analyses indicate that the purported net benefits to producers and predicted public benefits are overstated. As a result, the current analyses provide an inflated, as opposed to an accurate and reliable, depiction of the proposed project's purported benefits.
- The evidence filed in support of the proposed project understates the economic, environmental, and social burdens that will likely result from the proposed project. When these burdens are taken into consideration, they significantly outweigh the purported benefits from the proposed project. For this reason, the Haisla Nation respectfully requests the Panel to recommend that approval for the proposed project be declined.

297. As an outline, in this portion of its submissions, the Haisla Nation will:

- summarize the components of review in this instance;
- address concerns relating to the proposed corporate structure;
- identify substantive deficiencies in NG's Condensate Pipeline Application;
- focus on key methodological deficiencies in Muse Stancil's economic analysis of the predicted netbacks to producers;

- identify material methodological deficiencies in Wright Mansell's economic analysis of the purported public benefits; and
- state its understanding of the "public interest" analysis that guides the Panel;
- address key burdens, to the Canadian public and to the Haisla Nation that were excluded from, or not fully acknowledged in, NG's evidence.

2. Components of a Public Interest Review for the Proposed Project

298. Section 52(2) of the *NEBA,* states the Board shall have regard to all considerations that appear to be related to the pipeline and to be relevant, and may have regard to the following:

(a) the availability of oil, gas or any other commodity to the pipeline;

(b) the existence of markets, actual or potential;

(c) the economic feasibility of the pipeline;

(d) the financial responsibility and financial structure of the applicant, the methods of financing the pipeline and the extent to which Canadians will have an opportunity to participate in the financing, engineering and construction of the pipeline; and

(e) any public interest that in the Board's opinion may be affected by the issuance of the certificate or the dismissal of the application.

3. Corporate Structure Risk to the Public in the Case of a Spill

299. NG's corporate structure limits Enbridge Inc. and Funding Participants'[89] liability. When NG incurs large losses from an oil spill, limited partners would be protected because only their initial investment is at risk. To the extent cost associated with an oil spill exceeds these initial investments, this corporate structure can shift the actual cost of clean-up from these companies onto the Canadian public.

300. Northern Gateway intends to distribute all net income to limited partners on an annual basis.[90]

Mr. Carruthers, Transcript Vol. 79, line 27226

301. As a result, NG will not build internally generated funds which would be available in the event of a major pollution event. There will be no, or limited, retained earnings to draw upon in the event of an incident when NG is liable.

302. Northern Gateway Pipelines Inc. is the general partner to Northern Gateway Pipelines Limited Partnership. Northern Gateway Pipelines Inc. is a distinct corporate entity from Enbridge.

Exhibit B1-4, p. 33
Exhibit B128-2, p. 2

[89] To the extent that Funding Participants elect to become a limited and general partner subsequent to approval of the proposed project by the Panel.
[90] NG's earnings potential is based on the toll rates it charges to committed and uncommitted shippers.

303. Based on this corporate structure, losses incurred from liability when NG has a large oil spill cannot be allocated to Enbridge. As a limited partner, only Enbridge Inc.'s initial investment would be at risk. As a general partner, only Northern Gateway Pipelines Inc.'s ability to generate cash flow from operations is at risk.

Exhibit D4-2-49, p. 29

304. Based on a business model where NG will distribute its net income, and a corporate structure where NG, Enbridge Inc., and the Funding Participants'[91] liability is limited, the Canadian public is at risk of bearing the actual cost of cleaning up a large spill.

4. Northern Gateway Underestimates the Costs of a Spill and the Need for Insurance

305. NG overestimates its ability to detect and respond to a spill. As a result, NG underestimates the cost of a spill, and the insurance and financial assurances required to cover these costs. Without sufficient insurance and financial assurances in place to cover a major or catastrophic event, the proposed project poses a potential financial burden to the Haisla Nation and the Canadian public.

306. Based on its own analysis, NG states the most costly pipeline incident is a full-bore rupture, with a cost of approximately $200 million. According to NG's expert, $250 million of liability insurance would therefore be an "adequate term" for the proposed project.

Exhibit B113-2, p. 5
Dr. Ruitenbeek, Transcript Vol. 96, line 19987

307. NG's proposed liability insurance coverage of $250 million is not an adequate level of liability coverage. As a protection for Canadians, and the Haisla Nation, NG should be required to obtain a minimum of $1 billion of liability coverage, through insurance and financial assurances, to ensure that all costs associated with a spill will be covered, and not shifted into Canadian taxpayers.

Ms. Allan, Transcript Vol. 80, line 28920

308. NG's proposed level of liability insurance is significantly lower than the clean-up costs Enbridge incurred in Marshall, Michigan. According to the United States National Transportation Safety Board (NTSB), Enbridge's cost of clean-up had exceeded US$767 million (as of July of 2012). Since then, NG has incurred additional clean-up costs.

Exhibit D80-69-3, p. 144
Mr. Underhill, Transcript Vol. 96, lines 19921-19922

309. In relation to Enbridge's $767 million in clean-up costs in Marshall, Michigan, NG's proposed $250 million for liability insurance for the proposed project is grossly inadequate.

310. NG has provided evidence that suggests clean-up costs in the United States are, on average, three times higher than elsewhere in the world. When asked about whether the

[91] To the extent that Funding Participants elect to become a limited and general partner subsequent to approval of the proposed project by the Panel.

costs in excess of $42 million incurred by the US federal government (as of April 2012) on the spill at Marshall, Michigan would be included in clean-up costs, NG confirmed that they would. NG also suggested that the US Natural Resources Damages Assessment framework, which is a process to ensure responsible parties pay for clean-up and remediation, is responsible for higher clean-up costs in the US.

Dr. Ruitenbeek, Transcript Vol. 96, lines 19895-19937

311. Due to the numerous factors discussed below, the costs of cleaning up a spill in the Kitimat River Valley could be significantly greater than the clean-up associated with Enbridge's Marshall, Michigan spill.

312. Clean-up costs in remote areas or into rivers are more costly than for non-remote spills. The Kitimat River Valley is remote, by comparison to the Marshall, Michigan area. In contrast to the existing road infrastructure and resources available in Michigan, the proposed project will traverse undeveloped areas, with infrequent or no access points. As a result, the cost of accessing, containing, and cleaning up a major or catastrophic spill in a remote site will likely be greater than in Michigan.

Dr. Ruitenbeek, Transcript Vol. 96, lines 19956-19963

313. By comparison to Marshall, Michigan, the terrain features and seasonal conditions in the Kitimat River Valley also present a significantly more challenging, and therefore costly, setting to respond to a spill. The flows for the Kitimat River, for example, are significantly higher than even the maximum flows of the Kalamazoo River.

Mr. Underhill, Transcript Vol. 96, line 20095

314. The Kitimat River and its tributaries are subject to volatile changes in flow and the Kitimat Estuary is affected by significant tidal ranges. The dynamic nature of the Kitimat River means that a spill into these areas could be exceptionally difficult, and costly, to contain and control.

Mr. Underhill, Transcript Vol. 96, lines 20030 and 20060

315. A spill, particularly a large uncontained spill, in the Kitimat River Valley, would have detrimental effects. The Kitimat Estuary is a high consequence area. It is used for both domestic water supply and for industrial water supply. The Kitimat River is home to the Federal Fish Hatchery. Due to the sensitivity of this area, as a key water source and as critical habitat, the costs associated with a spill will likely be substantial.

Mr. Underhill, Transcript Vol. 96, lines 20064-20068

316. NG justifies its need for minimal insurance coverage based on its proposed risk prevention and mitigation measures.

Mr. Carruthers, Transcript Vol. 72, lines 18239-18241, 18319 and 18571

317. While risk prevention and mitigation measures are important and necessary, they are not a substitute for insurance and financial assurances that would cover the clean-up and damages of a major or catastrophic event. Also, as discussed in detail in the discussion of

pipeline accidents and malfunctions at paras. 785 to 791 and 876 to 897 below, NG's proposed risk prevention and mitigation measures are inadequate and insufficient to prevent a spill.

318. NG states that "the most costly pipeline incident is a full-bore rupture". NG also states that the maximum release from a full-bore rupture is based on a 10-minute spill detection time, followed by a 3-minute valve activation time. It is therefore presumed that the most costly full-bore rupture contemplated by NG in estimating clean-up costs is one which is detected and shut down in 13 minutes.

Exhibit B113-2, p. 5
Exhibit B75-2, p. 30

319. For the reasons set out in the discussion of leak detection limitations at paras. 876 to 890 below, NG has profoundly overestimated its ability to detect and respond to a spill. By overestimating its ability to detect a spill, NG has underestimated the costs of a spill, and the insurance and financial assurances need to cover these costs.

320. In the alternative, if Northern Gateway has accurately stated that the maximum release for a full-bore rupture is based on a 10-minute spill detection time, followed by a 3-minute value activation time, its ability to contain, control, and clean up the spill is contingent on being able to access it. If a spill were to occur in the Kitimat River Valley, lack or road access, volatile and inclement seasonal conditions, and challenging and dangerous watercourse conditions, could prevent NG from containing, controlling and cleaning up the spill. These conditions and natural features mean that costs associated with a spill in the Kitimat River Valley will likely be greater than predicted by NG.

321. NG used "Typical Clean Up Costs" to calculate the clean-up cost for a spill. Typical Clean Up Costs are estimated to be slightly higher ($4,000/bbl) than NG's "Expected Clean Up Costs (Upper Bounds)" ($3,532/bbl) and the "North American Average Clean Up Costs" ($3,686/bbl).

Exhibit B83-4, p. 139

322. These figures are all within the range of the average North American clean-up costs. The treacherous terrain, inclement weather, and seasonal volatility that defines the Kitimat River Valley is neither typical nor representative of North American pipeline settings. Consequently, NG's predicted clean-up costs are not reflective of the true costs of cleaning up a spill in the Kitimat River Valley. To the extent that NG has underestimated its clean-up costs, it has also underestimated its need for insurance and financial assurances.

323. NG is seeking "to procure insurance on a stand-alone basis so no other projects or operations beyond Northern Gateway would be covered under that program." Additionally, Northern Gateway intends to distribute all net income to limited partners on an annual basis. As a result, NG should be required to obtain a minimum of a billion dollars of liability coverage, through insurance and financial assurances, to ensure that all costs associated with a spill will be covered, and not shifted into Canadian taxpayers.

Exhibit B113-2, p. 4
Mr. Carruthers, Transcript Vol. 79, line 27226

Ms. Allan, Transcript Vol. 80, line 28920

324. NG was asked whether Enbridge Inc. would guarantee its share of potential financial obligations commensurate with its ownership share in Northern Gateway. NG advised that Enbridge Inc. would not make this commitment.

Exhibit B119-1, p. 1

325. The fact that Enbridge is unwilling to provide a parent company guarantee suggests that it is not convinced that the proposed project is a low risk, based on its own harm projections. If Enbridge was convinced that the proposed project has a low risk, then withholding a parent guarantee would not be necessary.

326. Notably, Enbridge does not operate a pipeline in areas that have the terrain and seasonal climatic characteristics of the Kitimat Valley watershed.

Mr. Underhill, Transcript Vol. 96, line 20024

327. Enbridge's refusal to offer to provide a parent company guarantee is disturbing. It is certainly in Enbridge's private interest to protect itself from liability through a limited liability structure. This approach shifts the actual costs of clean-up away from the company and over to the public. If clean-up and compensation costs exceed both Northern Gateway Partnership's insurance and other available funds, Enbridge Inc. would not address these costs and the Canadian public will bear them (to the extent clean-up occurs).

328. To the extent that NG requires assistance from the Canadian government when responding to a spill, or is incapable of cleaning up a spill, these costs will be borne by Canadian taxpayers. As a protection for the Haisla Nation and the Canadian public, NG should be required to obtain a minimum of a billion dollars of liability coverage, through insurance and financial assurances, to ensure that all costs associated with a spill will be covered, and not shifted into Canadian taxpayers. The potential condition proposed by the Panel approaches requiring the appropriate assurances, but the amount of coverage required under that condition should be increased to $1 billion.

5. NG has the Burden of Justifying Both of its Applications

329. NG has submitted separate applications for its Condensate Import Line and Oil Export Line. NG has the burden of proving that each of these Applications separately and independently meet the criteria set out in s. 52 of the *NEBA.*

330. NG has applied for:

- a Certificate of Public Convenience and Necessity pursuant to Section 52 of the *National Energy Board Act* (NEB Act), authorizing the construction and operation of the oil pipeline and associated facilities, including tankage and terminal at Kitimat, BC;

- a Certificate of Public Convenience and Necessity pursuant to s. 52 of the NEB Act, authorizing the construction and operation of the condensate pipeline and associated facilities, including tankage and terminal at Kitimat, BC; and

- an Order pursuant to Part IV of the NEB Act approving the toll principles applicable to service on each of the oil and condensate pipelines, including tankage and terminal at Kitimat, BC.

Exhibit A31-1, p. 6

331. NG envisages that the Condensate Import Pipeline and the Oil Export Pipeline could proceed independently of the other.

Mr. Fisher, Transcript Vol. 78, lines 26810-26811

332. Funding Participants have the option to purchase equity in either one or both of the pipeline projects.

Mr. Fisher, Transcript Vol. 72, line 18435

333. The current Funding Participants are not legally bound to enter into long-term shipping agreements.

Mr. Van Heyst, Transcript Vol. 80, line 29831

334. The economic viability of the Condensate Import Line and Oil Export Line could be compromised if current Funding Participants elect to "walk away" from one of these two pipelines. Without a guarantee that long-term shipping agreements will be executed, which is the current case, it is not possible to determine whether either of the proposed pipelines are economically viable.

335. NG has the burden of proving that its Application for the Condensate Import Pipeline and its Application for the Oil Export Pipeline separately and independently meet the criteria set out in s. 52 of the *NEBA.* The Panel's mandate, pursuant to s. 52 of the *NEBA,* is to review each of these Applications and provide a recommendation as to whether or not a certificate should be issued for all or any portion of the pipeline.

6. NG Has Not Demonstrated that the Condensate Import Pipeline is in the Public Interest

336. NG has applied for an independent s. 52 certificate for the Condensate Import Pipeline. NG has not, however, demonstrated that the Condensate Import Pipeline is, independent of the Oil Export Pipeline, economically viable. NG has not provided sufficient information about available sources of supply, established a need for this pipeline, or proven that this pipeline is in the public interest.[92] Without this information, the Panel is not in a position to recommend for approval NG's Application for the Condensate Import Pipeline.

6.1 Lack of Evidence of a Likely Long-term Supply of Condensate

337. The condensate pipeline is designed with an average annual throughput capacity of 193,000 barrels per day.

Exhibit B1-2, p. 13

[92] As required by the *NEB Filing Manual*, "Guide A.3 – Economics".

338. The marine terminal will accommodate the transfer of imported condensate out of tankers into storage facilities and onto the pipeline.

Exhibit B1-2, p. 13

339. NG relied on information from Poten and Partners to analyze the Pacific Rim condensate supply.

Exhibit B1-4, p. 12

340. NG did not commission another study in relation to condensate markets, or the implications of condensates economics on the oil and gas industry.

Dr. Mansell, Transcript Vol. 75, line 22895

341. NG did not file Poten and Partners' report as evidence; it provided only a brief summary of it in the Application and in its Response to JRP Information Request 2.3.

Exhibit B1-4, p. 13 and 20
Exhibit B49-2, p. 1

342. Despite requests from an Intervenor for Poten and Partners' full report to be filed as evidence, NG did not file it. NG did not cite any confidentiality or other reasons explaining why it would not be able to file the full report.

Exhibit D4-13-2, p. 1 at 1(c) and 10

343. NG did not call a witness that could speak directly to Poten and Partners' analysis. The individuals comprised of NG's Panel could not answer specific questions regarding Poten and Partners' analysis.

Mr. Fisher, Transcript Vol. 71, lines 17040-17042

344. Parties were deprived of the opportunity to test material aspects of the Poten and Partners' research. The Poten and Partners' report was not filed and hence is not evidence and has no probative value. Its contents could not be tested for reliability. NG's references to Poten and Partners' report should be ascribed no weight.

345. Pursuant to s. 52(2)(a), NG has the onus of proving "the availability of oil, gas or any other commodity to the pipeline". NG has made no attempt to determine if sufficient sources of condensate are available to fill the Condensate Import Pipeline. NG's Application is inconsistent with s. 52(2)(a) because it has not provided evidence that a stable, long-term supply of condensate is available for the Condensate Import Pipeline.

346. Condensate supply is highly variable and availability depends on:

- global natural gas production;
- petrochemical demand;
- refinery and condensate splitter demand;
- disruptions in producing countries; and
- demand from heavy oil producers.

Exhibit B49-2, p. 2

347. Changes in these variables affect global supply. It is therefore difficult to forecast the amount of condensates that will be available to the North American market.

Mr. Fisher, Transcript Vol. 71, line 17003

348. NG's assumes that condensates will be available over the life of the Condensate Import Line but has not provided any evidence that a stable supply of condensates will be available.

> **We had no information base to substantiate anything in terms of an input [for condensates].** That would be similar to, for example, the results from the Muse Stancil study for crude oil. We simply assume that there would be flows. They -- it could be just simply a substitution of supplies from the U.S. or a substitution of supplies from elsewhere from -- for supplies that come through the U.S. **We just don't know.** …. (emphasis added)

Dr. Mansell, Transcript Vol. 71, lines 17109-17110

349. NG has not done the work necessary to determine whether condensate will be available for the pipeline. It has left that issue for shippers to determine. Shippers will not undertake this analysis until after the proposed project is approved.

> **17004.** That decision on the amount of condensate and where that condensate will be sourced from will be made by the Gateway shippers prior to them executing their transportation service agreement on the condensate import pipeline.

Mr. Fischer, Transcript Vol. 71, line 17004

350. NG's Application is inconsistent with s. 52(2)(a) of the *NEBA.* NG has not proven that a stable, long-term supply of condensate is available for the Condensate Import Pipeline.

6.2 Mischaracterization of Existing or Potential Transportation Infrastructure

351. NG asserts that there is a shortage of condensate supply and condensate pipeline infrastructure in Canada. NG's Application does not, however, accurately depict the condensate transportation options available, or likely to be available, for condensate imports.

352. NG argues that there is "an apparent market shortfall approximating the delivery capacity of the Project's condensate pipeline".

Exhibit B1-4, p. 22

353. When considering condensate transportation options, NG's Application acknowledges that the Enbridge Southern Lights line imports 29,600 m^3/d (186 kbpd) of condensate from Illinois to Edmonton.

Exhibit B1-4, p. 22

354. NG's Application fails to note Southern Lights' potential increase in capacity to import condensates into Canada. The CAPP 2011 Forecast states that the Southern Lights condensate line "can be expanded to 330,000 b/d with minor looping and to over 400,000 b/d with full looping."

Exhibit B31-4, p. 31

355. With minor looping, Southern Lights could import 150,000 b/d more of condensates; with full looping, Southern Lights could import 220,000 b/d more of condensates.[93] NG's Condensate Import Pipeline is designed to import 193,000 b/d. With full looping, Southern Lights would completely replace the need for the Condensate Import Pipeline, and with minor looping, satisfy the majority of the supply from the Condensate Import Pipeline. The potential expansion of Southern Lights existing pipeline infrastructure puts into question the need for NG's Condensate Import Pipeline.

356. Alternatives to a project (when an environmental assessment is triggered), include "any feasible different methods for the transportation of gas … including possible pipeline expansions or looping by other proponents."[94] NG did not consider the expansion of the Enbridge Southern Lights condensate line as an alternative in its proposed project.

357. Further, contrary to the Filing Requirements, NG did not describe the need for this pipeline, fully examine other economically-feasible alternatives to the project, or provide a rationale for need for the Condensate Import Pipeline in light of these alternatives. By failing to consider the expansion of the Southern Lights condensate light, NG fails to adequately consider the condensate transportation infrastructure.

Filing Manual, Chapter 4 (Physical Projects), Section 4.2.2; Filing Manual, Subsection A.2.3 (Scope of the Environmental and Socio-Economic Assessment); *Canadian Environmental Assessment Act, s. 16(1)(2)*

358. By ignoring the opportunities to increase the amount of condensate imported through Southern Lights, NG does not consider whether the Condensate Import Pipeline could create excessive capacity and lead to a surplus of condensate within the market. NG has not considered the economic repercussions that result from either of these scenarios. By failing to consider these scenarios, NG's Application fails to considered whether real or potential markets exist for the Condensate Import Pipeline, and is inconsistent with s. 52(2)(b) of the *NEBA*.

[93] The CAPP 2011 Forecast states that "The initial capacity of the diluent import line is 180,000 b/d". The numbers provided are based on the initial capacity being 180,000 b/d. (Minor Looping: 330,000 – 180,000 = 150,000; Full Looping: 400,000 – 180,000 = 220,000).

[94] According to *Emera, supra,* this position is consistent with: The Joint Public Panel Review Report, Sable Gas Projects, October 1997 (Sable); Comprehensive Study Report GH-3-97, Alliance Pipeline Project, September 1998 (Alliance), Although the Board is not bound by its past decisions, these decisions may provide some assistance to parties in determining how the Board has consistently addressed these factors in the past. Also: Sharp v. Canada (Transportation Agency), [1999] F.C.J. No. 948 (FCA).

6.3 The Demand for Imported Condensates Has Not Been Analyzed

359. Section 52(2)(b) refers to "the existence of markets, actual or potential". NG has not filed evidence that adequately proves the existence of actual or potential condensate markets in relation to the Condensate Import Pipeline. Specifically:

- the execution of precedent agreements does not indicate industry based demand for condensates;
- discrepancies in NG's Application and testimony create uncertainty about the industry's demand for imported condensates;
- NG's failure to account for methodological differences in CAPP's forecasts overstates the market demand for condensates; and
- NG has not considered the extent to which market demand will be affected by the economic impact of the imported condensate in Canada.

360. Support for these arguments is set out below.

6.3.1 Precedent Agreements Are Not Evidence for Market Demand

361. Precedent agreements describe the events or circumstances that must occur before a commitment to ship or pay for capacity on a pipeline will take contractual effect (through the execution of transportation service agreements (TSA)).

Exhibit B1-4, p. 27

362. Precedent agreements are not binding on NG or shippers. Shippers who have entered into precedent agreements may elect not to execute a binding TSA.

Mr. Van Heyst, Transcript Vol. 80, line 29831

363. Shippers entered into precedent agreements based on a strategic outlook of the market, not based on a solid understanding of whether the proposed pipeline was consistent with their future plans.

Mr. Houston, Transcript Vol. 80, lines 29804-29805

364. Total E&P Canada Ltd. described the proposed project as "a long shot". Yet, NG is relying on its precedent agreements as evidence of demand.

Mr. Houston, Transcript Vol. 80, lines 29804-29805
Mr. Fisher, Transcript Vol. 70, line 15570
Mr. Fisher, Transcript Vol. 71, line 17125

365. NG's precedent agreements should not be construed as evidence of market demand because shippers:

- have not analyzed the sourcing potential for condensate or production needs; and

- will make a decision to execute the Transportation Service Agreement *after* regulatory approval is obtained and *after* undertaking an extensive analysis on sourcing options and production needs.

  Mr. Fisher, Transcript Vol. 71, lines 17125-17127

366. When questioned whether a holder of a precedent agreement intends to enter into a firm TSA with Northern Gateway, shippers reiterated that they would have to assess the economic feasibility of the proposed project before executing:

> In the case of Total, for a commitment of $1 billion, we go all the way to our Executive Committee in Paris and **we have a rigorous internal review process that we would have to follow up through the management chain to get a decision. It would involve an analysis of our view of the opportunity, the cost, and the risk and risk mitigation involved with the decision to go ahead** (emphasis added).

Mr. Houston, Transcript Vol. 81, line 30258

And:

> From Nexen's perspective, **clearly we have to understand the capital cost estimate and then that relative to the economic benefit**. And understanding of the economic benefit -- and we do this on an ongoing basis -- it's understanding the markets and ensuring we understand the markets that it would give us the ability to access and what's the value there (emphasis added).

Ms. Zumwalt, Transcript Vol. 81, line 30259

Also:

> From the Cenovus perspective, I mean, what we've negotiated is a whole package with the rights and obligations and the risks and rewards that come with that package. And for us, **in evaluating equity participation, it would be understanding everything that's unfolded to that point in time, what the costs are ultimately going to be on the pipe, what the projected in-service date is, what kind of strategic deliberations we might have done in examining that** (emphasis added).

Mr. Dembicki, Transcript Vol. 81, line 30263

367. Shippers are at a preliminary stage of evaluating whether they will enter into long-term TSAs. The commercial viability and feasibility of the proposed project depends on the execution of long-term binding contracts. The proposed project's commercial viability rests on shippers' willingness to enter into long-term binding contracts and, to date, shippers have not entered into long-term binding contracts.

368. According to Mr. Priddle, NG's witness, the Panel has placed significant weight on the presence of completed firm service agreements:

> **27404.** And I'll say this on the record: it has been the Board's practice ever since the Express Pipeline proceeding to consider that the presence of completed firm service agreements is the central indication of need for a particular facility and the certificate that would govern it.
>
> *Mr. Priddle, Transcript Vol. 79, line 27404*

369. Precedent agreements are not evidence of completed firm service agreements and should not be construed as such.

370. Shippers have entered into precedent agreements, which merely describe the events or circumstances that must occur before a commitment to ship or pay for capacity on a pipeline will take contractual effect. Precedent agreements are not evidence of market demand. Precedent agreements, at best, reflect a project that shippers consider a "long shot". They are neither a marker of shippers' demand, nor the commercial viability or feasibility of the proposed project. NG's reliance on its precedent agreements is misguided.

6.4 The Financial Aspects of the Condensate Import Pipeline Are Unknown

371. NG's Pro Forma Financial Statement does not reflect the nature of NG's separate s. 52 applications for the Condensate Import Line and Oil Export Line. NG's aggregated Pro Forma Financial Statement prevents the Panel from determining whether each pipeline is independently financially viable, because toll rates have not been calculated on the basis of each project proceeding separately.

372. NG's Pro Forma Financial Statement aggregated the capital and operating costs for the condensate and oil pipelines and related marine facilities.

> *B1-4, pp. 34 and 35*
> *Exhibit B31-4, p. 1*

373. If the pipelines proceed together, then NG can benefit from the synergies around constructing and operating both pipelines at the same time.

> *Mr. Fisher, Transcript Vol. 78, lines 26814-26815*

374. NG envisions the pipelines proceeding independently of one another. If the pipelines do not proceed at the same time, then there will be no cost synergies, and each pipeline will bear its own full costs of construction.

> *Mr. Fisher, Transcript Vol. 78, lines 26810-26811*

375. Because NG has provided an aggregated Capital and Operating Budget, there is no information available for the cost associated with building each pipeline separately. The toll rates for each pipeline are based on aggregated budgets, not on the toll rates that would be required on a stand-alone basis. No estimates have been provided to reflect the toll rate costs if only the Oil Export Pipeline portion or only the Condensate Import Pipeline portion of the proposed project is built.

376. NG states that the tolls will be recovered on a "stand-alone basis".

Exhibit B1-4, pp. 33 and 34
Exhibit B31-2, p. 15
Exhibit B31-8, p. 1

377. This statement should not be confused with tolls that reflect the Capital and Operating Costs of stand-alone projects. NG estimated toll rates for the Oil Export Pipeline and the Condensate Import Pipeline are based on an aggregated—or Project basis—Capital and Operating Budget and then allocated to each pipeline. Consequently, if only one of the two pipelines is built, then the toll rates for that pipeline will be higher than predicted because there are no construction cost synergies. Increases in toll rates directly affect the financial viability of that pipeline.

378. NG should have provided capital, operating and toll rate estimates under three potential scenarios, if:

- the oil pipeline is constructed and operated as a stand-alone project;
- if the condensate pipeline is constructed and operated as a stand-alone project; and
- if both pipelines are constructed and operated together.

379. NG's aggregated Pro Forma Financial Statement prevents the Panel from determining whether each pipeline is independently financially viable and what the corresponding toll rates for each pipeline would be in the absence of the other.

380. Without a Capital and Operating Budget for each pipeline, it is not possible to determine whether NG's Condensate Import Line or Oil Export Line is economically feasible or whether there is an appropriate method of financing each pipeline. By failing to provide this information, NG's applications are inconsistent with s. 52(2)(c) and (d) of the *NEBA.*

6.5 NG's Condensate Import Pipeline Application is not Consistent with Section 52 of the *NEBA*

381. NG has not provided sufficient information to assess the economic basis of the supply, transportation, markets, and financing in relation to the Condensate Import Pipeline. In summary, NG:

- has not provided evidence that establishes a likely long-term supply of condensate;
- understated existing or potential infrastructure to import condensates into Canada;
- failed to analyze the demand for condensates it proposes to import; and
- failed to provide evidence on the financial viability of the Condensate Import Pipeline.

382. According to the National Energy Board:

> The unequivocal failure of an applicant to satisfy the Board on a single critical component (such as, for example, the ability to finance the project) may be enough for the Board to conclude that, on that fact alone, the project cannot be found to be in the public convenience and necessity. However, such failure on a single factor is unlikely. More common is the situation presented to the Board by this application, where the evidence in one or more of the areas of examination is stronger than that presented with respect to other relevant matters or than has been presented in other applications. In such cases, the

> Board will, on the basis of the evidence before it and within the specific circumstances of each application, apply administrative discretion and expertise in its overall determination of whether the applied-for pipeline is required by the present and future public convenience and necessity.[95]

383. In the present case, NG has not met the majority of the threshold requirement of s. 52 of the *NEBA* with respect to its application for a certificate for the Condensate Import Pipeline. The evidence provided by NG with regards to the Condensate Import Line is deficient and incomplete. The Panel does not have enough information to recommend the approval of the Condensate Import Pipeline under s. 52 of the *NEBA*.

384. **Finding Requested: The Panel should recommend against the issuance of a s. 52 certificate for the Condensate Import Line.**

7. Relationship Between Capital and Operating Budgets, Toll Rates, Netbacks, and Net Producer Benefits

385. An accurate Capital and Operating budget is required to assess the commercial viability, economic feasibility and public benefits of the proposed project. Northern Gateway has not provided Capital and Operating Budgets that reflect the full costs of the proposed project. Without an accurate and updated Capital and Operating budget, NG's estimated toll rates for the oil and condensate pipelines will be underestimated and the Net Producer Benefit will be inflated.

386. NG engaged Muse Stancil "to assess the netback benefits that would accrue to Canadian oil producers (in all provinces) as a result of the project connecting Canadian oil production to new markets" (the "Net Canadian Producer Benefit").

> *Exhibit B1-4, p. 23*
> *Exhibit B83-3, p. 7*

387. To determine the Net Canadian Benefit, Muse Stancil adjusted the Gross Canadian Producer Benefit for the effect of the higher crude prices on Canadian refiners and then netted off Northern Gateway's tolls. This calculation is illustrated in Table 4 (see Appendix I).

388. Capital and Operating budgets trigger toll rates.[96] An accurate assessment the Capital and Operating budget is necessary for determining the toll rate and the Net Canadian Producer Benefit.[97]

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[95] *NEB Reasons for Decision, AEC Suffield Gas Pipeline Inc., GH-2-2000, August 2000, p. 23.*

[96] According to NG: "The tolls for the oil pipeline will be designed to recover the costs of developing, constructing and operating the oil pipeline and related facilities on a stand-alone basis. The tolls for the condensate pipeline will be designed the same way" (*Exhibit B1-4, p. 29).*

[97] NG has only included the tolls associated with the oil pipeline in this analysis. This conclusion is based on dividing the number of barrels a year into the toll rate total in the Table, above. The only toll rates that could be included are the oil ones. For example, in 2019, 500,000 barrels a day are transported for 365 days divided into the $687.5 billion toll rate figure provided gives an average toll rate of $3.76. Muse Stancil has never provided the details as to the toll rates assumed for committed or spot, or how they may have adjusted the $3.68 toll rate for 2016 into a 2012 figured (per Table 3).

389. NG has not provided an accurate estimate of its Capital and Operating budget. As discussed at paras. 371 to 380 above, NG's aggregated Capital and Operating Budget does not reflect the nature of its separate s. 52 Applications.

390. Additionally, NG's Capital and Operating Budget does not represent an accurate accounting of the proposed project because it is based on an unclassified estimate. This unclassified estimate has not gone through the review required for a Class III estimate.

Mr. Doering, Transcript Vol. 91, line 12495

391. Increases in the cost of developing, constructing and operating the oil pipeline and the condensate pipeline will lead to increases in tolls. Northern Gateway originally estimated the 2016 average Term Shipper tolls to be $3.21 per barrel for the Oil Export Pipeline and $4.88 per barrel for the Condensate Import Pipeline. These toll estimates were calculated using the following assumptions:

- Throughput would be 79,494 m^3/d (500,000 bpd) on the oil pipeline and 27,823 m^3/d (175,000 bpd) on the condensate pipeline.
- The total project capital cost would be $5.54 billion (Q4, 2009 Canadian dollars).
- Operating expenses for the first five years would be as outlined in Section 4.3.

Exhibit B1-4, p. 31

392. Subsequently, NG revised the Toll Principle, increasing the return on equity from 11% to 12%. Due to these changes, the tolls were increased from $3.21/bbl to $3.68/bbl for crude and from $4.88/bbl to $5.23/bbl for condensate.

Exhibit B31-2, p. 14

393. These toll rate revisions were based on the original $5.54 billion (Q4 2009 Canadian dollars) aggregated capital budget submitted in the original application, and an updated set of Pro Forma statements reflecting certain changes.

Exhibit B 31-2, p. 15

394. The Capital and Operating Budget for the proposed project is now estimated at $6.57 billion (2009 dollars). This updated budget is based on additional costs for "Marine Infrastructure" and "Design Enhancements".

Exhibit B137-2, pp. 9-10
Dr. Mansell, Transcript Vol. 76, line 23315

395. The costs associated with NG's tank terminal design changes to increase the number of tanks or with additional commitments or potential conditions have not been included in the $6.57 billion estimate.

396. The current $6.57 billion Capital and Operating Budget represents an increase of approximately $1.03 billion since the proposed project's original capital and operating budget. Despite the magnitude of this increase, no adjustments to toll rates have accompanied this revised budget.

397. Toll rate estimates for the proposed project impact the economic feasibility, commercial feasibility and public benefits. Tolls are a cost borne by oil producers when they export crude oil and import condensate. An increase in toll rates will directly reduce producer netbacks and reduce the economic benefits predicted by NG. Since the toll rates provided by NG do not represent the proposed project's expanding capital and operating costs it is not possible to accurately determine what the proposed project actually represents in terms of its economic feasibility, commercial feasibility and public benefits.

8. NG Has Failed to Demonstrate Benefit of Oil Export Pipeline

8.1 NG Has Failed to Prove the Economic Feasibility of the Oil Export Pipeline

398. Muse Stancil provided two reports, originally the *Market Prospects and Benefit Analysis for the Northern Gateway Project* (the "*Market Prospects Report*"), and then subsequently, the *Update of Market Prospects and Benefits Analysis for the Northern Gateway Project* (the "*Market Prospects Update*").

399. Methodological inconsistencies and deficiencies in the Muse Stancil's analysis include:

- The aggregation of price lift benefits, even after the pipeline is assumed to be operating at capacity, fails to recognize that once the Oil Export Line is at full capacity, price discounts will return.
- The assumption that a fixed exchange rate will exist for the life of the project is unjustifiable. When oil prices drive up the Canadian dollar, net producer benefits fall.
- The presumption of the permanent Asia premium is not supported and fails to consider how its erosion will lower netbacks to producers.

400. Muse Stancil's assessment of netbacks to producers is unreliable, and of little assistance to the Panel, because of these flaws.

8.1.1 Muse Stancil's Model Continues to Aggregate Benefits After the Pipeline is Full

401. Muse Stancil's analysis assumes that the supply of crude oil from western Canada is the same with or without the proposed project. Muse Stancil's analysis is flawed because it continues to aggregate price lift benefits even after the pipeline is assumed to be operating at capacity. Once the Oil Export Line is at full capacity, price discounts will return. Extending the calculation of the economic benefits beyond this timeline inflates the economic benefits from NG's oil pipeline.

Exhibit B1-4, p. 83

402. Muse Stancil runs its linear programming model every year, treating each year as its "own unique base case", as if Northern Gateway was not built, and then as if Northern Gateway was built in that year.

Mr. Earnest, Transcript Vol. 70, lines 15863-15866

403. To calculate the Net Canadian Producer Benefit from Northern Gateway, Muse Stancil measures the difference in crude oil prices when the oil pipeline re-directs supply from Canadian and US to Asian markets. Based on this methodology, price lifts occur over the life of the proposed project.

404. The underlying premise is that if crude oil supply flowing to North American markets is reduced because oil producers can access higher prices in Asian markets, the price for crude oil would be expected to rise. The price should rise, however, only until the pipeline is full.

405. NG concedes that once a pipeline is full, it ceases to act as a price setting mechanism. Once a pipeline is full, it cannot move an incremental barrel and ceases to act as the price-setting mechanism.

> A current example of this dynamic is the Pegasus Pipeline…This pipeline has been operating at capacity for a number of years…if Pegasus was the current price-setting mechanism, Canadian heavy crude should be trading at about $7.00/bbl under the price of a similar heavy crude on the Gulf Coast…Clearly, the Pegasus pipeline…is not acting as the price-setting mechanism for Canadian heavy crude, **no more than Northern Gateway would be if it was operating at its capacity** (emphasis added).
>
> *Exhibit B83-3, p. 34*
> *Mr. Earnest, Transcript Vol. 70, lines 15886-15889*

406. Once NG is full, it will not act as a price setting mechanism:

> Once Northern Gateway is full, higher Asian crude prices cannot further increase shipments on Northern Gateway (although the shippers may benefit), and Northern Gateway is no longer acting as the price-setting mechanism for Western Canadian crude. **If Northern Gateway is full, some other transportation mode and perhaps market must be acting as the price-setting mechanism for Western Canadian crudes** (emphasis added).
>
> *Exhibit B83-3, p. 34*

407. Once the pipeline is pumping at full capacity, price discounts return. If the price discounts return, net economic benefits only exist to the extent that a pipeline is able to move the incremental, or marginal, barrel to market, to alleviate the price discount.

> *Mr. Earnest, Transcript Vol. 70, lines 15882 and 15886-15887*

408. Muse Stancil's methodology is flawed, and conflicts with Mr. Earnest's direct evidence, because it continues to aggregate price lift benefits even after the pipeline is assumed to be operating at capacity. Muse Stancil's methodology fails to recognize that once the Oil Export Line is at full capacity, price discounts will return. Extending the calculation of the economic benefits beyond this timeline inflates the economic benefits from Northern Gateway's oil pipeline.

409. Muse Stancil's methodological error is confirmed by the Government of Alberta evidence. The Government of Alberta recognizes that once the oil pipeline is full it can no longer

provide netback improvements and the benefits that can be ascribed to NG's oil pipeline cease. In the absence of other market solutions (for example, upgrading and refining in Alberta and/or new transportation alternatives) netbacks to producers fall.

410. According to Dr. Harold York, author of the Government of Alberta's evidence, the oil pipeline provides a one-time, short-term solution to improving netbacks:[98]

> **2000. [MS. CHAHLEY:]** … is it fair for me to understand that what you're saying here is, really, the only solution to this problem [an $8 discount] would be to have a far greater West Coast option, that **Northern Gateway isn't sufficient by itself to be a solution to this problem, except that we've identified for one year**.
> **2001. DR. HAROLD YORK: That's correct** (emphasis added).
>
> *Dr. York, Transcript Vol. 80, lines 1999-2004*

411. The Oil Export Pipeline is only a price setting mechanism until the pipeline is full. Muse Stancil Net Canadian Producer Benefit is inflated because it continues to aggregate the predicted benefits after the pipeline is full.

412. The magnitude of Muse Stancil's error can be estimated in two ways. The first method is to compare Muse Stancil's net producer benefits until the pipeline is operating at capacity (for the years 2018 – 2021) against Muse Stancil's Net Producer Benefit for the years 2018-2035. The difference is $33 billion—or an error of 324%.[99]

413. The second method for assessing the magnitude of Muse Stancil's error is to compare Muse Stancil's Gross Producer Netback estimate to the Gross Producer Netback estimate provided in the Government of Alberta's Reply Evidence prepared by Wood Mackenzie.[100]

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[98] The Government of Alberta commissioned Wood Mackenzie to prepare "A Netback Impact analysis of West Coast Export Capacity." This report is not a measure of the public interest benefit from the project. (*Hearing Transcripts, Volume 82, Lines 234 – 237)* and should not be relied on to determine the netbacks received by Canadian producers. This report fails to incorporate:

- the cost to Canadian refineries from increased heavy oil feedstock prices;
- a reflection of accurate or reliable toll rates and their impact on netbacks;
- the economic impact of the condensate import pipeline on diluted bitumen economics;
- exchange rate sensitivity and supply dynamics.

Wood Mackenzie estimates a Gross Producer Benefit of $8 billion - $12 billion arising from west coast pipeline access (*Exhibit E8-6-4, p. 9).* Despite undertaking a similar analysis (*Hearing Transcript, Volume 83, Lines 2101 – 2122*), Wood Mackenzie's estimate is substantially lower than Muse Stancil's Gross Producer Benefit estimate of $67.1 billion.

[99] This estimate is based on the evidence provided in Exhibit B83-3, p. 7, p. 10, Table 3. By 2022 the oil pipeline is running at capacity. The Net Producer Benefit 2018 – 2021 is $10.2 billion compared to Net Producer Benefit 2018 – 2035 of $43.2 billion. The error is $33 billion in excess net benefits to producers—a magnitude of error of 324%.

[100] Wood Mackenzie Reply evidence citation of $8 – $12 billion. Gross Producer Benefit is chosen because the Government of Alberta only provided an estimate of the Gross Producer Netback impact, not a net producer netback impact.

The Muse Stancil estimate is $55.1 - $59.1 billion greater than evidence provided by the Government of Alberta—an error of roughly 470%.[101]

414. Muse Stancil's Net Canadian Producer Benefit should be given no, or greatly diminished, weight because of the magnitude of this error. Muse Stancil's Net Canadian Producer Benefit is grossly inflated, rendering its analysis unreliable and of no, or limited, assistance to the Panel.

415. Since the annual producer benefit estimated by Muse Stancil is utilized by Wright Mansell to calculate economic impact, the accuracy and reliability of the Muse Stancil netback to producers is crucial to the accuracy and reliability of the Wright Mansell analysis as well. As discussed, Muse Stancil's failure to recognize that the netback benefits cease when the pipeline is operating at capacity is a major methodological error and substantially over-estimates the impact of Northern Gateway on producer netbacks. This error feeds into the economic impact of the proposed project, as estimated by Wright Mansell, rendering Wright Mansell's analysis unreliable and inaccurate.

8.1.1.1 Alternative Argument: NG Does Not Consider Market Response to Re-Allocation of Supply

416. NG represents a reallocation of crude from Canadian and US markets to Northeast Asian markets over the life of the proposed project. As an alternative argument, if NG has correctly predicted price lifts due to this re-allocation of supply, Muse Stancil's model continues to be flawed because it does not account for the market's response to this price lift. An increase in the price of crude oil in North America would stimulate an increase in production in order to capture this price lift. The effect of this increased production would be to lower the price lift.

417. NG assumes that the supply of crude oil is the same with or without Northern Gateway. NG predicts a sustained $2.04 to $3.00 increase in Canadian oil prices because the supply of crude is re-directed from the North American market to the Asian market.

Exhibit B1-4, p. 83
Exhibit B83-3, p. 47
Exhibit B1-4, p. 23

418. In the initial year of operation, Muse Stancil's original evidence reveals that Northern Gateway will divert 40,000 bbl/d of crude from Ontario and Quebec and 400,000 bbl/d of crude oil from the US. This represents a 23% decline in total western Canadian supply from Canadian markets, and a decline of 15% of supply from US markets.[102]

Exhibit D4-2-49, p. 51

[101] Exhibit B83-3, Table 3, p.7, Gross Producer Benefit 2018 – 2035 from Muse Stancil of $67.1 billion compared with Wood Mackenzie of $8 – $12 billion (Exhibit E8-6-4, p. 9).

[102] This calculation is based on Exhibit B1-3, Table A-11 and Table A-14 in 2016 Ontario and Quebec distribution declines by 26.2 kb/d for Sweet Synthetic, 11.8 kb/d Canadian conventional, and 1.9 kb/d for All Heavy Grades to equal a decline of 39.9 kb/d, or 23%. In the U.S., distribution declines by 202.9 kb/d Sweet Synthetic, increases by 11.8 kb/d for Canadian conventional, and declines by 199.5 kb/d for All Heavy Grades to equal a decline of 391 kb/d, or 15%. Muse Stancil does not explain why these numbers do not equate to (are lower than) their throughput figures in Table A-8.

Exhibit D4-2-03, p. 4 and B1-4, Tables A-9 to A-14

419. During the ten-year period from 2016 to 2025, the restriction of crude oil supply resulting from Northern Gateway is an average of 20% in Canada and 14% in the US.[103]

Exhibit B1-4, Tables A-9 to A-14, p. 94-102

420. Muse Stancil's model is flawed because it does not account for the market's response to or the effects of reallocation of supply away from the North American market.

421. An increase in the price of crude oil in North America would stimulate an increase in production and hence, supply. This increase in crude oil supply would find its way to North American markets because of the limited access due to Northern Gateway. An increase in supply would work to lower North American prices. Based on this market dynamic, enhanced netbacks resulting from higher prices because of Northern Gateway would be expected to be short lived under a flexible, rather than fixed, supply scenario.

422. If NG has correctly predicted a price lift due to a re-allocation of supply, Muse Stancil's model is flawed because it does not account for the market's response to this price lift. If the proposed project creates a price increase, then this price increase would stimulate production in order to capture this price lift. This would have the effect of reducing the price lift.

8.1.2 The Value of the Canadian Dollar Impacts the Size of the Net Canadian Producer Benefit

423. NG's assumption that a fixed exchange rate will exist for the life of the project is unjustifiable. When oil prices drive up the Canadian dollar, net producer benefits fall. Muse Stancil's Net Canadian Producer Benefit is flawed, and inflated, because it fails to account for the impact of an appreciating Canadian dollar on producers.

424. NG assumes that the value of the Canadian dollar will be fixed and unaffected by market forces throughout the time horizon of its analyses. This fixed exchange rate assumption is maintained in Muse Stancil's and Wright Mansell's original and reply evidence.[104]

425. Muse Stancil did not explain why it assumed a constant exchange rate or why the rate was changed to par in the Market Prospects Update. Wright Mansell only states that "based on long-term productivity differences, the long run exchange rate should be around $1Cdn-$0.85US."

Exhibit B83-3, Table A-5, p. 57

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[103] A re-distribution of supply calculation as undertaken in footnote 102 was developed for each year and an annual average calculated.

[104] Exhibit B1-4, p. 85. By taking Muse Stancil's Net Producer Benefit of "CA$28 billion through 2025" as a ratio of the US $23.7 through 2025 from Table 7, the exchange rate utilized for the entire period is $1.0CDN/$0.85US." In Exhibit B83-3, p. 5, the exchange rate was changed to 1.0/1.0 (par) for all years.
Exhibit B1-4, p. 149. Wright Mansell assumed the Canadian dollar depreciates by one cent a year from 1.0/0.91 in 2010 to 2015 where it remains at 0.85 US for more than 30 years. In Exhibit B83-4, p. 47, Wright Mansell assumed an exchange rate of 1.0/1.0 in 2012 falling to 1.0/0.95 by 2015 and remaining at that level until 2048.

426. NG also assumes the nominal price of oil will double from 2012 to 2035.[105]

> *Exhibit B83-3, Table A-5, p. 57*
> *Exhibit B83-4, p. 47*

427. In light of NG's assumption that the nominal price of oil will double, NG's position regarding a constant exchange rate is not justifiable. An increase in the price of oil causes the Canadian dollar to appreciate. According to the NEB:

> Energy prices influence economic conditions in Canada. In particular, the global crude oil price has influenced the exchange rate, especially in recent years. **As the crude oil price moved higher, such as in the first half of 2008, the Canadian dollar has appreciated against the American dollar. Similarly, the currency has tended to depreciate when crude oil prices fall** (emphasis added).
>
> *Exhibit B114-2, p. 19*

428. A rising Canadian dollar means lower economic returns. According to the NEB, "[t]he exchange rate is also important, because oil exporters are paid for their product in U.S. dollars and a rising Canadian dollar means lower economic returns".[106]

> *Exhibit B114-2, p. 39*

429. When the Canadian dollar appreciates because of higher oil prices, Muse Stancil's predicted Net Canadian Producer Benefits will decrease. The following example illustrates how an appreciation of the Canadian dollar driven by higher oil prices causes the Net Canadian Producer Benefit to erode. According to Ms. Allan:

    1. The price of sweet synthetic crude is $98US/bbl;
    2. The exchange rate is $1US = $1.18 Canadian, or $1CDN = $.85US;
    3. Producers receive the equivalent of $115.64 for every barrel they sell;
    4. Northern Gateway becomes operational and the price of sweet synthetic crude rises by roughly $2.00US, as predicted;
    5. A vibrant natural resource sector, stimulated in part by the higher netback prices due to Northern Gateway, begins to put upward pressure on the Canadian dollar;
    6. The Canadian dollar rises by 2 cents and now the Canadian dollar is worth 87 cents US or $1 US = $1.15 Canadian;

[105] NG anticipates the price of oil will increase 2% per year in nominal terms and 26% in real terms between 2012 and 2035. The price of WTI at Cushing, for example, in 2012 is $89.68 increasing to $112.64 in 2012 dollars. In nominal dollars it reaches $178.18, or 99% greater than in 2012. Exhibit B83-3, Table A-5 and Exhibit B83-4, p. 47.

[106] It should be noted that the Panel recognizes the important role the value of the Canadian dollar plays, and its relationship to oil prices, but the NEB Forecast submitted as evidence by NG does not adjust for this sensitivity in any meaningful, or dynamic way, and hence the NEB Forecast suffers from the same lack of feedback mechanism as the CAPP Forecast.

7. The producer benefit from Northern Gateway is eroded by the appreciation of the Canadian dollar because a barrel of sweet synthetic, which now sells for $100 US is only worth $115 Canadian. In fact, on a Canadian dollar equivalent basis, the producer is receiving less money per barrel than before Northern Gateway (in this example, 64 cents a barrel less).

   Exhibit D4-2-49, p. 63

430. This example illustrates that the Gross Producer Benefit (and the purported Net Canadian Producer Benefit) from the proposed project are highly sensitive to exchange rate fluctuations. When the Canadian dollar appreciated by 2.35% the Gross Producer Benefit was eroded.

431. NG's assumption that a fixed exchange rate will exist for the life of the project is unjustifiable. When oil prices drive up the Canadian dollar, net producer benefits fall. Muse Stancil's Net Canadian Producer Benefit is flawed, and inflated, because it fails to account for the impact an appreciating Canadian dollar on producers.

8.1.3 Project's Price Lifts are Contingent on the Existence of the Asia Premium

432. Muse Stancil presumes the Asia premium will exist over the life of the proposed project. This presumption is not supportable. Muse Stancil's analysis is overstated because the gross netback benefit of the project will fall as the Asia premium erodes.

433. NG assumes that accessing the Asian markets will allow Canadian crude producers to capture a price benefit. Because of the "Asia premium":

> … the Canadian crude producer can access a higher priced market (Northeast Asia) at the same, or lower, freight cost, [so] the producer captures a price benefit at Edmonton due to Northern Gateway.

   Exhibit B1-4, p. 54

434. Muse Stancil forecasts that the Asia premium will persist over the life of the proposed project.

   Exhibit B1-4, p. 82

435. This forecast is an output of Muse Stancil's analysis of key market variables on the U.S. Gulf Coast and Singapore that act to generate a crude and product price set for both markets.

   Exhibit B83-3, p. 33

436. Muse Stancil's forecast for the Asia premium is unreliable. A comparison of Muse Stancil's forecast for the Asia premium, against the actual price of the Asia premium (only available for 2010 and 2011), shows that its forecasts are not within reasonable realm of accuracy.

Figure 1: Projected and Actual Asia Premium Prices and Spreads – 2011 ($US)

Asia Premium based on Arab Heavy	**2010 Forecast**	**2010 Actual**	**Forecast Error**
	$2.29	$1.18	-$1.11 or - 48%
	2011 Forecast	**2011 Actual**	**Forecast Error**
	$2.75	$0.81	-$1.94 or -71%

Source: Exhibit B1-4, p. 93; Exhibit B83-3, p. 59

437. Muse Stancil's forecast of the Asia premium for 2010 and 2011 was half to two thirds lower than what actually happened. This degree of deviation shows that Muse Stancil's forecasting model is deeply inaccurate and unreliable in the short-term. These discrepancies are likely to be exacerbated over Muse Stancil's long-term forecast (that continues until 2035).

438. Further, NG has not explained why a permanent Asia premium will exist over the life of the proposed project. According to Tom Gunton, Professor and Director of the Resource and Environmental Planning Program at Simon Fraser University, a permanent Asia premium is unlikely:

> …market forces should reduce if not eliminate the premium as world producers redirect oil to the higher price markets, until netbacks are equalized. There can be short-term premiums caused by transportation or supply constraints, but a permanent premium is unlikely unless it is cost based.
>
> *Exhibit D35-22-2, p. 23*

439. If the determination of crude oil prices in the international marketplace responds to the changing market forces of new sources of supply for Asian refiners, then it is reasonable to anticipate the Asia premium will narrow or disappear altogether as other countries, including Canada, seek to take advantage of it.

> *Exhibit D4-2-49, p. 59*

440. As illustrated in *Figure 1*, above, in the short term, Muse Stancil's forecast already over-predicts the price of the Asia premium. Muse Stancil's failure to consider the erosion of the Asia premium, and how its erosion will affect netbacks to producers, is a significant error.

441. As much as 85% of the projected gross netback benefit to Canadian producers is dependent upon the Asia premium.

> *Exhibit D4-2-49, p. 59*

442. If 85% of the projected gross netback benefit to Canadian producers is dependent on the Asia premium, and the Asia premium erodes over the life of the proposed project, then

the proposed project predicted gross netback benefit could be overstated by up to 85 percent. Muse Stancil's analysis is flawed and basically unreliable because it fails to consider the erosion of the Asia premium.

8.1.4 Summary of the Haisla Nation's Submissions Regarding Muse Stancil's Analysis

443. Muse Stancil's Net Benefit suffers from the following methodological flaws:

- the aggregation of price lift benefits, even after the pipeline is assumed to be operating at capacity. Once the Oil Export Line is at full capacity, price discounts will return.
- the assumption that that a fixed exchange rate will exist for the life of the project is unjustifiable. When oil prices drive up the Canadian dollar, net producer benefits fall.
- the presumption of the permanent Asia premium is not supported and fails to consider how its erosion will lower netbacks to producers.

444. Muse Stancil's assessment of netbacks to producers is unreliable, and of little assistance to the Panel, because of these flaws.

8.2 Canadian Public Benefit Analysis

445. NG commissioned Wright Mansell to "quantify the magnitude of the benefits that would accrue to all Canadians from the Project proceeding."

Exhibit B1-4, p. 23

446. Wright Mansell originally prepared a report titled *Public Interest Benefits of the Enbridge Northern Gateway Pipeline Project* (the "*Public Benefits Report*"), and subsequently the *Public Interest Benefits Evaluation of the Enbridge Northern Gateway Pipeline Project: Update and Reply Evidence* (the "*Public Benefits Update*").

447. According to the *Public Benefits Report*:

> Over a 30-year operating period, Canadian gross domestic product (GDP) would increase by $270 billion. Additional labour income would be $48 billion, as a result of an additional 558,000 person years of employment. Finally, the federal and provincial governments would collect an additional $81 billion in revenue.

Exhibit B1-4, p. 23

448. Wright Mansell's analysis is flawed, and unreliable because it:

- assumes that netbacks to producers will continue until 2048, which inflates the predicted benefits to producers and to the Canadian Gross Domestic Product;
- incorporates the benefits from reinvesting in production, but not the negative effects of lower prices due to greater supply, which inflates the purported public benefits; and

- focuses on "person years of employment," as opposed to incremental or net employment benefits, which grossly mischaracterizes and overstates the employment benefits associated with the proposed project.

449. Each of these methodological flaws is discussed below.

8.2.1 Relationship between Wright Mansell's Analysis and Muse Stancil's Analysis

450. Wright Mansell based its Canadian public benefits analysis on the netback benefits predicted by Muse Stancil.

Exhibit B83-4, p. 75

451. All of the methodological flaws that corrupt Muse Stancil's netback analysis are directly incorporated into Wright Mansell's analysis. If Muse Stancil's netback benefits are incorrect and unreliable, then Wright Mansell's analysis is also incorrect and unreliable.

8.2.2 False Assumption that Price Lifts Extend Over the Life of the Project

452. Wright Mansell's public benefit analysis is flawed because it assumes that netbacks to producers will accrue until 2048 (as opposed to being limited until the pipeline is full). By assuming that netbacks to producers will continue until 2048, Wright Mansell inflates the predicted benefits to producers and to the GDP.

453. Approximately 90% of the benefits predicted by Wright Mansell's analysis are based on the higher oil prices for all Canadian crude oil that Muse Stancil attributes to building of the Oil Export Pipeline:

Table 1

Estimated Economic Benefits of the Project

Economic Impact	Northern Gateway Estimate	Due to Oil Price Increase	Share from Oil Price Increase
GDP	$270 billion	$246 billion	91.00%
Additional Labour Income	$48 billion	$43 billion	90.00%
Person Years of Employment	558000	496687	89.00%
Government Revenue	$81 billion	$77 billion	95.00%

Source: Table 1-5 Volume 2 Section Enbridge Northern Gateway Application and Response to Federal Government IR No.1

Exhibit D4-2-49, p. 8

454. Muse Stancil inflated the netbacks to producers by continuing to calculate netbacks after the pipeline is operating at capacity (as discussed at paras. 401 to 415). If Muse Stancil's price lifts are not accurate, then approximately 90% of Wright Mansell's predicted public benefits are unsubstantiated.

455. Wright Mansell also extrapolates the price uplifts Muse Stancil predicted. Wright Mansell takes the price uplift Muse Stancil predicted in 2035 and assumes these price lifts will remain constant between 2035 and 2048.

Exhibit B83-4, p. 50

456. Wright Mansell does not justify for why these price uplifts will remain at the 2035 value. As discussed at paras. 401 to 415, price lifts should not be attributed to Northern Gateway after the pipeline is at full capacity.

Exhibit B83-4, p. 50

457. By assuming that price uplifts exist, and remain at Muse Stancil's 2035 value, Wright Mansell adds a total of $55.4 billion Canadian (with $4.26 billion Canadian annually between 2036 and 2048) to Muse Stancil's price lift estimates of $59.4 billion Canadian between 2018-2035 to arrive at $114.8 billion Canadian Net Revenue Uplift. The benefits are not supportable and should be excluded from the predicted public benefits.[107]

458. Had Wright Mansell incorporated only the price lift benefits until the pipeline reaches capacity, then the predicted producer net benefit would be roughly 483.3%[108] lower. Based on the figures Wright Mansell used in the Public Benefits Update, the enhanced GDP would be closer to $49.3 billion, instead of $252 billion.[109]

459. Wright Mansell's public benefit analysis is flawed because it assumes that netbacks to producers will accrue until 2048 (as opposed to being limited until the pipeline is full). By assuming that netbacks to producers will continue until 2048, Wright Mansell inflates the predicted benefits to producers and to the GDP.

8.2.1.1 Alternative Argument: Wright Mansell's Economic Analysis Does Not Consider the Consequences of a Price Increase Every Year

460. Wright Mansell adopts the purported price lifts from Muse Stancil for 2018-2035, and extends the price lifts each year to 2048, based on the estimates developed by Muse Stancil for 2035. As an alternative argument, if Wright Mansell is correct and price lifts will exist as predicted, its analysis is still flawed and unreliable because it does not consider the impact of the price lift on the Canadian economy each year because of Northern Gateway.

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[107] *Exhibit B83-4, p. 51, Table 2.4* provides the Canadian dollar equivalent of Muse Stancil's Gross Producer Benefit minus the refinery impact (but not excluding toll rate costs). Wright Mansell calculates the Net Revenue Uplift to equal $114.8 billion and identifies $4.26 billion as the annual amount it adds to Muse Stancil's estimates. $4.26 billion x 13 years = $55.38 billion. $114.8 billion - $55.4 billion = $59.4 billion.

[108] During the period prior to the oil pipeline operating at capacity Muse Stancil predicted $10.2 billion in aggregated Net Producer Benefit, as compared to $43.2 billion during the period 2018 – 2035. Wright Mansell adopted these figures, extended the analysis to 2048, and predicted an increase in GDP of $280 billion as explained in Exhibit B83-4, page 54, Table 3.1. The price lifts account for 90% of the estimated GDP growth, which means $252 are directly attributable to Muse Stancil's predicted price uplift. A rough approximation of the material error is to take the percentage growth of $43.2 billion from $252 billion, which results in 483.3% difference. $10.2 billion increased by 483.3% yields $49.3 billion.

[109] The 2018 – 2021 net producer benefit $10.2 billion increased by 483.3% yields $49.3 billion.

461. Muse Stancil has developed its price lift estimates by running its model, each year, with and without Northern Gateway, and Wright Mansell relies on these estimates as input into its Input Output Model, the impact of the price lift estimates is as if prices rise every year because of Northern Gateway. This is tantamount to an inflationary impact, which has not been considered in the analysis. Failing to account for this inflationary impact of this price lift overstates the predicted benefits of the proposed project.[110]

462. As a general principle, inflationary impacts occur within the Canadian economy when a sustained increase in prices coincides with a fall in the real value of money. Similarly, higher oil prices, without a corresponding change in real economic output (such as production), create inflation.

Exhibit D4-2-3, p. 4

463. The reason why the price lift adopted by Wright Mansell for input into its model behaves as if it is a sustained increase in prices is because Wright Mansell's model is run relying on higher oil prices each year because of Northern Gateway.

464. NG assumes that the supply of crude oil from western Canada is the same with or without the proposed project. Consequently, there is no new real economic activity upon which real economic growth and development can be based. The only change offered in the analysis is higher prices for each barrel produced because Northern Gateway is built.

Exhibit B1-4, p. 83
Exhibit D4-2-3, p. 4

465. According to the Application, over the 10-year period after project start-up, Muse Stancil estimates that sweet synthetic crude prices would rise on average $2.04/bbl more each year than if the proposed project were not to proceed, and Athabasca dilbit prices would increase on average by $3.00/bbl each year.

Exhibit B1-4, p. 23

466. Since the price increase is presumed to exist over the life to the proposed project, the negative consequence of the annual increase in prices on the Canadian economy must be considered when assessing the economic impacts of the proposed project.

Exhibit D4-9-2, pp. 46-47

467. The negative impacts arise as refineries pass the annual price lifts from Northern Gateway onto consumers and businesses. Consumers and businesses must respond to higher oil prices (because of Northern Gateway) by shifting consumption and spending from one part of their budget to another. When the transfer occurs a decline in demand is felt among industries and within communities.

Exhibit D4-2-49, p. 11

[110] Wright Mansell's Input-Output Model is a static model incapable of considering the impacts of higher oil prices on the Canadian economy when they are passed on by refineries to consumers and businesses in the form of higher petroleum product prices (Exhibit D4-2-49, p.19-21).

468. The extent of the negative impact on the Canadian economy from the price lifts cannot be incorporated; Input Output model Wright Mansell utilized is incapable of doing so.

Exhibit D4-2-49, pp. 19-21

469. If a price lift is calculated as a benefit for every year of the project, then the corresponding cost on the Canadian economy from these price lifts should also be accounted for.

470. If Wright Mansell is correct and price lifts will exist between 2018 and 2048, its analysis is still flawed and unreliable because it does not consider the inflationary impact of the annual price lift on the Canadian economy. By failing to consider the annual impact of the price lift on the Canadian economy, NG's evidence overstates the predicted benefits of the proposed project.

8.2.3 Distortions in Wright Mansell's public benefits analysis: Benefits Resulting from Reinvestments Not Justifiable

471. Wright Mansell distorts the purported public benefit estimate because it selectively incorporates the benefits from reinvesting in production without the negative effects of lower prices due to greater supply. By including only the benefits from reinvesting in production, Wright Mansell inconsistently applies the assumption that the total Canadian oil sands production remains unchanged.

472. Wright Mansell assumes that the total Canadian oil sands production remains unchanged.

> This Northern Gateway Case assumes that total Canadian oil sands production remains the same as in a benchmark forecast (the CAPP "Expected" forecast). However, in the Northern Gateway Case some Canadian oil exports that would otherwise go into U.S. markets are sent to Asian markets. **While total Canadian oil sands production volumes are unchanged**, there is an increase in the value of this production which would benefit Canadian oil producers. **The incremental net revenues from this would in part be reinvested and generate further gains to output**, employment, incomes and government revenues in Canada (emphasis added).

Exhibit B1-4, p. 131

473. Wright Mansell's analysis is flawed because it selectively applies the assumption that oil sands production remains unchanged. In one instance it calculates the price uplift because of the redirection of an unchanged amount of supply, but in another, it calculates the benefits that result in an increased amount of supply:

> **14939.** Finally, with the reinvestment in the oil and gas industry, typically the way to view it is that you get more production than would otherwise be the case. **If you don't reinvest a large percentage of the revenue, you would find your production declining. By continuing to reinvest, the idea is to stabilize or perhaps even, hopefully, increase that production**. So it's that incremental production. Now, granted, that occurs far in the future and is less certain (emphasis added).

Dr. Mansell, Transcript Vol. 69, line 14939

474. If benefits from the proposed project are calculated on the basis that there is no new anticipated crude oil production, then this assumption must be carried forward through the entire analysis. Benefits associated with the "reinvestment price benefit" and the "production from reinvestment" should not be included because this reinvestment leads to new supply.

475. Wright Mansell's Table 11 shows that Wright Mansell overestimates the purported public benefits by $156.5 billion because it attributes CDN$44 billion as a result of a reinvestment of the price benefit and CDN$112.5 due to production from reinvestment.

Table 11

Disaggregation of the Wright Mansell Net Benefit
Used as Input into the IO Model
2016 - 2046

	CDN$ Billion	
Capital Investment	5.5	Capital budget
Operating Revenue	20.2	Revenue stream from operation
Price Benefit	107.6	Similar to Muse $28 billion +20 years
Reinvestment Price Benefit	44	40% reinvestment rate assumed
Production from Reinvestment	112.5	Expansion of output attributable to reinvestment
Total Shock to IO Model	**289.8**	Of which $264.1 due to price lift

Source: Wright Mansell Report and Response to Federal Government IR No.1.3

Exhibit D4-2-49, p. 69

476. Increases in oil supply drive down prices, which causes netbacks to fall (as discussed at paras. 416 to 422). Benefits from reinvestment should not be included as part of the public benefits analysis, *unless* the negative price impacts of increased supply are also included. By excluding the negative price impacts of increased supply, Wright Mansell distorts the purported public benefit by CDN$156.5 billion.

Dr. Mansell, Transcript Vol. 73, lines 19692-19693

477. By using the benefit of reinvestment as an input into its Input Output Model, when the price benefit input number has explicitly ignored the negative effects of that reinvestment, Wright Mansell distorts the purported public benefit estimate. Wright Mansell's analysis is flawed because it selectively incorporates the benefits from reinvesting in production without the negative effects of lower prices due to greater supply. By only including the benefits from reinvesting in production, Wright Mansell inconsistently applies the assumption that the total Canadian oil sands production remains unchanged.

8.2.4. Distortions in Wright Mansell's Public Benefits Analysis: Gross Employment Impacts versus Incremental Employment Impacts

478. Wright Mansell's analysis, which focuses on "person years of employment," as opposed to incremental or net employment benefits, grossly mischaracterizes and overstates the employment benefits associated with the proposed project. When an incremental analysis is used, there would be limited employment benefit from the proposed project. These limited employment benefits would likely translate into negligible long-term benefits.

479. According to the Application, the proposed project will result in the creation of 558,000 person years of employment and 62,700 person years of construction employment.

Exhibit B1-2, p. 16

480. In the Public Benefits Update, Wright Mansell alters these figures, estimating "[a]n increase of 907 thousand person years of employment or an average annual increase of over 27,000 person years of employment."

Exhibit B83-4, p. 56

481. When the employment benefits are considered as permanent jobs directly associated with the proposed project, the predicted benefit is significantly reduced; only 105 individuals are anticipated to be directly employed to operate and maintain the pipeline and related facilities.[111]

Exhibit B1-5, pp. 106-107

482. The failure to provide direct employment data in the public interest section leads to a significant misrepresentation of the number of jobs, and potential public benefit, that the proposed project will create.

Exhibit D35-22-2, p. 18

483. NG's Application seeks to rely on gross employment benefits rather than incremental benefits. This presumes that would-be NG employees will not otherwise find work. This is inconsistent with NG's evidence.

484. NG is considering employing foreign labour, indicating that the labour force within Canada will be unable to supply NG's employee needs because the Canadian labour force is already fully employed. NG has entered into preliminary discussions "with organized labour as well as the contractor community to manage foreign labour if necessary".

Mr. Fiddler, Transcript Vol. 87, lines 7618-7621

485. If NG employs foreign labourers, then this means that Canadians are not available because they have secured employment elsewhere within the Canadian economy. If Canadians

[111] Note that in Exhibit B32-2, p. 39, NG states that "The total number of long-term personnel is currently estimated to be 228, inclusive of both Northern Gateway personnel and associated Services personnel for Kitimat Terminal and tug operations." For the purpose of this argument, which focuses on direct benefit, this number is not used because it includes both "direct employees" and "associated services".

have secured employment elsewhere, then the proposed project does not represent an incremental benefit.

486. When incremental impacts are considered, the proposed project will generate limited benefits. The figures used in the Application and by Wright Mansell are based on gross (or total), as opposed to net (or incremental) benefits. Net impacts should be measured because they account for the incremental contribution of the proposed project to the economy.

Exhibit B1-4, p. 23
Exhibit D35-22-2, p. 20

487. NG did not ask Wright Mansell to assess the incremental employment benefits from the proposed project. Dr. Mansell confirmed that if the employment benefits from the proposed project were assessed on an incremental basis, "there may be very little incremental impact" from the proposed project.

Dr. Mansell, Transcript Vol. 76, lines 24147-24155

488. Dr. Mansell also confirmed that figures provided could be perceived "as gross over-estimates of what the net impact would be."

Dr. Mansell, Transcript Vol. 76, lines 24154-24155

489. NG should have evaluated the incremental employment benefits from the proposed project. Benefits resulting from labour and capital that would have been employed elsewhere in the economy should not be attributed to NG because there is no incremental benefit. In this context, the net benefit employment cannot be attributed to the proposed project because resources are simply reallocated between sectors and regions.

Exhibit D35-22-2, p. 20

490. Wright Mansell's analysis, which focuses on "person years of employment," as opposed to incremental or net employment benefits, grossly mischaracterizes and overstates the employment benefits associated with the proposed project. When an incremental analysis is used, there would be limited employment benefit from the proposed project. The proposed project's limited employment benefits would likely translate into insignificant long-term benefits.

8.2.5 Summary of the Haisla Nation's Position

491. Wright Mansell commits a number of methodological errors when assessing the public benefit of the proposed project. Key errors include:

- assuming netbacks to producers will continue until 2048, which inflates the predicted benefits to producers and to the Canadian Gross Domestic Product;
- incorporating the benefits from reinvesting in production, without the negative effects of lower prices due to greater supply, which inflates the purported public benefits; and

- focusing on "person years of employment," as opposed to incremental or net employment benefits, which mischaracterizes and overstates the employment benefits associated with the proposed project.

492. For these reasons, the methodology used by Wright Mansell is inaccurate and unreliable and should receive no, or diminished weight, in the public interest assessment.

9. Benefit Cost Analysis

493. The intervenor, Coastal First Nation submitted an independent benefit-cost analysis ("BCA"), prepared by Dr. Gunton and Mr. Broadbent. The objective of this BCA was to identify "all the positive and negative impacts of a project and to aggregate these impacts to determine whether a project creates a net gain or loss in society's overall well-being."

Exhibit D35-22-2, p. 25

494. The BCA calculated costs associated with the proposed project, as identified in Table 5 below, and concluded that "under no scenario will the ENGP generate a net benefit to Canada, even when including an Asian price premium". Based on a conservative estimate, the proposed project imposes a **net cost** to Canada of over $1.5 billion (2009 CAD). Under the various sensitivities, the net costs to Canada range from a cost of $362.4 million to over $2.2 billion (2009 CAD).

Exhibit D35-22-2, p. 28

Table 5: Benefit Cost Results to WCSB Oil Sector – No Social-Environmental Costs (2009 CAD)

BCA Scenario	NPV of ENGP
Base Case	**-$1,562.7**
95% Pipeline Capacity Utilization	-$1,008.6
No Keystone XL	-$362.4
10% Lower Export Volumes	-$2,249.1
10% Higher Export Volumes	-$697.9
Asian Premium	-$409.2
Employee Benefits	-$1,518.4
6% Discount Rate	-$1,424.9
10% Discount Rate	-$1,678.8
10% Lower Capital Costs	-$1,406.4
10% Higher Capital Costs	-$1,718.9
Oil Pipeline Only	-$1,142.6

*Construction and operating costs associated with the oil pipeline are estimated by the proportion of total capacity of the project used exclusively by the oil pipeline.

Exhibit D35-22-2, p. 28

495. Dr. Gunton and Mr. Broadbent's competing economic analysis provides an important alternative to NG's economic analysis, and should be taken into consideration during the Panel's public interest deliberations.

496. This BCA does not, however, analyze social and environmental costs associated with the proposed project, justifying its decision on the basis that "the preliminary assessment shows net costs to Canada without inclusion of environmental costs …". Consequently, Dr. Gunton and Mr. Broadbent's BCA's predicted burdens, although relevant to assessing NG's evidence, still underestimate the full burdens of the proposed project.

Exhibit D35-22-2, p. 28

9.1 Lost Ecological Goods and Services

497. NG has excluded, or underestimated, key social and environmental costs associated with the proposed project. These costs, including lost ecological goods and services ("EGS") and the costs associated with an oil spill or release, represent additional burdens associated with the proposed project.

9.1.1 Cost Estimates Associated with the Loss of Ecological Goods and Services

9.1.1.1 Background on Evidence Filed

498. Several intervenors filed evidence addressing the economic valuation of environmental externalities related to the proposed project.[112]

Exhibit B83-4, pp. 97-98

499. These intervenors consistently stated:

- economic values should be placed on changes to EGS;
- EGS have a high economic value, and the proposed project could lead to the complete or partial loss of these services to some stakeholders;
- values ascribed to EGS (provided through independent assessments) are greater than suggested by NG; and
- if the loss of such values were properly considered, then the economic costs of the proposed project would be considerably higher and the proposed project may not be in the public interest.

Exhibit B83-4, p. 98

500. Subsequently, in the Public Benefits Update, Wright Mansell conceded that "[t]he estimated present value of all environmental and oil spill cost expectations over the life time of the project … is $122 million (at an 8% discount rate, in the Base Case)."

Exhibit B83-4, p. 99

501. The Haisla Nation filed a report titled *Ecological Costs Associated with the Proposed Northern Gateway Pipeline* (the "*Ecological Costs Report*") that discussed and quantified some of the social and ecological costs associated with the proposed project.

Exhibit D80-27-18, p. 2

[112] Intervenors include: Gregory et al., Gunton and Broadbent, and Ruth and Gasper.

502. The *Ecological Costs Report* concluded that "Enbridge did not quantify impacts on ecosystem goods and services, and as a consequence underestimated project costs".

Exhibit D80-75-3, p. 2

503. Based on this assessment, the *Ecological Costs Report* found that:

- The combined estimates for total costs because of damage to ecosystem services over the lifetime of the proposed project (30 years) range from US$3.1 billion to US$212 billion based on choice of discount rate and cost estimates of ecosystem services.

  Exhibit D80-75-3, p. 41

- Depending on choice of discount rate, the average costs directly due to construction of the pipeline and associated infrastructure ranged from US$1.2 billion to US$2.4 billion over a 30 year assumed project lifetime (Table 17). The majority of these impacts were due to loss of forest (67%), followed by loss of wetlands (31%), grassland (2%), tourism in the Kitimat Terminal and loss of salmon for fishing.

  Exhibit D80-75-3, p. 42

- Ecological costs of Enbridge's oil spill scenarios range from US$12,000 for minor spills along the pipeline route to US$13 billion for offshore spills, depending on the spill volume, location, and duration of oil spill impacts.

  Exhibit D80-75-3, p. 41

- Total project costs are 3-200 times greater than the value of "equity" commitments Enbridge pledged to Aboriginal groups.

  Exhibit D80-75-3, p. 3

- Excluding the potential for oil spills, the average ecological cost estimates would more than triple the cost estimates reported by Enbridge.

  Exhibit D80-75-3, p. 3

- In Haisla Nation Territory, ecological costs range from US$254 million to US$775 million.

  Exhibit D80-75-3, p. 3

504. The *Ecological Costs Report* did not purport to place a value on damage to the Haisla Nation's rights and title, health and culture. Accordingly, the *Ecological Costs Report*'s cost predictions are very conservative. NG made no attempt to calculate the value on damages from the proposed project on Haisla Nation's rights and title, health and culture, so its analysis is similarly undervalued.

Dr. Ruitenbeek, Transcript Vol. 75, lines 22677-22678

505. In its Reply Evidence, NG filed a report prepared by Anielski Management titled *Evaluation of Natural Capital and Ecological Goods and Services at Risk Associated with the Proposed Enbridge Northern Gateway Pipeline* (the "*Evaluation of Natural Capital Report*"). This study examined the assumptions, methodologies, and analysis in the *Ecological Costs Report* and re-evaluated potential project impacts on the natural capital assets and EGS.

Exhibit B83-6, p. 2

506. The *Evaluation of Natural Capital Report* asserted that the total EGS losses within the PDA would have a present value of CDN $17.858 million (or US$17.665 million). The study attributes the majority (97.8%) of these losses of EGS to waste treatment, erosion control, water regulation, pollination, biological control, and subsistence food production services, with the other 2.2% related to carbon sequestration capacity losses.

Exhibit B83-6, p. 6

507. The fact that the *Evaluation of Natural Capital Report* was filed as Reply Evidence makes it clear that NG had no intention of providing evidence-in-chief that identifies costs to EGS from the proposed project. NG's Application did not account for the cost of lost EGS, which directly result from the proposed project and imposes burdens on the Canadian public. This omission is another example of how NG's Application has sought to underemphasize the costs and burdens associated with the proposed project.

508. As discussed below, the losses associated with EGS, as defined in the *Ecological Costs Report,* should be considered in an assessment of public benefits.

9.1.1.2 Discrepancies between Ruth and Gasper's and Anielski's Analysis

509. The analysis in the *Ecological Costs Report* results in different cost estimates for EGS. Key discrepancies rest on different approaches to:

- choice of project impact area; and
- per-hectare cost estimates of goods and services.

510. These discrepancies are illustrated in the following table submitted by NG:

Table 1: Summary of Key Differences Between Ruth and Gasper and Anielski

	Ruth and Gasper	**Anielski**
Total impact area used for analysis (hectares)	84,279	7,706
Total Present Value of EGS value losses estimate (US$ millions) over project lifetime (30 years)	$2,100	$17.86
Ecosystem Goods and Services values (US$/ha/yr) at risk	$1,583.76	$177.97
Total carbon sequestration loss estimates (t of CO2/ yr.)	303,107	22,795
Average price of carbon (US$/tCO2)	$17.00	$20.00

Exhibit B83-6, Attachment 4, p. 5

511. For the reasons set out below, it is clear that NG's evidence continues to underestimate the full extent of the proposed project on EGS. By underrepresenting the cost of these EGS, NG's evidence understates the burdens associated with the proposed project.

9.1.1.3 Economic Effects Affect the Project Effects Assessment Area (PEAA)

512. The most significant difference between these two analyses is the choice of project impact. The Project Development Area ("PDA"), which Anielski uses, is 10.9 times smaller than the PEAA, which Ruth and Gasper use. Anielski's decision to confine project effects to the PDA is not supported by the Application, which states that project effects are "likely" to occur within the PEAA. As confirmed by oral questioning, local impacts could occur in the PEAA.

Mr. Reid, Transcript Vol. 103, lines 28685-28691

513. By reducing the area for analysis from the PEAA to the PDA, Anielski misrepresents the extent of the cost associated with lost EGS.

514. The evidence submitted on behalf of the Haisla Nation assumed that environmental costs associated with the Northern Gateway Pipeline were experienced throughout the PEAA, which is described in NG's Application as the "much larger project effects assessment area (PEAA) where additional environmental effects are likely".

Exhibit B1-3, p. 9

515. This area is "1-km wide and includes the RoW. For some disciplines, the PEAA is even larger".

Exhibit B1-3, p. 9

516. The PEAA "encompasses the entire pipeline RoW, additional workspace, pump stations, and all ancillary facilities and powerlines for the Project".

Exhibit B3-3, p. 7

517. In contrast, Anielski's study assumed that project impacts occur only throughout the PDA, which is a 50 metre strip including the permanent right-of-way and temporary workspace.[113] The PDA is approximately 10.9 times smaller in area than the PEAA.

Exhibit B83-6, p. 5

518. The smaller size of the PDA results in a significantly smaller environmental cost estimate. Ascribing an economic value to only the lost EGS in the PDA, when NG has acknowledged effects will occur in the PEAA, undervalues these environmental costs. "[A]dditional environmental effects are likely" to occur in the PEAA.

Exhibit B1-3, p. 9

[113] As defined by B1-3, p. 9, Mr. Anielski, Transcript Vol. 75, lines 22563-22567.

519. Direct effects such as habitat alteration, as well as indirect Project effects such as deposition of air emissions, sensory disturbances (sound transmission) and wildlife avoidance can also be reasonably predicted or measured in the PEAA.

Exhibit B3-1, p. 61

520. There is no reason to assume that environmental impacts would be limited to the PDA. Under cross-examination, Mr. Anielski confirmed that environmental impacts could extend beyond the PDA and into the PEAA, emphasizing that it is the provincial government's responsibility to assess cumulative impacts.

> **22682. MS. BOYE:** I would like to take us back to what we were talking about previously, and this is with regards to what that -- what the boundary of the PDA means. And I just want to ask **whether you can recognize that it's not possible to know from Northern Gateway's Application the exact extent to which the project will have impacts beyond the PDA and into the PEAA**?
> **22683. MR. MARK ANIELSKI:** Let me say that it's -- **no, it's not possible**, and **the onus, I would say, is on provincial governments to have done their due diligence** on assessing the cumulative impact of linear disturbance at the watershed level. In the ideal world, we would have that evidence. I could tell you a 25-metre right-of-way isn't much bigger than old seismic lines in Alberta which were 15 metres (emphasis added).

Mr. Anielski, Transcript Vol. 75, lines 22682-22684

521. Thus, Mr. Anielski confirms that the boundary between the PEAA and the PDA is permeable and effects are not limited to the PDA.

522. In addition to focusing on the PDA, NG provided a project impact area of 8000 ha to its consultants. This excluded 276 ha of the PDA from their analyses. Apparently, NG had determined that "the impact on those areas ecologically would not be material".

Mr. Anielski, Transcript Vol. 73, lines 22600-22602

523. NG has not provided a justification for why the impact on these lands would not be material, nor specified where these lands are. Consequently, intervenors have been deprived of the opportunity to probe the veracity of NG's suggested study area. NG's consultants' estimate for the economic impact for lost EGS is underestimated because these lands have been excluded from their analyses.

524. In summary, the *Evaluation of Natural Capital Report*, which confines project effects to the PDA does not appear to be consistent with the Application, which states that Project effects are "likely" to occur within the PEAA. By reducing the area for analysis from the PEAA to the PDA, NG misrepresents the extent of the cost associated with lost EGS.

9.1.1.4 Cost Estimates for Lost Ecosystems Services

525. NG's analysis of key ecological functions is not credible because it excludes a number of key ecological functions and reflects a level of analysis that is based on incomplete or

incomprehensible data. By excluding a number of key ecological functions, NG underestimates the ecosystem costs associated with the proposed project.

526. On a per hectare basis, the Haisla Nation submitted evidence that estimated average EGS losses were US$1,583.76/ha/yr or 8.8 times larger than the losses submitted by NG's study's estimates of CDN $179.94/ha/yr (or US$177.96/ha/yr).

Exhibit B83-6, p. 6

527. The *Evaluation of Natural Capital Report* states that the majority of the difference between its estimates of EGS losses and the estimates provided in the *Ecological Costs Report* is due to the latter's use of significantly higher values attributed to water regulatory service (averaging US$1,484/ha/yr) impacts on forest land. This statement is unsubstantiated as the figures provided in the *Ecological Costs Report* are based on peer-reviewed academic literature.

Exhibit D80-75-3, p. 20

528. Mr. Anielski's analysis titled *Counting Canada's Natural Capital* and *Detailed Mackenzie Ecosystem Service Products Value Estimates*[114] recognized 17 key ecosystem services functions for forest ecosystems. These key ecosystem service functions include:

- atmospheric regulation,
- climate regulation,
- disturbance avoidance,
- water stabilization and regulation,
- water supply,
- erosion control and sediment retention,
- soil formation,
- nutrient cycling,
- waste treatment,
- pollination,
- biological control,
- habitat/refugia,
- water production,
- raw materials,
- genetic resources,
- recreation, and
- culture.

Mr. Anielski, Transcript Vol. 75, lines 22754-22768

529. By comparison, in NG's analysis, the following key ecosystem service functions were excluded:

- atmospheric regulation,
- disturbance avoidance,

[114] This report was not prepared for Northern Gateway.

- nutrient cycling.

530. Additionally, the following key ecosystem service functions were ascribed no value:

- water supply,
- erosion control and sediment retention,
- soil formation,
- waste treatment
- pollination,
- raw material, and
- genetic resources.

Mr. Anielski, Transcript Vol. 75, lines 22771-22774

531. Mr. Anielski recognized that these key ecosystem services provide important functions. Mr. Anielski conceded that by excluding these values his analysis underestimated ecosystem costs.

Mr. Anielski, Transcript Vol. 75, lines 22774- 22776

532. Mr. Anielski also confirmed that, to the extent that these ecosystems functions are lost, all of society bears these costs.

Mr. Anielski, Transcript Vol. 75, line 22784

533. In addition to excluding the key ecosystem service functions mentioned above, NG's analysis does not account for salmon habitat within the PDA.

Mr. Anielski, Transcript Vol. 75, line 22708

534. Salmon habitat was excluded from NG's analyses because its consultants' satellite imagery was "not of a fine enough resolution" to identify salmon habitat.

Mr. Ruitenbeek, Transcript Vol. 75, line 22711

535. Consequently, NG's consultants were incapable of distinguishing salmon habitat from other wetlands.

> **22717.** So I would imagine that -- I would perhaps suggest that specific salmon habitat was not separated in a different interpretation class from wetlands. So the salmon habitat may in fact be reflected within the wetlands. But I personally do not know in terms of the entire right-of-way interpretation into these particular land use classes.

Dr. Ruitenbeek, Transcript Vol. 75, lines 22716-22717

536. NG's inability to identify and distinguish salmon habitat is disturbing but not surprising given the lack of baseline studies done to support the ESA. It reflects a research methodology and data that are incomplete or incomprehensible. It also reflects an inaccurate and unreliable level of analysis.

537. NG's analysis of key ecological functions is not credible because it excludes a number of key ecological functions and reflects a level of analysis that is based on incomplete on incomprehensible data. By excluding a number of key ecological functions, NG underestimates the ecosystem costs associated with the proposed project.

9.1.1.5 Public Burdens Associated with Spill Costs

538. There are separate terrestrial and marine liability regimes associated with a spill. In general, in the terrestrial context, when the spill occurs from the pipeline, the marine terminal or a terminal pipeline, NG will be the responsible party. In a marine context, where the source of the spill is from the tanker, the tanker operator will be the responsible party.

Exhibit B40-6, p. 18

539. The following section is separated accordingly.

9.1.1.5.1 Burdens Associated with a Terrestrial Spill

540. As depicted in Ruth and Gasper's Table 16, below, the Haisla Nation submits that the ecological costs of NG's onshore oil spill scenarios range from US$12,000 to US$610 million.

Table 16 – Costs of Proposed Project Associated with Ecosystem Services.

Discount rate (%)	Total excluding oil spills, average ($billion)	Total excluding oil spills, low ($billion)	Total excluding oil spills, high ($billion)	Oil spills onshore ($thousand)	Oil spills offshore ($million)	Average total including all oil spills ($billion)
0	30.3	7.79	212	13-830,000	32-13,000	30-45
3	20.0	5.00	132	13-720,000	30-11,000	20-31
5	15.3	3.90	100	12-660,000	29-10,000	15-26
7	12.1	3.10	79	12-610,000	28-9,700	12-23

Exhibit D80-75-3, p. 41

541. Table 16 represents the ecological costs of an oil spill based on a range of magnitudes and location, as originally identified in the Application. The figures provided assess the suite of ecological costs that would likely result from a spill. These costs are conservative because they do not attribute a value to the costs associated with an oil spill on Haisla Nation aboriginal rights and title, cultural heritage, society and health. These costs are relevant to a public interest analysis because the cost of the lost ecological functions are borne by society as a whole.

542. In contrast, NG, estimates that the annual statistical loss (cost expectation) for a pipeline spill to be $3.41 million. NG estimates that two-thirds of the costs are associated with the oil line, noting that $2.07 million is associated entirely with leaks.

Exhibit B83-4, pp. 137 and 141

543. NG's estimate is comically (or perhaps tragically) low given that Enbridge has spent well in excess of $767 million trying to clean up its massive spill in Marshall, Michigan.

Exhibit D80-69-3, p. 27

544. One of the reasons NG's estimate is so low is because it is based on the annual statistical loss, and relies on the probabilities provided by the SQRA. The reliability of the SQRA to predict risk for the pipeline has not been established. This is addressed in greater detail in paras. 802 to 897 below.

9.1.1.5.2 Burdens Associated with a Marine Spill

9.1.1.5.2.1 NG's Failure to Consider the Potential Economic Impacts on Other Third Parties

545. NG's economic analysis of an oil spill does not take into consideration the costs of a spill on existing economic sectors within BC's marine economy. To address the deficiencies found in NG's quantitative risk assessment, Dr. Gunton and Dr. Broadbent assessed the potential economic impacts of a marine oil spill in coastal waters. According to their analysis, viable sources of the marine economy could be impacted from a west coast oil spill. Notably:

546. The present commercial fishing industry in BC represents $1.2 billion (2005 CAD) at wholesale value;

547. The current marine tourism sector in Coastal First Nations' traditional territories represents $104.3 million (2010 CAD); and

548. Recreational fishing in Coastal First Nations' traditional territories represents $90.5 million in economic activities and supports 1,960 direct, indirect and induced jobs.

Exhibit D35-14-4, p. 105

549. According to Mr. Gunton and Mr. Broadbent's analysis, an oil spill could have immediate negative effects on the short-term and long-term growth potential of these sectors. Further, while there is currently limited information on the potential economic impacts of an oil spill on other economic sectors in the marine economy, such as seafood processing, marine transportation, aquaculture, energy development, and other sectors, an oil spill could negatively impact all of these sectors.

Exhibit D35-14-4, p. 105

550. NG's economic analysis of an oil spill does not take into consideration the costs of a spill on existing economic sectors within BC's marine economy. Consequently, NG's analysis inflates the purported economic benefits and inaccurately deflates the economic costs of the proposed project. These burdens will be borne by the Canadian public, and should be incorporated as a burden within the Panel's public interest analysis.

9.1.1.5.2.2 Additional Burdens Borne by Canadian Taxpayers

551. The TERMPOL study recommended a number of additional aids to navigation be installed along the shipping route to Kitimat.

Exhibit E9-6-13, p. 57

552. These additional aids could cost approximately $11.9 million dollars in capital costs, plus $500,000 on an annual ongoing basis.

Exhibit E11-3-2, p. 23

553. To determine how these costs will be allocated, the Government of Canada (in this case the Coast Guard) must review the Coast Guard Levels of Service and Service Standards, which has not been completed to date.

Mr. Carrigan (CG), Transcript Vol. 171, lines 22852-22853

554. Therefore, the allocation of these capital and operating costs for these additional aids to navigation is currently unknown. It is foreseeable, however, that all, or a portion, of these costs will be borne by the Canadian public.

Mr. Carrigan (CG), Transcript Vol. 171, line 22853

555. Where navigation aids are installed by the Coast Guard, the Coast Guard is responsible for maintaining these aids; where the navigation aids are installed privately, the private operator is responsible for maintaining the aids.

Mr. Carrigan (CG), Transcript Vol. 171, line 22857

556. To the extent that these navigation aids are installed and maintained by the Coast Guard, they represent an additional cost, and burden, to the Canadian government and Canadian taxpayers.

557. To the extent that these navigation aids are installed and maintained by NG, they will increase capital and operating costs associated with the proposed project, which will either need to be offset through toll increases, or represent a cost to producers, or both, as discussed at paras. 385 to 397.

9.2 NG's Failure to Recognize the Unique Nature of Aboriginal Groups

558. NG has not recognized the unique nature of the Aboriginal groups which will be affected by the proposed project and the burdens the proposed project will place upon them.

559. Dr. Ruth and Ms. Gasper estimate that costs of lost ecological goods and services from the proposed. Dr. Ruth and Ms. Gasper estimate that costs of lost ecological goods and services from the proposed project within Haisla Nation Territory range from US$254 million to US$775 million. These figures depend on choice of discount rate, social cost of carbon and ecosystem service values

9.2.1 Burdens Specific to the Haisla Nation

560. Dr. Ruth and Ms. Gasper estimate that costs of lost ecological goods and services from the proposed project within Haisla Nation Territory range from US$254 million to US$775 million. These figures depend on choice of discount rate, social cost of carbon and ecosystem service values:

Table 23: Costs (US$ million) due to ecological and social impacts of construction within the Haisla territory over a 30-year project lifetime.

Discount rate ($)	Wetland services, average	Wetland Services, range	Forest services, average	Forest services, range	Tourism impacts	Salmon	Total
0	69	34-273	353	330-502	0.02	0.02	364-775
3	56	30-201	286	272-379	0.01	0.01	302-580
5	50	27-169	258	247-328	0.01	0.01	274-497
7	45	25-145	238	229-293	0.01	0.01	254-438

Exhibit D80-75-3, p. 45

561. Dr. Ruth and Ms. Gasper's costs are conservative because they did not purport to place a value on damage to the Haisla Nation's rights and title, health, and culture.

562. As discussed previously, the Haisla Nation is uniquely situated within the geographical scope of the proposed project. The Haisla Nation stands to be disproportionately affected by the construction and operation of the proposed pipelines, marine terminal and marine shipping, as well as from spills. As a result, the Haisla Nation will be exposed to, and likely incur the greatest environmental, commercial and subsistence costs and risks of the proposed project. In contrast, potential owners and shippers' costs would largely be limited to financial losses. Such an asymmetrical distribution of costs and benefits is real, inequitable and contrary to the public interest. NG has not addressed this asymmetrical distribution of impacts in its assessment of the public interest.[115]

Exhibit D35-22-2, p. 31

9.2.2 Non-Monetizable Costs are Integral to a Public Interest Analysis

563. Costs that cannot be monetized still need to be reconciled and addressed by the Panel. For the Haisla Nation, the interconnections between the environmental, social and subsistence

[115] Confirmed at: Hearing Transcript Vol. 75, lines 22677-22681.

practices are integral to its cultural heritage and social, spiritual and personal well-being. The importance of these interconnections is illustrated in the discussion of Haisla Nation aboriginal title and aboriginal rights and cultural heritage in Section II. When deliberating on the burdens this project presents, the Panel should recognize that the burdens it presents to the Haisla Nation's Territory ripple into every aspect of Haisla Nation's members' lives.

564. There is an innate connection between the Haisla Nation and its Territory and Haisla Nation member social and spiritual connections, cultural transmission, health, and traditional economy. A loss of Haisla Nation cultural heritage is not compensable.

565. The Haisla Nation has set out in detail how the ability of the Haisla Nation members to exercise their aboriginal rights, title, and interests in their Territory is essential to their physical, economic, cultural, and spiritual survival. Haisla Nation cultural heritage is of infinite and non-compensable value.

566. The fact that Haisla Nation cultural heritage cannot easily be quantified or monetized does not mean that they can be ignored or should be excluded from a public benefit analysis:

> **22825**. It's not unusual, for example, for people to attribute what they may regard as infinite value -- or what I think you regard it as ''priceless'' to something before -- **and in the event that something is indeed of infinite value then, quite frankly, the cost benefit and usual market assumptions that lead into cost benefit work -- which is what my evidence involves -- cannot capture infinite values for goods or services** (emphasis added).
>
> *Mr. Ruitenbeek, Transcript Vol. 75, line 22825*

567. NG's analysis makes no distinction between the impact of the pipeline on different groups within Canada:

> **22831.** I'm not trying -- again, I will -- I will restate that. In all elements of the cost benefit work, we have not distinguished among Aboriginals and non-Aboriginals. That's not to say that we have neglected or preferably taken into account some considerations, **it's that at the level of analysis that we're doing for the cost benefit work there is no distinction made among individuals or groups of individuals** (emphasis added).
>
> *Dr. Ruitenbeek, Transcript Vol. 75, line 22831*

568. NG's analysis is incapable of considering areas or resources that are "priceless" or of infinite value. Similarly, NG's analysis ascribes no weight to the impact this proposed project will have on groups like the Haisla Nation, such as through impacting Haisla Nation cultural heritage or constitutionally protected aboriginal rights and title. This approach is fundamentally at odds with NG's repeated assertions that it wishes to be respectful of aboriginal peoples.

569. Difficulties associated with ascribing a monetary value to the burdens the Haisla Nation will suffer as a result of the proposed project does not mean that NG has a free pass to disregard these enormous costs, nor does it mean that the Panel should exclude such costs from consideration.

9.3 Weighing the Proposed Project's Public Benefits and Public Burdens

570. The NEB criteria for project approval requires the proposed project to be needed and in the public interest.

571. In evaluating the public interest and overall public good of a project, the Panel must consider and weigh the negative aspects and impacts, and issue a recommendation:

> The public interest is inclusive of all Canadians and refers to a balance of economic, environmental, and social interests that change as society's values and preferences evolve over time. As a regulator, the Board must estimate the overall public good a project may create and its potential negative aspects, weigh its various impacts, and make a decision.[116]

572. As a component of its public interest analysis, the Panel weighs and analyzes the nature of the Aboriginal concerns and any negative impacts on these interests:

> The Board weighs the overall public good a project may create against its potential negative aspects, including any negative impacts on Aboriginal interests, and makes its decisions in accordance with the public interest. As part of the decision-making process, it takes into consideration the potential environmental and social impacts and the potential for mitigation of those impacts.[117]

573. The Panel has discretion to consider "any public interest" that it believes may be affected by the issuance of a certificate or the dismissal of an application.[118]

574. Presently, the Panel is faced with a unique set of circumstances, which includes the transportation of highly toxic and carcinogenic hydrocarbon products though seismically unstable, remote and highly fragile ecosystems, such as the Kitimat River Valley.

575. NG suggests that the proposed project is needed and in the public interest because it will provide needed pipeline capacity to accommodate increasing oil production in the Western Canadian Sedimentary Basin, will provide access to Asian markets which will reduce risk through market diversification, will result in higher returns for oil producers, and will generate significant economic activity.

576. NG's submission on need and the public interest is deficient and incomplete. Support for this position is based on the following:

- An independent BCA predicts that there is no scenario where the proposed project will generate net benefits to Canada. The net costs to Canada range from a cost of $362.4 million to over $2.2 billion (2009 CAD).
- Muse Stancil's Net Benefit analysis is not accurate or reliable and should be given no, or diminished, weight. This analysis is flawed because it assumes that the Oil Export Pipeline generates benefits even after the pipeline is operating at capacity;

[116] NEB Reasons for Decision, *Emera Brunswick Pipeline Co.,* GH-1-2006, May 2007, para. 41
[117] NEB Reasons for Decision, *Enbridge Southern Lights LP*, OH-3-2007, February 2008, p. 10
[118] NEB Reasons for Decision, *Nova Gas Transmission Ltd*., GH-001-2012, January 2013, p. 41

the oil prices relied on are not within a reasonable realm of accuracy; the assumption of a permanent Asia premium is unjustifiable; and key variables, such as the appreciating Canadian dollar and supply dynamics, are ignored.

- Wright Mansell's analysis suffers from the following methodological errors: the increase, on what appears to be an arbitrary basis, the figure Muse Stancil calculated as the netback benefit; the failure to consider how price increases on crude impose negative impacts on the Canadian economy; the inclusion of the reinvestment of revenues as a benefit without the consideration of the corollary negative economic impacts on netbacks; and the use of "total" benefits, as opposed to incremental employment impacts (impacts that would not occur but for the proposed project). As a result of these methodological flaws, Wright Mansell's predicted public benefit is unreliable and should receive little, or diminished, weight.
- Economic values should be placed on changes to EGS and the values, provided through independent assessments, are significantly greater than suggested by NG. If the loss of such values were properly considered, then the economic costs of the proposed project would be considerably higher and these burdens are not public interest.
- NG ascribes no weight to the impact this proposed project will have on groups like the Haisla Nation, such as through impacting Haisla Nation's members health, society, social welfare, cultural heritage, or constitutionally protected aboriginal rights and title. Difficulties associated with ascribing a monetary value to the burdens the Haisla Nation will experience as a result of the proposed project does not mean that NG has a free pass to disregard these enormous costs, nor does it mean that the Panel should exclude costs from consideration.
- For these reasons, the proposed project's burdens outweigh its benefits and the proposed project is not in the public interest. The Panel should recommend it not be approved.

577. **Finding Requested: The Panel should find that NG has not established that the proposed project is needed and in the public interest.**

IV. ENVIRONMENTAL EFFECTS ASSOCIATED WITH THE PIPELINES

578. The construction and routine operation of the proposed pipeline will result in significant impacts to Haisla Nation Territory. The analysis in NG's ESA addresses environmental effects and significance of those effects pursuant to an assessment under *CEAA 2012* and asserts that there will be no significant adverse effects that cannot be mitigated. The Haisla Nation submits that the evidence filed with the Panel flatly contradicts this assertion.

579. NG's assessment of the effects of construction and routine operations suffers from significant information gaps, and relies on false conservatism, prediction over-confidence, and unreliable information. NG's analysis lacks transparency in the assessment of significance and has not incorporated the aboriginal perspective.

580. Further, NG acknowledges that if an accident or malfunction occurs from the pipeline, it is likely to cause significant adverse environmental effects, but seeks to unrealistically downplay the extent and duration of these effects. NG takes the position that the likelihood of a spill is low, so the significant adverse effects are not likely to occur. The Haisla Nation submits that the evidence filed with the Panel contradicts this conclusion as well.

Exhibits B3-20, p. 68 and B3-21, p. 31
Exhibit B80-2, p. 3

581. Finally, the question of whether or not the effects of the proposed project result in significant impacts to Haisla Nation aboriginal title and rights requires a different assessment than that required under *CEAA 2012*. This portion of the argument will first address the environmental effects under a traditional *CEAA 2012* analysis, and then contextualize them in terms of impacts to the Haisla Nation.

1. Legal Context for the *CEAA 2012* Assessment

582. This section on legal context for the *CEAA 2012* assessment applies to the assessment of effects from the proposed pipelines, from the proposed Kitimat Terminal, and from marine shipping associated with the proposed project.

583. The proposed project requires an environmental assessment and cannot proceed unless it receives a decision statement that the proposed project is not likely to cause significant adverse environmental effects or that the significant adverse environmental effects that it is likely to cause are justified in the circumstances.

584. The role of the Panel, for the purpose of the environmental assessment, is to determine whether it can conclude that the proposed project is not likely to cause significant adverse environmental effects.

585. In order to make this determination, the Panel must be provided with sufficient information for it to understand the existing environmental setting, the potential effects of the proposed project, mitigation measures that are technologically and economically feasible to reduce or eliminate those effects, and the significance of residual effects.

1.1 Governing Legislation

586. The environmental assessment of the proposed project is governed by the *CEAA 2012,* which defines environment and environmental effects and sets out the factors that must be considered in the assessment of environmental effects.

587. Environment:

> "environment" means the components of the Earth, and includes:
>
> *(a)* land, water and air, including all layers of the atmosphere;
>
> *(b)* all organic and inorganic matter and living organisms; and
>
> *(c)* the interacting natural systems that include components referred to in paragraphs (*a*) and (*b*).

588. Environmental effects:

> 5. (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are
>
> *(a)* a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:
>
> i. fish as defined in section 2 of the *Fisheries Act* and fish habitat as defined in subsection 34(1) of that Act,
>
> ii. aquatic species as defined in subsection 2(1) of the *Species at Risk Act*,
>
> iii. migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*, and
>
> iv. any other component of the environment that is set out in Schedule 2;
>
> *(b)* a change that may be caused to the environment that would occur
>
> i. on federal lands,
>
> ii. in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, or
>
> iii. outside Canada; and
>
> *(c)* with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on
>
> i. health and socio-economic conditions,
>
> ii. physical and cultural heritage,
>
> iii. the current use of lands and resources for traditional purposes, or
>
> iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.
>
> (2) However, if the carrying out of the physical activity, the designated project or the project requires a federal authority to exercise a power or perform a duty or function conferred on it under any Act of Parliament other than this Act, the following environmental effects are also to be taken into account:
>
> *(d)* a change, other than those referred to in paragraphs (1)(*a*) and (*b*), that may be caused to the environment and that is directly linked or

necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of the physical activity, the designated project or the project; and

(e) an effect, other than those referred to in paragraph (1)(*c*), of any change referred to in paragraph (*a*) on

i. health and socio-economic conditions,

ii. physical and cultural heritage, or

iii. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

589. The *Fisheries Act*[119] defines fish and fish habitat:

"fish" includes

(a) parts of fish,

(b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and

(c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals;

"fish habitat" means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

590. The factors to be considered in conducting an environmental assessment are set out in s. 19 of *CEAA 2012*:

19. (1) The environmental assessment of a designated project must take into account the following factors:

(a) the environmental effects of the designated project, including the environmental effects of malfunctions or accidents that may occur in connection with the designated project and any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out;

(b) the significance of the effects referred to in paragraph (*a*);

(c) comments from the public — or, with respect to a designated project that requires that a certificate be issued in accordance with an order made under section 54 of the *National Energy Board Act*, any interested party — that are received in accordance with this Act;

(d) mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project;

(e) the requirements of the follow-up program in respect of the designated project;

(f) the purpose of the designated project;

[119] *Fisheries Act*, R.S.C., 1985, c. F-14, ss. 2 and 34(1).

> *(g)* alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alternative means;
> *(h)* any change to the designated project that may be caused by the environment;
> *(i)* the results of any relevant study conducted by a committee established under section 73 or 74; and
> *(j)* any other matter relevant to the environmental assessment that the responsible authority, or — if the environmental assessment is referred to a review panel — the Minister, requires to be taken into account.
>
> (2) The scope of the factors to be taken into account under paragraphs (1)(*a*), (*b*), (*d*), (*e*), (*g*), (*h*) and (*j*) is determined by
> *(a)* the responsible authority; or
> *(b)* the Minister, if the environmental assessment is referred to a review panel.
>
> (3) The environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge.

1.2 Information Requirements

591. NG is required to provide information to the Panel that allows the Panel to assess environmental effects. The National Energy Board's *Filing Manual*[120] provides direction to proponents on what information to provide. For the review of NG's proposed project, the Canadian Environmental Assessment Agency has also issued the *Scope of Factors – Northern Gateway Pipeline Project.*[121] The *Scope of Factors* is referred to in Part III of the Terms of Reference of the *JRP Agreement*. The *JRP Agreement* states at Part III:

> The Panel in conducting its consideration of the factors outlined in Part II will have regard to the following:
>
> - The National Energy Board's Filing Manual dated 2004 as amended from time to time; and
> - The document issued by the Canadian Environmental Assessment Agency, in response to comments received on the draft Joint Review Panel Agreement, entitled ''Scope of Factors – Northern Gateway Pipeline Project, August, 2009''.

592. In discussing the role of the *NEB Filing Manual* and the *Scope of Factors,* the *Scope of Factors* advises that the primary purpose of the *Scope of Factors* is to "provide additional guidance to the proponent on the assessment of environmental effects associated with the marine project components".

[120] National Energy Board' *Filing Manual* to guide applications (*NEB Filing Manual*).
[121] *Scope of Factors – Northern Gateway Pipeline Project* (Guidance for the assessment of the environmental effects of the Northern Gateway Pipeline Project as proposed by Northern Gateway Pipelines Limited Partnership, issued by the Canadian Environmental Assessment Agency, August 2009).

Exhibit D122-3-13, p. 4

593. The *Scope of Factors* also discusses the role of the *NEB Filing Manual*:

> **While it is ultimately the responsibility of the proponent to make its case before the Panel, the Filing Manual has been developed by the Board to provide direction regarding the information that would typically be expected to be addressed in a filing. The goal is to provide the proponent with a clear definition of the Board's expectations for complete filings.**
>
> *Exhibit D122-3-13, p. 4*

594. The *Scope of Factors* also explains that, "[a] the Filing Manual does not explicitly address the marine components associated with the Project, the Agency has prepared this scope of factors document."

595. The *Scope of Factors* is therefore to fulfill a similar role to the *NEB Filing Manual*. The *NEB Filing Manual* is relied on by the NEB to outline the Board's expectations about the information that the Proponent must include in an application under the *NEBA*. The NEB's support of the *NEB Filing Manual* requirements is a part of the multi-staged application process.[122]

596. Applications are assessed in accordance with filing requirements. The level of detail required to fulfill each requirement will vary given the nature and scale of the project, the predicted effects of the project and the level of public interest in the project.

> *Letter dated May 19, 2011 from NEB to Parties to the Filing Manual Update and NEB-Regulated Pipeline Companies, File Ad-Ga-GFR-FMAP 01, p. 4*

597. Further, fulfilling the filing requirements is not determinative of a successful application to the Board. The information set out in the *NEB Filing Manual* does not limit the NEB from requesting additional information it may find relevant. The Board will determine the information required to fully assess a project. The onus lies on the proponent to consider the *NEB Filing Manual* in its application and to provide justification for the methodology used and the level of detail required in its assessment.

> *Letter dated May 19, 2011 from NEB to Parties to the Filing Manual Update and NEB-Regulated Pipeline Companies, File Ad-Ga-GFR-FMAP 01, p. 7*

598. Previous cases before the NEB have relied on the requirements set out in the *NEB Filing Manual* in their reasons for decision.[123]

599. The *Scope of Factors* thus supplements the information requirements guidance for NG's application, and in the submission of the Haisla Nation sets fundamental threshold requirements with respect to information required for the Panel to reasonably assess the effects of the proposed project.

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[122] *TransCanada Pipelines Ltd. (Re*), 2007 LNCNEB 1.
[123] See *TransCanada Keystone Pipeline GP Ltd. (Re)*, 2007 LNCNEB 9 at para. 162; *Emera Brunswick Pipeline Co. (Re)*, 2007 LNCNEB 3 at para. 187; *NOVA Gas Transmission Ltd. (Re)*, 2012 LNCNEB 4 at paras. 97-104.

600. The *Scope of Factors* describes the baseline information that is required as needed to provide a complete description of the biophysical and socio-economic setting, including the current state of the environment within the study area, to compare against the project description to identify potential effects:

> … the proponent must provide a sufficient description of the local setting to allow the Panel, other regulators, the public, and others to clearly understand the rationale for environmental assessment decisions.
>
> *Exhibit D122-3-13, p. 10*

601. The *Scope of Factors* then states:

> With respect to all components of the Project (i.e. terrestrial and marine), without limiting itself to this list, **the proponent will** provide the baseline information outlined in the following Subsections 6.1 to 6.3, as appropriate. Where such information is not provided, the proponent **will provide a rationale** as to why it has not done so (emphasis added).
>
> *Exhibit D122-3-13, p. 10*

602. The Panel is required to issue a report that sets out its conclusions and recommendations relating to the environmental assessment of the proposed project:

> The report will also set out the Panel's rationale, conclusions and recommendations relating to the environmental assessment of the project, including any mitigation measures and follow-up programs and a summary of any comments received from the public and Aboriginal peoples, as well as information referred to in Section 8. The report will also identify:
>
> - those conclusions that relate to the environmental effects to be taken into account under section 5 of the *Canadian Environmental Assessment Act, 2012*; and
> - recommended mitigation measures that relate to the environmental effects to be taken into account under section 5 of the *Canadian Environmental Assessment Act, 2012*.
>
> *Amended Joint Review Panel Agreement (A2X0I0), p. 7*

603. Section 19 of *CEAA 2012*, the *Scope of Factors*, and the *NEB Filing Manual* must all be considered by the Panel in assessing the proposed project. The *Scope of Factors* has been specifically developed to supplement the *NEB Filing Manual* with respect to marine components of the proposed project, but also provides very specific direction to NG for the filing of baseline information. This is information the Minister has determined as required to assess the proposed project and which must be considered in conducting the environmental assessment.

604. As set out above, in order to perform its obligations under *CEAA 2012* and the *JRP Agreement*, the Panel must be provided with sufficient information for it to understand the existing environmental setting, the potential effects of the proposed project,

mitigation measures that are technologically and economically feasible to reduce or eliminate those effects, and the significance of residual effects.

605. Where NG has not provided the baseline information set out in the *Scope of Factors* the Panel will not be able to have a full understanding to the existing environmental setting to which to compare project effects. NG has failed to provide the baseline information outlined in the *Scope of Factors* in a number of places, discussed in more detail herein. The Haisla Nation submits that NG's failure to provide this information means the Panel is not reasonably able to make a determination that the proposed project is not likely to cause significant adverse environmental effects.

1.3 Mitigation and Assessment of Significance

606. The Panel must make a determination of the significance of adverse environmental effects. The significance is assessed on the basis of residual environmental effects, i.e. after proposed mitigation measures have been considered.[124]

607. Assessing the significance of environmental effects requires:

- determining whether there will be adverse effects on the environment;
- determining whether these adverse effects remain significant after mitigation; and
- determining whether the adverse effects are likely to occur.[125]

608. Assessing the likelihood of whether the adverse effect is likely to occur requires assessing the likelihood that mitigation measures that are proposed to avoid or minimize effects can succeed.

609. Mitigation is defined in *CEAA 2012*:

> "mitigation measures" means measures for the elimination, reduction or control of the adverse environmental effects of a designated project, and includes restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means.

610. Assessing whether a measure proposed as a mitigation measure will be able to eliminate, reduce or control an adverse environmental effect requires an understanding of the effects of a proposed project. Understanding the effects of a project requires understanding the current environmental setting. Therefore, in order to determine whether measures put forward as mitigation measures are likely to eliminate, reduce or control the adverse effects requires having information about the current environmental setting that supports reaching conclusions about how mitigation measures can be effective.

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[124] *A Reference Guide for the Canadian Environmental Assessment Act: Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects*, prepared by the Federal Environmental Assessment Review Office, November 1994 (*CEAA: A Reference Guide for Significance)*.
[125] *Bow Valley Naturalists Society* v. *Canada (Minister of Canadian Heritage)*, [2001] 2 FC 461 (FCA), para. 49.

1.3.1 Mitigation

611. In *Quebec (AG)* v. *Canada (National Energy Board)*,[126] the Supreme Court of Canada endorsed and adopted Reed J.'s statement in *Friends of the Island Inc.* v. *Canada (Minister of Public Works)*[127] setting out the level of information that is required at the assessment stage:

> … the assessment is required to take place at a stage when the environmental implications can be fully considered (s. 3) and when it can be determined whether there may be any potentially adverse environmental effects (s. 10(1)) (emphasis in original).

612. NG's proposed project has not achieved a state where the Panel can fully consider the environmental implications because it does not have enough baseline information about the fate and behaviour of the products to be transported by the proposed project or about spill response. As a result, if there is an accident or malfunction that will result in a spill, the Panel cannot determine whether the adverse effects or whether these effects can be mitigated.

613. The adaptive management approach that has developed in conjunction with the application of the precautionary principle in environmental assessments in Canada, and which has been referred to by NG, cannot remedy the uncertainty demonstrated by the evidence about the fate and behaviour of the products and spill response.

614. Adaptive management has been described as a guiding tenet for Canadian environmental assessments, developed to respond to the difficulty of predicting all environmental consequences of a project on the basis of existing knowledge and to provide a means to overcome the potentially paralyzing effects of the precautionary principle.[128] It allows projects with uncertain yet potentially adverse environmental impacts to proceed, provided sufficient information about potentially adverse effects and potential mitigation already exists.[129]

615. Here, the Panel does not have sufficient information about potential mitigation. The role of mitigation and monitoring in an environmental assessment is to confirm and ensure

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[126] *Quebec (AG) v. Canada (NEB)*, [1994] 1 S.C.R. 159: "This case appears to me to be just such a situation where the nature of the proposal means that the flexibility of the process set out in the *EARP Guidelines Order* is helpful. In this regard, I adopt the words of Reed J. of the Trial Division of the Federal Court in *Friends of the Island Inc. v. Canada (Minister of Public Works)*, [1993] 2 F.C. 229, where she stated (at p. 264):

> It is not disputed that it is preferable to identify potential environmental concerns relating to a project before private sector developers (or public sector developers for that matter) proceed to a final design. It is also desirable to use the process as a planning tool and to avoid duplication. I am not convinced however that it is useful to consider whether the Guidelines Order requires the assessment of [a] proposal at the concept stage or at a more specific design stage. What is required may very well depend on the type of project being reviewed. What does seem clear is that the assessment is required to take place at a stage when the environmental implications can be fully considered (s. 3) and when it can be determined whether there may be any potentially adverse environmental effects (s. 10(1)). [Emphasis in original.]"

[127] *Friends of the Island Inc. v. Canada (Minister of Public Works),* [1993] 2 F.C. 229.

[128] *Pembina Institute for Appropriate Development v. Canada (Attorney General),* 2008 FC 302 [*Pembina*], paras.29-32.

[129] *Pembina*, *supra*, para. 34.

that a project will not result in significance adverse effects. Thus, the Panel must be able to conclude on the basis of the information before it that the potential environmental effects from the proposed project will not be significant. This conclusion must be founded in and linked to a science and fact based assessment of potential adverse effects.[130]

616. In *Alberta Wilderness Assn. v. Express Pipeline Ltd.*[131] the Federal Court of Appeal was charged with examining when mitigating factors should be considered with respect to the significance of environmental effects. The court held that *CEAA* implicitly "strongly suggests" that mitigation and environmental effects ought to be examined together. In *Canadian Transit Co. v. Canada (Minister of Transport),*[132] the Court was asked to overturn the environmental assessment decision on the basis that mitigation was not reasonably defined. The Court held on the facts before it that only the mitigation measures presented in evidence were used in the evaluation of the risk of significant adverse environmental effects and, conversely, that the project had not been approved on the basis of mitigation measures that had yet to be developed.

617. In evaluating the mitigation that is being proposed, the Panel must rely only on mitigation presented in the evidence. If the Panel concludes that proposed mitigation cannot reduce the potential adverse effects to an insignificant level, the Panel must say so.

618. The Federal Court of Canada has outlined the threshold for what may be considered a "significant adverse environmental effect" as:

> [T]o be insignificant, an adverse effect cannot be moderate, but rather must be without significance. To describe an adverse effect, or impact, as "moderate" is to mean that it is of significance, although not so seriously adverse as some others may be. By definition, that which is of moderate effect cannot be of insignificant effect. It cannot be "minime" if it be of moderate importance. So, the Court must take it to be the authors' meaning that moderate impacts are significant adverse environmental effects.[133]

619. As such, any effect outside of the *de minimus* range must be considered a significant environmental effect and thus must be addressed by proposed mitigation. If the effect is not addressed in the proposed project's mitigation, the Panel cannot approve the proposed project.

620. The potential fate and behaviour of the products to be shipped on the proposed project remains an area of uncertainty and debate. The federal government participants, who describe themselves as providing "specialized scientific advice" to the Panel have highlighted the extent of this uncertainty, as set out in detail at paras. 1249 to 1297, below.

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[130] *Pembina*, *supra*, paras. 72-74.
[131] *Alberta Wilderness Assn. v. Express Pipeline Ltd.* (1996), 137 D.L.R. (4th) 177 (F.C.A.), para. 13.
[132] *Canadian Transit Co. v. Canada (Minister of Transport)*, 2011 FC 515, para. 213.
[133] *Canadian Wildlife Federation Inc. v. Canada (Minister of the Environment)* (1989), 34 F.T.R. 1, p. 12 [*Canadian Wildlife Federation*].

621. In its assessment under *CEAA 2012*, the Panel can consider as mitigation "measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project."[134]

622. The proposed mitigation must be technically and economically feasible, and must also be reasonably certain. In *Pembina*, the Supreme Court of Canada endorsed the finding in *Canadian Wildlife Federation Inc. v. Canada (Minister of the Environment)*[135] that mitigation cannot consist of "vague hopes for future technology". In that case adverse water quality effects were found not to be mitigable because the possibility of future research and development does not constitute mitigation measures.[136]

623. Given the specific information inadequacies in NG's application about spill response as mitigation, based in uncertainty about the fate, behaviour, and toxicity of diluted bitumen, the known inadequacies of equipment for containing submerged oils and the cursory attention paid by NG to spill response planning to date, as will be set established through this submission, the Panel should give no or little weight to spill response as mitigation for the effects of a spill from the proposed project. This conclusion applies to spill response in both the terrestrial and marine environment.

1.3.2 Significance

624. Further, assessing significance of adverse environmental effects also requires having a level of information about the current environmental setting that supports reaching conclusions about how mitigation measures can be effective.

625. The assessment of significance requires an assessment of the likelihood of an effect occurring. This cannot be divorced from the likely success of proposed mitigation measures. The more tenuous the success of a proposed mitigation measure, the more likely that an adverse effect will occur. The likelihood of occurrence may raise the effect above the effect level professed to be achieved by the proponent after mitigation. Put simply, if a measure put forward as mitigation is unlikely to succeed in eliminating, reducing, or controlling an effect, the likelihood of the effect is higher. For this reason, the likely significance of adverse environmental effects also requires an understanding of the current environmental setting.

626. Finally, although assessing significance of adverse effects requires an assessment of the likelihood of an effect occurring, this assessment cannot, the Haisla Nation submits, be divorced from the degree and extent of the adverse effect. Even if a project has only a low likelihood of causing adverse environmental effects, assessing significance requires an assessment of the magnitude of the adverse effects.

627. The concept of catastrophic risk, or black swan events, is instructive. It requires consideration not only of probability of an event occurring, but extent of the harm that flows from the event.

Exhibit D72-27-2 (generally)

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[134] *Canadian Environmental Assessment Act*, S.C. 2012, c. 19, s. 52 at s. 19(1)(d).
[135] *Canadian Wildlife Federation*, *supra*, p. 12.
[136] *Pembina*, *supra*, para. 25.

628. Thus, the possibility of events like Enbridge's pipeline rupture at Kalamazoo, EVOS and Deepwater Horizon must all be taken into consideration when assessing significance of effects. A low likelihood of a large spill is not a reasonable foundation for a conclusion that the proposed project is not likely to cause significant adverse environmental effects. The wrong spill in the wrong place at the wrong time will have severe long-lasting adverse effects on Haisla Nation Territory, on Haisla Nation members, and on Haisla Nation cultural heritage.

2. Impacts of Pipeline Construction and Operations in Haisla Nation Territory

629. The proposed pipelines will enter Haisla Nation Territory through the Hoult Tunnel at the upper end of the Kitimat River Valley, at approximately Kilometer Point (KP) 1092 and remain in Haisla Nation Territory all the way to the terminal, at approximately KP 1177.62 (of Route Revision V).

630. The impacts that construction and operation of the pipeline will have are identified in NG's application. For convenience these impacts are summarized at a high level below:

- Construction of the Hoult and Clore tunnels will require blasting, drilling, and stockpiling of material, which will cause noise disturbance to wildlife, loss of vegetation and potential acid rock drainage with water quality implications for the Kitimat River and Estuary.

  Exhibit B3-4, p. 19

- Construction of the pipeline will require clearing, blasting, digging and grading, which will result in loss of vegetation and wildlife habitat, habitat loss and potential increased mortality, disturbance, emissions, and potential acid rock drainage (ARD) with water quality implications for the Kitimat River and Estuary. In Haisla Nation Territory the pipeline ROW will cut a 50 m swath for approximately 85 km (from KP 1092 to 1177), with an additional 10% for extra work space, resulting in the taking up a total of 467.5 ha of Haisla Nation aboriginal title lands. A 25 m wide portion of the ROW will be required permanently.

  Exhibit B3-4, p. 5

- The pipeline will cross 219 watercourses in the Kitimat River drainage, with the potential to damage, destroy or alter fish habitat. NG has estimated 31,070 m^2 of harmful alteration destruction and disruption of fish habitat (HADD) for watercourse crossings in Haisla Nation Territory.

  Exhibit B11-1, p. 133
  Exhibit B47-1, Attachment JRP IR 8.19

- The proposed project will require additional rights of way for access roads and transmission lines, the extent of which is not yet known and the impacts of which have not been assessed.

631. If the pipelines proceed, it is certain that the impacts identified from the construction and operation of the pipelines will occur.

Mr. Green, Transcript Vol. 102, line 27133

632. Many of the impacts in the NG application are set out in terms of physiographic regions. While the Coast Mountain Physiographic Region does not overlap Haisla Nation Territory exactly, it is the closest proxy for that portion of the pipeline which is in Haisla Nation Territory. The Coast Mountain Physiographic Region comprises 8% of the Project Effects Assessment Area (PEAA) for the proposed project.

Exhibit B3-4, p. 60

633. The summaries of the environmental effects that are anticipated to occur, however, make it clear that the impacts to Haisla Nation Territory identified above will occur, and will generally occur disproportionately highly in the Coast Mountain Physiographic Region: [137]

- Approximately 28% (23 of 83) of the geohazard sites (geothechnical, hydrotechnical and seismic hazard sites) are located in the Coast Mountain Physiographic Region.

  Exhibit B3-4, p. 13

- Approximately 27% (16 of 59) of the mass wasting (rock fall, avalanche, debris flow, or slump) sites are located in the Coast Mountain Physiographic Region.

  Exhibit B3-4, p. 22, Table 7-3

- With respect to surface disturbance of vegetation, 18% of ecosystem units disturbance (1,194 of 6,631 ha), 34% of old growth forests disturbance (181 of 527 ha), 66% of rare ecological communities disturbance (261 of 396 ha), 5% of wetlands disturbance (26 of 462 ha), and 20% of timber resources disturbance (304,982 of 1,497,999m^3) is anticipated to occur in the Coast Mountain Physiographic Region.

  Exhibit B3-5, p. 41-42, Table 8-52

- Approximately 15% (239 of 1,564) of the watercourse crossings are in the Kitimat and Douglas Channel drainage (the approximate equivalent of Coast Mountain Physiographic Region). As discussed below, these watercourse crossings pose a threat to a much broader area of Haisla Nation Territory in the event of a pipeline leak or rupture.

  Exhibit B3-9, p. 3

- Approximately 18% (31,070 of 167,340 m^2) of freshwater HADDs are anticipated to occur in the Kitimat and Douglas Channel drainage. Further analysis shows 22% of the estimated HADDs for high risk watercourse crossings and 35% for the medium high-risk watercourse crossings are anticipated to occur in the Kitimat River and Douglas Channel drainages.

  Exhibit B47-1, Attachment JRP IR 8.19

[137] Out of necessity, this analysis is restricted to those environmental effects for which values have been provided.

634. In summary, Haisla Nation Territory will be disproportionately heavily impacted, compared to overall impacts from the proposed pipelines. As a result, the Haisla Nation will disproportionately bear the environmental and ecological burden of the proposed pipelines. In addition, the marine terminal and major aspects of marine shipping will also occur in Haisla Nation Territory, as discussed in more detail in Sections V and VI below.

2.1 Information Gaps

635. NG's proposed project cannot be properly assessed on the basis of the information that has been provided in NG's application and its subsequent filings. There are significant information gaps that undermine the reliability, completeness and credibility of the assessment of the effects of the proposed pipelines.

2.1.1 Too Much Information Deferred to Detailed Engineering or Post-Certificate

636. The testing of NG's application and evidence through the Information Request process and through oral questioning shows that significant aspects of the proposed project have not been planned in enough detail to allow a reasonable assessment of effects and impacts. In fact, NG has to date done less than 30% of the work required for the design of the proposed project. Basically NG is saying "trust us" – a request entirely unwarranted based on the Enbridge's track record of spills, leaks and ruptures.

Transcript Vol. 91, lines 12308 to 12314

637. A number of critical aspects of project design have been deferred to detailed engineering and the results of such work will not be available to inform the JRP review of the project. These include, but are not limited to:

- Connection facilities – how shippers access pipelines.

  Exhibit B1-5, p. 12

- Subsurface conditions and feasibility of crossing methods (such as HDD and trenchless crossings) at various waterway crossings. Buoyancy control for some underwater crossings.

  Exhibit B1-5, pp. 20, 22, 23 and 47

- Finalized detailed pipeline route. The most recent revision filed in December of 2012 is Route V, the 22nd iteration. This does not represent a final pipeline route.

  Exhibit B1-5, pp. 27 and 29

- Geotechnical considerations and associated mitigation measures including marine clays, slope instability, ARD potential, landslide and avalanche potential, sedimentation, trench stability. These are all major issues within Haisla Nation Territory.

  Exhibit B1-5, pp. 34 and 35

- Clore and Hoult Tunnels – geotechnical considerations, potential excess cut disposal areas, acid rock drainage investigations.

Exhibit B1-5, pp. 35 and 56

- Kitimat Terminal – geotechnical considerations and associated mitigation measures. Configuration, potential final number and impoundment systems for tanks.

  Exhibit B1-5, pp. 35-36 and 80

- Operational hydraulic conditions of the pipelines.

  Exhibit B1-5, p. 37

- The lengths of heavy-wall sections and type of steel will be determined based on engineering assessments.

  Exhibit B1-5, p. 42

- Number and location of valves, fittings and associated remote communication systems.

  Exhibit B1-5, pp. 43 and 44

- Pump station design, selection of pumps and motors.

  Exhibit B1-5, p. 60

- Remote communication infrastructure.

  Exhibit B1-5, p. 63

638. Despite the lack of detail around potential impacts and effects as a result of the preliminary level of engineering that has been done to date, NG claims that adverse effects can be mitigated. This is a disturbing trend which characterizes NG's application at every level. The consequences of this approach are critical both for potential impacts from construction and routine operations and for potential impacts from accidents and malfunctions. As will be discussed in more detail below, NG is blithely promising that the impacts of an accident or malfunction that results in a spill can be mitigated through spill response, clean up and restoration, without having a clear understanding of the fate and effects of the products it will be shipping, or of the fish and other aquatic biota present in potentially affected rivers or marine ecosystems, and without providing a realistic plan to contain or clean up a spill.

639. In the context of construction and routine operations, critical aspects of project impacts are unknowable until additional work is undertaken, work which NG does not propose to complete in time to inform the JRP review of the proposed project, but rather seeks to delay until NG advances to the detailed design phase, long after the Panel will have the opportunity to assess the information flowing from this work.

640. NG defends this approach by claiming that the information that has been submitted is adequate for this stage of the project, for the assessment stage. The Haisla Nation disagrees.

2.1.2 Geotechnical Hazards and Terrain Stability Assessment is Incomplete

> A detailed assessment of geohazards prior to construction can identify specific areas that require special construction and mitigation techniques, and help engineers and planners anticipate situations where construction activities could accelerate natural processes.
>
> *Exhibit B3-4, p. 3*

641. NG has not provided a detailed assessment of geohazards. The information provided by NG about and the assessment of geohazards and terrain stability issues in the Kitimat River Valley is incomplete. As a result, it is impossible to have a reasonable understanding about the way in which NG's proposed project could accelerate natural processes that cause terrain stability issues. Terrain stability issues can, in turn lead to consequential environmental effects, including pipeline spills.

642. The geohazards in the Kitimat River Valley are considerable. In the geohazards study that supported the original SQRA, NG identified over 140 geohazards in Coast Mountains (up from 23 identified in the application). Approximately 28% of the geohazards sites and 27% of the mass wasting sites are located in the Coast Mountain Physiographic Region.

> *Exhibit B69-7, pp. 29-33*
> *Exhibit B3-4, p. 13*
> *Exhibit B3-4, p. 22, Table 7-3*

643. Further, the testing of NG's evidence has identified a number of significant areas of uncertainty about potential geohazards and terrain stability issues in the Kitimat River Valley:

- NG has not yet conducted a detailed geotechnical hazard assessment.

> *Transcript Vol. 85, lines 5234-5236*
> *Transcript Vol. 86, line 6306*
> *Transcript Vol. 87, line 7838*

- NG has not done enough investigation of marine clays to know where they are and what level of hazard they present in the Kitimat River Valley:

> **5342.** … We are specifically -- and I've said it before -- we are specifically going after a lot more information in the lower Kitimat valley in terms of drilling, investigations, testing and stability analyses relative to the glacial-marine clay.
> **5343**. We do not think that we have enough information at this point. The purpose of the clay report was to summarize everything that we knew at this point and it's common to the geotechnical investigations at this point in a project's life that we do not yet have every single answer. We are continuing our work into the detailed design.
>
> *Mr. Cavers, Transcript Vol. 85, lines 5332-5367*

- While NG has conceded that it has not done enough work on this critical issue, NG has deliberately deferred this work to some undefined future point after the Panel has issued its recommendation. NG's most recent geohazard mapping does not show sensitive marine clays that are adjacent to the pipeline. Marine clays are prone to liquefaction lateral spreading and cyclic failure.

  Dr. Rathje, Transcript Vol. 109, lines 5444 to 5452
  Exhibit B80-27-16, p. 3

- NG has not yet acquired detailed LiDAR, which may identify additional geotechnical hazards. This will not be acquired in time to inform the JRP assessment, but will take place during detailed engineering.

  5437. We do recognize that, as we get more LiDAR, more detailed LiDAR, as we look further at it -- as we get additional sources of information, that we may well identify additional geotechnical hazards. We expect to.

  Mr. Cavers, Transcript Vol. 85, lines 5437-5441

- LiDAR can identify landslides that conventional air photographs and ortho images will not.

  Mr. Cavers, Transcript Vol. 89, lines 9947-9957

- NG will be updating its seismic ground motion parameter work with the use of additional sites, but this update will not be available to inform the JRP assessment.

  Transcript Vol. 88, lines 8307-8328

- NG has not yet done the work to identify permafrost or alpine permafrost issues.

  Mr. Cavers, Transcript Vol. 85, lines 5732-5739

644. Natural Resources Canada has identified gaps in NG's application. In written evidence, Natural Resources Canada stated that NG did not adequately describe how project elements and activities may have effects on geology, terrain conditions and geohazards. As of November 28, 2012, NG had not provided any information to Natural Resources Canada or to the Panel which would address this gap. None of the material filed by NG since that date supplements its information in this regard.

  Exhibit E9-6-30, p. 20
  Mr. Clarke (NRCan), Transcript Vol. 110, lines 7455-7466

645. Finally, NG's application is inconsistent in the way it presents the residual environmental effects on terrain integrity. NG admits that it does not have a high level of confidence in predictions of environmental effects predictions on terrain, and that it will not be possible to achieve this until after site-specific studies to develop detailed mitigation strategies.

  Exhibit B3-4, p. 44

646. NG also states, that "[w]ith planned mitigation, the residual environmental effects of the Project on terrain integrity caused by effects on mass wasting, consolidation settlement and ARD are rated as not significant."

Exhibit B3-4, p. 45

647. Then, despite needing to do additional work to develop mitigation, NG's summary table 7-8 of the residual environmental effects on terrain integrity identifies the prediction confidence as high.

Exhibit B3-4, pp. 46-47

648. NG cannot have achieved this high prediction confidence, because, as it has repeatedly conceded, it has not conducted site-specific studies to develop mitigation strategies. NG is claiming a high prediction confidence based on work it anticipates doing at some future date. This is irrational.

649. In summary, there is a substantial information gap for geohazards in the Kitimat River Valley. The missing information is required to determine what the potential effects will be from the construction of the proposed pipelines and whether these can be mitigated. Instead of showing that mitigation will be possible by identifying all the concerns and the available technical approaches to mitigate concerns, NG has identified some of the concerns and advised that it ought to be able to mitigate additional ones that are encountered, and that once it has figured out how to do so it will have high confidence in its assessment of impacts on terrain stability. On the basis of the anticipated **future work**, NG has made a determination that effects are not significant.

650. The Panel should have no confidence in the NG's assessment of the impacts of the project on terrain stability in the Kitimat River Valley. NG has simply not done enough work to access the impacts of the proposed project on terrain stability in the Kitimat River Valley or, vice versa, to assess the effects of terrain stability on the proposed project.

651. NG's original SQRA for the pipeline ROW, filed in May of 2012, identified the Kitimat River Valley as the highest risk area for pipeline failure. NG's revised SQRA, filed in February of 2013, shows a lower risk for the project, but cannot be compared to original SQRA to determine whether route revisions, geohazard avoidance or additional design features to address geohazards have reduced the risk. NG has used a different approach to failure frequency which makes such a comparison impossible.

Exhibit B69-2
Exhibit B196-2
Mr. Mihell, Transcript Vol. 147, lines 20209-20222

652. The fact that NG filed a revised SQRA that prevents comparison with the original SQRA underlines the dearth of reliable geohazard information in the Kitimat River Valley and reinforces the Haisla Nation's concerns.

> **22280. MR. HUDSON:** How confident is Northern Gateway that all geohazards will be identified and avoided or mitigated so they don't pose an appreciable risk to the pipeline?

> **22281. MR. DRUMMOND CAVERS:** We think we have a very good starting point here. That starting point will be refined in the next -- in the next few years as we go into detailed design, get more LiDAR, get more investigations.
>
> *Mr. Cavers, Transcript Vol. 148, lines 22280-22281*

653. NG does not understand all the geohazard issues and how they may affect the proposed project during construction and operations or how they might contribute to the likelihood of a spill. As a result, NG has not provided sufficient and appropriate information to allow the Panel to make a reasonable assessment of the impacts of the proposed project on terrain stability and vice versa.

2.1.3 Aggregate Seismic Assessment Missing

> The hazard analysis performed by Atkinson[138] is site-specific; it only provides the MRPs of exceeding ground motions at specific sites. The 1,172 km long Northern Gateway Pipelines can be subjected to earthquakes anywhere along their length. Site-specific hazard analysis does not provide the MRPs of exceeding ground accelerations anywhere along the 1,172 km long pipelines.
>
> *Exhibit D80-27-14, p. 8*

654. NG has failed to assess aggregate seismic risk. NG has taken a code-based approach to seismic design. Code-based seismic design, however, does not guarantee that the risk will be reduced to an acceptable level because the acceptable risk varies from project to project depending on the consequence of a failure.

> **5666.** … when you have a large project with, you know, very high consequences of a failure, then it is expected that you should go beyond the code and assess the risk, quantify the risk.
>
> *Dr. Malhotra, Transcript Vol. 109, line 5666*

655. Therefore, meeting the code-based design standards is not sufficient; the seismic risk to the environment should be explicitly computed and compared with the acceptable level. NG has never revealed the acceptable risk level, nor has the aggregate seismic risk been computed.

> *Exhibit D80-27-14, p. 8*
> *Mr. Mihell, Transcript Vol. 87, lines 7872-7879*

656. Seismic design standards are based on a location by location analysis of the ground motion hazard. The risk to a geographically distributed structure such as a pipeline comes from hazards anywhere along its length and, as such, the chance of significant ground shaking anywhere along the 1,177 km pipeline is much greater than the chance of significant shaking at one particular location along the pipeline.

> *Exhibit D80-27-14, p. 8*

[138] Atkinson, G. M. (2009). *Preliminary Seismic Evaluation of Enbridge Northern Gateway Pipelines Project*. Final Revision: April 6, 2009.

657. The seismic design accelerations in codes and standards have a certain low probability of exceedance at specific locations only. For a geographically distributed structure such as the proposed pipelines, the design accelerations should have a certain low probability of exceedance anywhere along the 1,177 km pipelines. NG should have provided a detailed description of the hazard analysis for the pipelines; a site-specific hazard analysis is not suitable for the design of a geographically distributed structure like the proposed pipelines.

Exhibit D80-27-14, p. 8

658. Once the detailed hazard analysis was provided, NG should also have examined the additive risk for the proposed project along with other projects, for a proper cumulative effects assessment.

2.1.4 Routing Not Sufficiently Defined

659. NG has not narrowed its route sufficiently to know whether the PEAA accurately reflects the potential effects area. For example, NG has testified that if may move the portal of the Clore Tunnel by up to 500 m.

Mr. MacKay, Transcript Vol. 90, line 11981

660. Presuming the PEAA is centered on the center-line that was anticipated at the time of filing, then moving the Clore Tunnel portal would put the portal right on the edge of the PEAA. As a result of such relocation, a significant area where potential effects could occur would not have been assessed. This would apply equally in other areas where the anticipated center-line has shifted significantly.

661. The current emanation of the proposed route is Route Revision V. V is the 22nd letter in the alphabet, indicating the route has already changed to a degree requiring a new route identifier 22 times. Since NG has not yet sufficiently narrowed its routing, center-line surveys and the site-specific assessment that flows from center-line surveys have not yet been undertaken. As a result, NG, the Panel, and the Haisla Nation cannot fully identify site-specific concerns associated with the proposed pipeline ROW.

Mr. Anderson, Transcript Vol. 101, lines 26282-26288

2.1.5 Inadequate Information about the Biophysical Environment

662. NG has failed to conduct necessary studies for a number of components of the biophysical environment. As a result, it is not possible to fully understand the degree and extent of the effects the project may have on the biophysical environment.

663. NG explained that it has conducted baseline data gathering on potential impacts of construction and routine operations, not of spill events. Yet, NG also stated that purpose of the pipeline environmental effects monitoring program is two-fold: to look at some of the routine activity effects as well as to have a database in the event of an oil spill.

Mr. Anderson, Transcript, Vol. 104, line 29990
Mr. Green, Transcript Vol. 104, lines 30121-30122

664. NG has not assessed baseline vegetation in the Kitimat River Estuary, an area vulnerable to a spill from the proposed pipeline, the terminal or a tanker. NG concedes that it has not collected or provided detailed information about the Kitimat River Estuary, including vegetation surveys, and has no intention to do so until well after the JRP process is complete.

Exhibit B3-20, p. 54
Mr. Green, Transcript Vol. 100, lines 24079 and 24197

665. NG must do additional survey work to identify important wildlife features and habitats along the center-line.

Ms. Bryden, Transcript Vol. 104, line 29854

666. NG has not yet determined relevant construction timing constraints and assessed how these will be managed. NG has made commitments to construction timing constraints as mitigation for impacts to wildlife and fish, yet has not provided enough detail to allow a determination of whether there are any "safe" time periods for construction or whether these time periods are long enough to allow construction to occur.

Mr. Anderson, Transcript Vol. 103, lines 27886 and 27898

667. NG has not undertaken wetland functional assessments following the federal government's wetland function framework. This assessment would detail where wetlands would be affected, how their function will be measured, how compensation would be met and associated monitoring needs. Despite this, NG has concluded that adverse effects to wetlands will not be significant. Again, NG is asking the Panel to accept its conclusions about adverse effects without having done the work necessary to justify this request.

Mr. Anderson, Transcript Vol. 104, lines 29813-29829
Exhibit B83-2, p. 26
Exhibit B3-5, pp. 44-56, Tables 8-53 to 8-60

668. NG has not done habitat use surveys through multiple times of the year for watercourse crossings for the proposed project in the Kitimat River Valley. Fisheries and Oceans Canada has agreed that it is important to have information on habitat – where it is and what value it has, to assess whether cleanup activity itself could have negative impacts on fish habitat.

Mr. Anderson, Transcript Vol. 104, lines 29426-29427
Mr. Engelsjord (DFO), Transcript Vol. 107, lines 3521-3528

669. Water and sediment quality assessment is based largely on historic data and not field sampling. NG still has to collect background water quality and sediment quality and other information at certain proposed watercourses crossings. This work will not be done in time to inform the JRP process.

Mr. Anderson, Transcript Vol. 104, lines 22916-22917

670. NG must conduct detailed mapping and sampling to obtain a better indication of potentially acid generating rocks along the route. Environment Canada has identified acid

rock drainage and metal leaching potential as key water quality issues. This work will not be done in time to inform the JRP process.

Exhibit B3-4, p. 39
Exhibit E-9-6-32, p. 107
Exhibit B47-28, pp. 25 and 28

671. NG has identified the potential for significant adverse effects from the proposed pipeline to the biophysical environment and has stated that these can be reduced through mitigation to a point where they are no longer significant. The information gaps about terrain stability, routing, and the biophysical environment outlined above raise a serious doubt about whether NG has provided the Panel with enough information for it to reasonably assess the degree and extent of effects, their significance and NG's ability to mitigate these effects.

672. **Finding Requested: The Panel should determine that it cannot reasonably assess the significance of adverse effects from the proposed project on the basis of the information provided by NG.**

2.2 Northern Gateway's Assessment is Misleading

673. Although the impacts identified from the construction and routine operation of the pipeline are certain to occur, the degree and extent of the effects that will result from these impacts is less certain. NG's application has been submitted at the early stages of project design considerations, with many aspects to be further refined at the detailed engineering stage. As a result, the degree and extent of effects is in some instances unknown or unknowable, and so NG has relied on its own assumptions and estimates.

674. NG has not provided enough information to allow a determination of whether or not the assumptions and estimates relied on are valid. NG has characterized its assessment as conservative, but oral questioning has identified some of NG's claims of conservatism as unfounded and its confidence in its predictions is falsely portrayed.

2.2.1 False Conservatism

675. NG has characterized its assumptions and estimates as conservative and as therefore over-estimating the potential environmental effects associated with the proposed project.

Exhibit B3-1, p. 21

676. Oral questioning, however, has revealed studies or aspects of studies which NG advances as "conservative" to in fact be anything but conservative. In the assessment of effects on terrain integrity, for example, NG claims that the finding that terrain integrity may be affected in 14.8% of the PDA is conservative, but provides no support for the premise that this is a conservative estimate.

Exhibit B3-4, p. 13

677. Similarly, with respect to effects of air emissions on vegetation health, NG states that certain elements of the air quality dispersion and deposition modelling assessment methods are particularly conservative. With respect to residual effects of air emissions on

vegetation health, however, NG states "[g]iven the uncertainties in predictive air quality modelling, and the uncertainties about air emissions effects on vegetation health, the magnitude of effects of air emissions overall is given a conservative value of low." A conservative assumption would, however, have required giving it a value of high. By assuming the magnitude of effects of air emissions to be low, any conservatism built into the air quality dispersion and deposition modelling assessment methods has been eliminated.

Exhibit B3-5, pp. 83 and 88

678. NG refers to the *US EPA Office of Water, Watershed Protection* review of effectiveness for construction site erosion and sediment control measures which concludes that an average percent removal of total suspended solids (TSS) is about 70%. NG then characterizes this percentage as conservative and applies it to the effectiveness of TSS removal during construction for the proposed project. NG does not provide **any** rationale for concluding that relying on an average effectiveness is conservative. There is none. If NG had used the low end of a range, this might be a conservative approach. Using an average rate, however, cannot be relied on as conservative absent a clear demonstration that NG is expected to achieve a higher than average rate of TSS removal. NG has not demonstrated this.

Exhibit B3-8, p. 58

679. With respect to the assessment of watercourse crossings, NG has stated that a risk assessment was conducted for all watercourse crossings not covered by an Operational Statement, and that this was done to be conservative. In oral questioning, however, NG conceded that it is now aware that the Operational Statement for Powerlines it was intending to rely on in British Columbia is not actually applicable to its proposed project. The risk assessment therefore cannot be considered "conservative"; instead, it should be considered to be "unreliable".

Exhibit B3-9, p. 55 and 59-60
Mr. Anderson, Transcript Vol. 104, line 29697

680. The revised SQRA uses average failure frequency to assess risk.[139] In the original SQRA, touted as "highly conservative", the highest failure frequency was used.

Exhibit B196-2, p. 60, Figure 1
Mr. Mihell, Transcript Vol. 147, lines 20202-20205

681. The revised SQRA also presents mitigated FLOC (frequency of loss of containment) values for areas potentially subject to lateral spreading hazard; the original SQRA presented FLOC values in their unmitigated form. This further reduces the claimed conservatism of NG's assessment.

Exhibit B196-2, p. 85

[139] The SQRA is discussed in further detail at paras. 802 to 813 below.

682. NG identifies the EHHRA as highly conservative because it assumes a full bore rupture without mitigation. Enbridge's own experience in its massive Marshall Michigan spill shows this assumption to be grotesquely optimistic. There are, however, a number of aspects of the EHHRA that make it less conservative than NG claims. First, it assumes the amount of oil released by assuming a shutdown of the pipeline within 13 minutes of the rupture. Secondly, the shoreline sediment model within the EHHRA limits the concentration of shoreline loadings to a maximum value of 1,000 g/m^2 on the assumption that a high priority would be placed on the remediation of shorelines. Thus, NG has applied a mitigative factor of assumed spill response to the shoreline sediment modelling aspect of the EHHRA.

Exhibit B80-2, p. 64
Exhibit B80-3, p. 39
Dr. Stephenson, Transcript Vol. 147, lines 19589-19592

683. NG's claim that the assumptions and estimates it is relying on are conservative is flatly contradicted by the evidence. The examples identified above reveal a tendency to assume away significant issues in the assessment to dismiss effects. This is clearly demonstrated in the EHHRA.

Exhibit B132-2, pp. 51-63, spec. 59 and 63
NGP response to Haisla Nation IR No. 4.34 and 4.35

684. The Panel should view NG's claims of conservatism with scepticism and should accord little weight to these claims when they are relied on by NG to dismiss or to seek to minimize the degree and extent of effects from the proposed project.

2.2.2 False Confidence in Predictions

685. NG has also provided assessments of its confidence in its prediction of residual environmental effects, setting out whether its confidence in the accuracy of its predictions is low, moderate or high. NG states this prediction confidence is based on:

- scientific certainty relative to quantifying or estimating the environmental effect, including the quality and/or quantity of data and the understanding of the effect mechanisms; and
- scientific certainty relative to the effectiveness of the proposed mitigation measures.

Exhibit B3- 1, p. 66

686. NG's application shows that its confidence in its predictions is generally moderate with some notable examples of low prediction confidence. Low confidence means that the predicted effects may be considerably higher than anticipated, and mitigation may be less effective than hoped. Where a significance determination rests on a low prediction confidence, the significance determination must be considered unreliable. Even where a significance determination rests on a moderate confidence, the significance determination must be questioned.

687. A number of notable predictions where even NG has a low level of confidence are:

- Baseline and effects of soil acidification

  Exhibit B3-3, pp. 6-81

- Baseline data and availability for a number of wildlife key indicators and mitigation measures for some

  Exhibit B3-7, pp. 127-128

- Mitigation measures for change in movement of birds and mammals

  Exhibit B3-7, p. 147

- Mitigation measures for change in mortality to wildlife

  Exhibit B3-7, p. 179

- Effects on streamflow from water withdrawals and discharges

  Exhibit B3-8, p. 38

- Baseline data for waterbodies

  Exhibit B3-8, p. 95

- Effects of tunnel construction on water quality

  Exhibit B3-8, p. 95

688. Some of these low prediction confidences rest on an absence or paucity of baseline information, a factor that is completely in control of and could have been remedied by NG prior to submitting its application. NG chose not to do the work and now asks the Panel to make a determination on the basis of evidence that NG itself admits is unreliable.

689. Further, some of the prediction confidences that NG described as high are only said to be high once additional information is obtained in the future. This appears to be a misuse of the concept of prediction – a prediction can be verified through information that is obtained in the future, but the confidence in a prediction cannot be buttressed by information not yet obtained. NG is in effect saying we are confident that we are right based on information that we do not have but we hope to obtain in the future. These claims of high prediction confidence must be also rejected.

    Exhibit B3-4, p. 44

690. The fact that even high asserted prediction confidence must be questioned is demonstrated by NG's claim that it has a high level of certainty for significance evaluation of potential construction effects on the productive capacity of fish habitat due to the use of proven approaches to mitigating these effects. NG then asserts that where gaps in data exist or logistics for a given crossing are more complex, further studies will augment the understanding of potential effects and risk before permitting occurs. Testing of NG's evidence revealed data gaps for the crossings in the Kitimat River Valley.

    Exhibit B3-9, p. 109

691. NG has not done adequate habitat use surveys for watercourse crossings in the Kitimat River Valley for the proposed project and only proposes to do limited additional fish habitat surveys at watercourse crossings. Thus, the certainty with respect to significance of potential construction effects on productive fish habitat in the Kitimat River Valley must be augmented through additional studies before NG would have the information necessary to accurately determine a level of confidence.

Mr. Anderson, Transcript Vol. 104, lines 29426-29427

692. Further, in its discussion of surface water resources, NG discloses that there is a diminished degree of certainty associated with methods used to assess environmental effects of instream works on TSS concentrations.

Exhibit B3-8, p. 51

693. NG's claim that it has a high degree of certainty for significance evaluation of potential construction effects on the productive capacity of fish habitat in the Kitimat River is shown to not be reliable.

2.3 Testing of NG's Evidence Shows Unreliable Information

694. NG's evidence was tested through the Information Request process and through oral questioning. As a result, a number of aspects of NG's application have been shown to provide unreliable information.

2.3.1 Degree and Extent of Effects on Vegetation

695. The application provided by NG in its assessment of potential adverse effects on plants is unclear. The parameter of reversibility is misleading, as half the ROW area would remain cleared until after decommissioning. For any long-term effect on vegetation, this would not be reversed until at least two years after decommissioning. For forested ecosystems regeneration would take approximately 80 years.

Exhibit B3-4, p. 72
Exhibit B3-5, p. 59
Mr. Reid, Transcript Vol. 103, line 28701

696. Where NG has a low confidence in its predictions this is usually the result of inadequate baseline information. Where NG professes a moderate or high confidence in is predictions, the Panel must scrutinize the prediction confidence. A close review of the evidence may dictate placing low weight on the predictions when they rely on false confidence.

697. NG has not established a significance threshold for rare ecological communities generally, but acknowledges that the significance threshold for disturbance of ones that are red-listed in BC is 0% loss.

Mr. Reid, Transcript Vol. 104, lines 28948-28965

698. NG expects to affect 285 ha of rare ecological communities within the PDA of the Coast Mountain Physiographic Region by surface disturbance, including 24 ha of red-listed rare ecological communities. The red-listed ones are Sitka spruce / Salmonberry Very Wet

Maritime (15 ha), Lodgepole pine / Kinnikinnick (< 1 ha), and Sitka spruce / Salmonberry Very Wet Submaritime 1 (9 ha). In addition, Whitebark pine comprises 30 ha of the PDA in the Coast Mountain Physiographic Region and was listed as endangered in Schedule I of the *Species at Risk Act*[140] in June of 2012.[141]

Exhibit B3-5, p. 18

699. NG identifies the impacts to rare ecological communities in the Coast Mountain Physiographic Region as long-term, meaning they will not be reversed until at least two years after decommissioning.

Exhibit B3-5, p. 47

700. Further questioning identified that it is challenging to re-establish rare ecological communities and it will take 80 years or more:

- NG has stated that whether rare ecological communities can be re-established is uncertain, although it is possible that some may be re-claimed, so avoidance is the best mitigation.

  Exhibit B3-5, p. 43

- NG has also stated that the re-establishment of rare ecological communities is challenging and that the time-frame is uncertain.

  Mr. Reid, Transcript Vol. 104, lines 29107-29113

- NG has stated that 80 years or more would be required to re-establish rare ecological communities.

  Mr. Reid, Transcript Vol. 104, line 29120

701. NG has presumed it can mitigate effects on rare ecological communities by micro re-routing and other potential mitigation measures without knowing where the rare plant communities actually are.

Exhibit B3-5, p. 10 and 52
Mr. Reid, Transcript Vol. 104, line 28956

702. Despite the fact that NG estimates 24 ha of red-listed rare ecological communities and 30 ha of rare ecological communities listed as endangered under *SARA* in the Coast Mountain Physiographic Region will be impacted, and will not recover until two years after decommissioning, NG has concluded that the residual impact of surface disturbance on rare ecological communities will not be significant.

Exhibit B3-5, p. 47

703. When asked how a conclusion of not significant could be arrived at, NG was not able to provide a clear explanation, but referred to the text of its application at Exhibit B3-5, p. 52.

[140] *Species at Risk Act*, S.C. 2002, c. 29 (*SARA*).
[141] SOR/2012-133, June 20, 2012 (pursuant to PC 2012-837, June 19, 2012).

This text refers to mitigation through detailed assessment and site-specific mitigation prior to construction. The only effective mitigation will be avoidance, but NG does not have enough information to conclude that this will be possible. The determination that effects will not be significant is based on tenuous mitigation measures that may not be available due to a number of other project constraints.

Exhibit B3-5, p. 52
Mr. Green, Transcript Vol. 104, lines 29015-29018

704. The proposed project is likely to result in significant adverse effects to rare ecological communities and to old growth forested areas in the Coast Mountain Physiographic Region. It is unlikely that NG will be able to mitigate these effects in a reasonable way. The application is therefore unreliable when it comes to the assessment of significance of adverse effects to vegetation in the Coast Mountain Physiographic Region and in Haisla Nation Territory.

705. **Finding Requested: The Panel should determine that the proposed project is likely to result in significant adverse effects to rare ecological communities that cannot be mitigated.**

2.3.2 Degree and Extent of Effects on Wildlife

706. NG has acknowledged that the construction and operation of the pipeline will have adverse effects on wildlife. NG proposes to mitigate these effects through the use of timing windows and the removal of linear features. The likelihood that this mitigation will be successful has not been established.

Exhibit B3-7, pp. 129 and 152
Ms. Bryden, Transcript Vol. 103, lines 28065-28068, 28145 and 28396-28398
Mr. Green, Transcript Vol. 103, lines 28213-28214 and 28254-28255

707. NG has identified key indicator species for assessing effects on wildlife, grouping them in the following sub-headings:

- Forest-dependent bird species: Northern Goshawk, Barred Owl, Western Screech-Owl, Olive-Sided Flycatcher, and Wood Warblers
- Wetland-dependent bird species: American Bittern, Pacific Great Blue Heron, Trumpeter Swan, Sandhill Crane, Le Conte's Sparrow, Nelson's Sparrow, and Rusty Blackbird
- Grassland- and shrubland-dependent bird species: Sharp-tailed Grouse, Short-Eared Owl, Common Nighthawk, Sprague's Pipit, and White-Winged Scoter
- Ungulates: Moose, Woodland Caribou, and Mountain Goat
- Large carnivores: Grizzly Bear and Wolverine
- Furbearers: American Marten and Fisher

- Pond-dwelling amphibians: Canadian Toad, Western Toad, and Northern Leopard Frog

- Stream-dwelling amphibians: Coastal Tailed Frog

708. These key indicators are not fully representative of traditionally harvested animals. The Haisla Nation, as outlined in *Stewards* and in their submitted affidavits, relies on numerous animals that were not considered by NG in the *wa'wais* that the proposed pipelines will cross.

    Exhibit B3-6, pp. 37-43
    Exhibits D80-23-2 and D80-23-3

709. *Stewards* sets out the following wildlife harvesting evidence by *wa'wais*:

- *Na'labila*: Deer, mink, otter, fox and weasel are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, pp. 36-38

- *Niqwa* and *Wadin*: Deer, mink, marmot, fox, rabbit, beaver and otter are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, pp. 39-40

- *Uxdewala*: Deer, fox and mink are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, pp. 41-42

- *Giyu'yuwa:* Deer, fox, geese and beaver are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, p. 43

- *Laxakas*: Deer, beaver, ducks and geese are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, p. 45

- *Simqas* and *Zaqwis*: Deer, black bear, mink, fox, geese, and mallards are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, pp. 47-52

- *Yaksda*: Deer, mink, fox, geese and ducks are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, pp. 52-54

- *Bisamut'is* and *Wo'axdu*: Deer, mink, fox, otters, weasels, squirrels, geese and ducks are hunted and trapped for Haisla subsistence use.

  Exhibit D80-22-4, pp. 55-58

710. In addition, Haisla Nation members have attested to the following reliance on wildlife from the Kitimat River Valley: deer, moose, geese, ducks, black bears, goats, and rabbits.

Exhibit D80-23-2
Exhibit D80-23-3

711. In particular, geese, deer, rabbits, beavers, mink, marmot, foxes, otter, and ducks have not been assessed. NG's assessment of impacts to wildlife from the proposed project has focussed on impacts to habitat resulting in habitat loss, habitat fragmentation and on increased mortality due to an increase in linear feature density.

Exhibit B3-6, p. 19
Ms. Bryden, Transcript Vol. 103, lines 28065-28068, 28145 and 28396-28398
Mr. Green, Transcript Vol. 103, lines 28213-28214 and 28254-28255

712. NG has made preliminary determination of timing windows to reduce impacts to wildlife, and proposes to time construction in a way to minimize impacts to wildlife. Oral questioning has revealed, however, that wildlife will not always be a priority. NG says that it will reduce effects as much as it can, but admits that it will not eliminate them.

Mr. Anderson, Transcript Vol. 103, line 29718
Mr. Green, Transcript Vol. 103, line 27921

713. NG will be operating under a number of timing constraints when it is constructing its pipelines, and the feasibility of this mitigation may be constrained by other construction considerations, economic considerations, and engineering considerations.

Mr. Anderson, Transcript Vol. 104, lines 29574-29578

714. In oral questioning, NG repeatedly referred to the fact that a significant portion of the proposed pipeline ROW is planned for areas that are already disturbed. NG's application includes a table that sets out the percentage of previously disturbed area, excluding cutblocks. For the Kalum South Land Use Planning Area, which includes Haisla Nation Territory, NG's evidences shows that 14.9% of the PDA is already disturbed at baseline, but only 3.5% is already disturbed by ROWs. The disturbance level is much higher in Alberta. Further, NG identifies land use planning areas other than Kalum South as having the highest linear features densities.

Mr. Anderson, Transcript Vol. 101, line 25337
Mr. Green, Transcript Vol. 101, lines 25361 and 25691
Exhibit B3-6, p. 22
Exhibit B3-7, p. 176

715. In oral questioning regarding the impacts of increased linear features on the Narraway caribou herd, NG stated that 55% of the ROW is within 150 m of an existing linear access feature and another 40% goes through forestry cutblocks, with the result that NG estimated that about 70% of the pipeline ROW from Bruderheim to Kitimat goes through disturbed areas. NG then qualified these numbers by stating that the majority of caribou habitat is in areas where NG is following linear features. The level of pre-existing

disturbance in the Coast Mountain Physiographic Region would therefore be much less than the 70% figure offered in the context of caribou habitat areas.

Mr. Green, Transcript Vol. 101, lines 25343-25363

716. To mitigate the increase in mortality due to linear feature density, NG has committed to a no net gain in linear feature density. Therefore, for each linear feature created as a result of NG's project, NG will remove a linear feature from elsewhere on the landscape. NG's proposal to remove linear features will focus on removing human access.

Mr. Green, Transcript Vol. 105, lines 31978-31994 and 32027-32031

717. NG has acknowledged the mobility of predators as a key concern. Removing human access will not address the mobility of predators by way of linear features, so this alone will not be an effective deterrent to increased mortality due to predation unless it is coupled with active re-vegetation and ongoing monitoring to ensure the re-vegetation is successful.

Mr. Green, Transcript Vol. 101, line 25687

718. NG's evidence suggests that the linear feature removal will focus on areas with a high number of linear features and where the linear features are having significant negative effects to caribou and grizzly bear populations. As a result of this focus on population units, the linear feature removal that NG is planning does not appear to be aimed at compensating for linear feature creation on a landscape, physiographic region or traditional territory level. NG has made no commitment to no net loss of linear features in Haisla Nation Territory. Therefore, this mitigation cannot be relied on to eliminate significant adverse effects in Haisla Nation Territory.

Mr. Anderson, Transcript Vol. 105, lines 31975-31977

719. NG will not be consulting with Aboriginal groups in identifying the priority areas in which NG has committed to no net increase to linear feature density. NG will not be consulting with Aboriginal groups in the technical drafting of the Linear Features Management and Removal Plan. NG will only engage with Aboriginal groups once they have developed candidate ideas for a linear feature for priority areas.

Exhibit B46-36, p. 5
Mr. Anderson, Transcript Vol. 103, lines 28853-28862

720. NG cannot confirm that habitat availability will return to pre-disturbance conditions.

Exhibit B3-7, p. 112

721. Further, despite its commitment to linear feature removal to reduce impacts to wildlife, where NG's project requires the creation of a linear feature, its prediction confidence in mitigation measures for effects on caribou, grizzly and wolverine is low. Additionally, wildlife that is important to Haisla Nation for subsistence use, as outlined above, is not considered by NG in its linear feature removal plan.

Mr. Green, Transcript Vol. 102, lines 26484-26487

722. NG has concluded that effects to wildlife will not be significant. This conclusion is not supported with respect to caribou, grizzly and wolverine. Further, NG has not demonstrated that this is supportive with respect to beaver, fox, geese or other wildlife used by the Haisla Nation for subsistence.

2.3.3 Degree and Extent of Effects on Fish and Fish Habitat

723. NG acknowledges that the Kitimat River is a high consequence area with sensitive fish habitat. Important fish species are present in the Kitimat River every month of the year.

Mr. Anderson, Transcript Vol. 104, lines 29626-29629
Mr. Anderson, Transcript Vol. 104, line 29305
Exhibit B39-21, Attachment Haisla Nation IR 1.49d)

724. NG will be crossing watercourses in the Kitimat River Valley, although how many is unclear as NG's evidence is inconsistent. NG's application identified a total of 219 stream crossings in the Kitimat River drainage. NG's Reply evidence stated that it will cross 95 watercourses between the Hoult Tunnel West portal and the proposed Kitimat Terminal site. NG's updated aquatic catalog for KP1083 to KP1172 incudes catalog sheets for 123 watercourse crossings.

Exhibit B11-1, p. 13
Exhibit B83-2, p. 20
Exhibit B194-2 to B194-8, NGP Response to Undertaking U55

725. Of the 95 watercourse crossings identified in NG's Reply evidence, 79 of these are fish-bearing. Even those which are not fish-bearing will be routes for NG's spills to flow downstream into the Kitimat River and Estuary and impact on fish-bearing waters.

Exhibit B83-8, p. 20
Mr. Anderson, Transcript Vol. 147, lines 20452-20453
Mr. Engelsjord (DFO), Transcript Vol. 107, lines 3337-3338

726. Watercourse crossings carry with them a degree of risk to fish and fish habitat based on construction methods. One of these is disturbance of bottom substrates and associated downstream movement of sediments. The full extent of these risks for watercourse crossings is set out in the pathways of effects illustrated in NG's application.

Exhibit B3-8, p. 79
Exhibit B3-10, pp. 2-20

727. NG has not provided baseline data for the proposed watercourse crossings that allows for a determination of least risk periods (LRPs). A precautionary approach suggests assuming that there is no LRP for any watercourse crossings where one has not been positively identified. NG's lack of due diligence in this regard underlines a cavalier approach to Haisla Nation aboriginal rights and interests.

728. Watercourses in the Kitimat River drainage are subject to rapid changes in flow that can increase the risk of impacts and effects from open trench crossings and that can extend the downstream reach of effects.

Exhibit B3-8, pp. 58 and 79

729. Even for a small stream, conducting an open cut crossing will take one to two days of instream work. Construction would have to be managed so that during flash event or rainfall during construction, water can be prevented from entering the channel during in-stream construction through pumping and isolation techniques. NG has acknowledged that work must be timed to take advantage of weather conditions and not conducted when there are strong flows through a stream. If necessary, water must be controlled to avoid sedimentation. A failure to do this could have implications not only for fish and fish habitat but also for long-term pipeline integrity.

Mr. Cavers, Transcript Vol. 147, lines 20451, 20466-20468 and 20456
Mr. Anderson, Transcript Vol. 147, line 20440

730. NG has acknowledged the importance of constructing a safe crossing which is going to perform well for the entire length of operation of the pipeline in combination with a crossing which does not cause downstream sedimentation and turbidity, which can be harmful to the fish and fish habitat. NG has not provided enough information to date to determine whether the risks and potential effects from open trench crossings can be mitigated during construction.

Mr. Cavers, Transcript Vol. 147, line 20456

731. Peak discharges are greater in the Coastal Mountains hydrological zone than in the other hydrological zones for comparably sized watersheds. Tributaries to the Kitimat River can vary in flow and tend to be quite flashy in nature so a rain event could increase the discharge of a watercourse very quickly.

Exhibit B83-10, p. 39
Mr. Anderson, Transcript Vol. 104, line 29358

732. The tributaries to the Kitimat River, whether fish-bearing or not, have the potential to have impacts on fish and fish habitat in the Kitimat main stem. The entire Kitimat main stem is used by salmon for spawning, and the most used salmon spawning areas in the Kitimat main stem are at the confluence of tributaries and in braided sections. The Kitimat River supports a diminished population of eulachon – a species of anchor cultural importance to the Haisla Nation; one the Haisla Nation has been working for years to protect and rehabilitate.

Exhibit B83-8, p. 21
Exhibit D80-24-2, pp. 6-17

733. Most of the water courses in the Kitimat River drainage do not have a LRP for instream construction. For those that do have a LRP, that period is limited to the period of August 1 to August 31.

Exhibit B11-1, p. 140

734. Given the propensity for rainfall and flashy events in the Kitimat River Valley, NG should be required to use trenchless crossing methods at watercourse crossings without LRPs.

735. NG has not done habitat use surveys through multiple times of the year for watercourse crossings in the Kitimat River drainage for the proposed project. NG only proposes to do additional fish habitat surveys at watercourse crossings that do not have a least risk window and where NG is not proposing to use directional drilling or other avoidance methods, and this only for those times of year that it would be proposing to be crossing the watercourse. Yet, directional drilling and other avoidance methods can result in adverse impacts to fish and fish habitat.

Mr. Anderson, Transcript Vol. 104, lines 29426-29427
Mr. Anderson, Transcript Vol. 104, lines 19434-19435
Mr. Anderson, Transcript Vol. 104, lines 29499-29451

736. Further, NG is not proposing or even considering trenchless methods for at least 10 watercourses in the Kitimat River drainage which do not have LRPs.

Exhibit B170-1, NGP Response to Undertaking U56

737. Without knowing what fish and other aquatic species use the watercourses at or downstream of proposed crossing locations, it is not possible for NG or for the Panel to make a prediction of the degree and extent of potential adverse environmental effects to fish and fish habitat.

738. NG estimates at least 31,070m^2 of HADDs resulting from watercourse crossings in the Kitimat River drainage. The most effective way to mitigate potential HADDs is through avoidance. Where this is not possible, suitable crossing methods should be used to minimize potential HADDs. Where there is no least risk period for instream construction, suitable crossing methods should avoid any instream work.

739. Fisheries Oceans Canada has acknowledged that the effectiveness of its habitat compensation requirements ranges from 60-80%. Thus, NG's conclusion that habitat loss can be offset by habitat compensation such that adverse environmental effects will not be significant is not supported by the evidence. Habitat compensation may only mitigate as little as 60% of the adverse effects.

Mr. Fanos (DFO), Transcript Vol. 107, lines 3645-3649
Exhibit B3-9, p. 132

740. Further, NG has not assessed the extent to which the amount of HADD estimated to result from the proposed project can have cumulative watershed level effects.

Exhibit B47-18
Mr. Anderson, Transcript Vol. 104, lines 29638-29643

741. The Panel has included in its proposed potential conditions a number of conditions for watercourse crossings, including ones requiring the filing of additional information relating to watercourse crossing design and least risk periods. This requirement for additional information does not remedy the information gaps that exist now, in the project review phase, and the implications of these information gaps for the ability to reasonably assess the proposed project. This potential condition is discussed further in Section VIII below.

742. NG's ESA does not support concluding that the proposed project will not have significant adverse environmental effects on vegetation, wildlife or fish and fish habitat that cannot be mitigated.

2.3.4 NG Has Not Assessed All Project Activities

743. NG has chosen not to conduct an assessment of the environmental and socio-economic effects for the following aspects of the project:

- additional access roads
- equipment caches for spill response
- staging areas for spill response

744. NG has not developed detailed access plans for the proposed project. NG has acknowledged that additional access roads beyond the PDA may be required for construction and spill response planning purposes. NG's ESA has not considered all the access roads that may be required for construction and operations.

Transcript Vol. 91, line 13916
Mr. Doering, Transcript Vol. 97, lines 20860 and 20866-20868
Mr. McHugh, Transcript Vol. 147, lines 19828-19829
Transcript Vol. 104, lines 29151-29157

745. NG's anticipated spill response planning includes the creation of equipment caches in remote and difficult to access areas, a particularly in the Kitimat River drainage. NG has not assessed the environmental and socio-economic effects of equipment caches.

Exhibit B83-10, p. 23
Transcript Vol. 147, lines 19952-19955

746. NG's anticipated spill response planning includes the development of staging areas for spill response, including in the Kitimat River Valley and regular clearing of these areas. These potential staging areas were not included in NG's ESA and the impacts associated with the clearing of staging areas has not been assessed.

Exhibit B83-10, pp. 22 and 29

747. In summary, NG's ESA has failed to consider the disturbances associated with additional access roads for construction or spill response, or equipment caches and staging areas for spill response. NG is therefore unable to confirm that there will be no significant adverse environmental effects associated with additional access, equipment caches, staging areas or additional infrastructure to support spill response. Further, as these are components of the proposed project, the failure to include them in the project ESA means that NG's assessment of project effects is based on incomplete information. This also means that cumulative effects have not been properly assessed.

748. **Finding Requested: The Panel should find that NG's ESA does not support a reasonable conclusion that the proposed project is not likely to cause significant adverse environmental effects.**

2.4 Gaps in Assessment of Adverse Effects and Significance

749. NG's assessment of adverse effects and the significance of these adverse effects is not transparent and fails to consider the aboriginal perspective of impacts.

750. The *Scope of Factors* specifically requires the proponent to:

> … identify the criteria used to assign significance ratings to any predicted adverse effects.
> …
> It must contain clear and sufficient information to enable the Panel, Aboriginal peoples and the public to understand and review the proponent's judgment of the significance of effects. The proponent must define the terms used to describe the level of significance.
>
> *Exhibit D122-3-13, p. 19*

2.4.1 Lack of Transparency and Clarity Regarding Significance Assessment

751. NG has stated that it has arrived at its determination of significance by using standards or thresholds that are specific to the Valued Environmental Component (VEC), key indicator (KI), and/or the measureable parameters used to assess the environmental effects. NG has also stated that standards are recognized government or industry objectives for physical aspects, and thresholds reflect limits based on "an acceptable state for an environmental or socio-economic component based on resource management objective, community standards, scientific literature, or ecological processes.

> *Exhibit B3- 1, p. 62*

752. With respect to determination of significance for vegetation, NG has stated that effects are determined to be significant or not significant, based on defined thresholds as well as "professional judgment". NG has set out defined thresholds for change in surface disturbance of 10% for ecosystem units, old growth forests, and wetlands, but does not disclose how these thresholds are arrived at.

> *Exhibit B3-4, p. 73*

753. For the significance thresholds for surface disturbance to ecosystem units, old growth forests and wetlands, NG has provided no context based on resource management objectives, community standards, scientific literature or ecological processes. The inability to demonstrate how the significance assessment is linked to impacts is further demonstrated in oral questioning of NG's experts on vegetation.

754. NG takes the position that the tables provided in the ESA are summaries, it is the text that contains the critical information. The text, however, does not reveal the extent to which the significance assessment is based on the assessed parameters and generally concludes that mitigation will be applied so that the effects will not be significant.

> *Mr. Green, Transcript Vol. 104, lines 29015-29018*

755. NG's evidence regarding significance of adverse effects is misleading. This is demonstrated by the discussion of adverse effects to old growth forests in the Coast Mountain Physiographic Region and at the Kitimat Terminal. For the Coast Mountain Physiographic Region, the ESA states:

> *Old Growth Forests*
> Old growth forests occupy 181 ha of the PDA (12% of the PEAA). If the mitigation measures are followed, then old growth forests can be restored over a long period. The threshold is a loss equal to or greater than 10% of the area of old growth forests. Therefore, the effects of clearing on old growth forests will be significant (see Table 8-58). However, following mitigation, the residual effect will be not significant.
>
> *Exhibit B3-5, p. 52*

756. When questioned about whether the residual effects tables in its application don't already include consideration of anticipated mitigation, NG stated that they "consider the general mitigation measures that are outlined in the Application … but they do not consider site specific measures" that NG may implement.

> *Mr. Anderson and Mr. Green, Transcript Vol. 104, lines 29012-29018*

757. The mitigation measures available for old growth forests are pipeline re-routing and other avoidance by limiting extra workspace and grubbing. NG has not conducted the requisite level of mapping to show it is possible to avoid old growth forest areas. This was confirmed by NG when it stated that it does not have up-to-date mapping of old growth forest areas.

> *Mr. Reid, Transcript Vol. 104, line 29103*

758. In oral questioning, NG referred to mitigation through avoidance and also through restoration of old growth forests over a long period of time. NG has not, however, provided any additional evidence to demonstrate that it will be able to avoid old growth forests in the Coast Mountain Physiographic Region. Bear in mind, also, that the 12% effect in the PEAA is from surface disturbance that has been assessed. It does not include additional potential disturbance from activities that have not been assessed, as set out in section 2.3.4 above.

> *Exhibit B3-5, p. 43*
> *Mr. Reid and Mr. Anderson, Transcript Vol. 104, lines 29029-29038 and 29090-29104*

759. NG's conclusions regarding reversibility do not appear to accord with recent NEB decisions assessing the adverse environmental effects under *CEAA*. In *Nova Gas Transmission Line Ltd.*,[142] the NEB outlined its significance assessment criteria. Its reversibility criteria provided 3 possible ratings: reversible, possible, irreversible.[143] A reversible adverse effect was one which was expected to return to baseline conditions

[142] NEB Reasons for Decision, *NOVA Gas Transmission Ltd.*, GH-2-2010, January 2011 [NOVA Gas].
[143] *NOVA Gas*, p. 99.

within the life of the project. Adverse environmental effects were deemed irreversible if they would be permanent, or reversible beyond the lifecycle of the project.

760. Further, restoration of old growth forests will take at least 80 years after decommissioning. NG concludes that this is a reversible effect.

Exhibit B3-5, p. 47, Table 8-58

761. If the expected life of the project is set at 50 years, the lost old growth forest will not be restored for at least 130 years.

762. NG is deeming project effects that are long-term to be reversible. NG has categorized all the project effects on vegetation in the Coast Mountains as reversible. NG has also characterized all these effects as being of long-term duration. Long-term duration is described by NG as continuing for more than 2 years after decommissioning.

Exhibit B3-5, p. 47, Table 8-58
Exhibit B3-5, p. 57

763. NG's characterization of an effect as reversible is clearly inconsistent with the criteria used by the NEB in assessing the NOVA Gas Transmission Line project. The Panel should therefore be cautious in relying on NG's assertion that an environmental effect is reversible when assessing significance of adverse effects. Further, although this effect may be considered reversible, it will not be reversed within the human lifespan, and will not be reversed over the course of about 5-6 generations of Haislas.

764. NG contends that none of the impacts from the proposed project will result in significant adverse environmental effects which cannot be mitigated. The Haisla Nation disagrees. In many instances NG has not done enough work to know the degree and extent of the potential effects. The baseline information is simply lacking.

765. In addition, NG has made significance determinations that are not based on a true assessment of the extent and duration of the impact, but rely on a subjective consideration of other factors to arrive at a determination of non-significance. This subjective assessment is based on thresholds that are not explained and mitigation that is not supported by an adequate knowledge base. The assessment is thus not transparent, so it cannot be properly reviewed or its accuracy determined.

766. NG has failed to provide the level of detail required under the *Scope of Factors*. These deficiencies in NGs application are demonstrated clearly with respect to vegetation clearing and stream crossings (see paras. 664 to 669).

767. NG proposes to use micro re-routing as site-specific mitigation to avoid clearing rare ecological communities and old growth forest. NG will be operating under a number of other routing constraints, including geohazards, fisheries values and competing projects. In addition, NG has not conducted mapping that is detailed enough for it to say with any certainty that it will be able to micro re-route.

768. NG intends to rely on Fisheries and Oceans Canada's authorizations for HADDS and approval of fish habitat compensation plans to mitigate adverse impacts of watercourse crossing on fish habitat. As set out above, given the rate of success for fish habitat

compensation has been shown to be about 60-80%, NG can only count on mitigation of 60% of the effects of HADDs, with up to 40% left unmitigated. NG's significance assessment relies on 100% mitigation, which is not supported by the evidence.

2.4.2 Aboriginal Perspective of Effects and Significance not Incorporated into ESA

769. The ESA was described by NG to have been done to comply with the *CEAA 2012* requirements and the *Terms of Reference* for the JRP review of the proposed project. Conclusions relating to significance of adverse effects were limited to an assessment under *CEAA 2012*. The *CEAA 2012* requirement for assessing environmental effects includes a limited requirement for assessing effects on aboriginal people. Section 5(c) of *CEAA 2012* includes in the definition of environmental effects the following:

> (*c*) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on
>
> i. health and socio-economic conditions,
> ii. physical and cultural heritage,
> iii. the current use of lands and resources for traditional purposes, or
> iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. [144]

770. NG has itself further limited the assessment of effects from the project to health and socio-economic conditions and impacts to the availability of species for traditional use.

771. NG relies on its conclusion that there will be no significant adverse effects on the abundance and distribution of valued environmental components or to environmental quality to support its conclusion that the availability of species for traditional use should not be affected, and therefore the ability of traditional harvesters to reach resources should not be affected.

> *Mr. Green, Transcript Vol. 120, lines 27226-27228 and 27240*

772. NG has not reached any conclusions about the impacts to cultural or spiritual values flowing from the environmental effects of the proposed project. The "significance" conclusion in the NG ESA is not an assessment of significance from an aboriginal perspective.

> *Mr. Green, Transcript Vol. 120, line 27241*
> *Mr. Green and Mr. Anderson, Transcript Vol. 103, lines 27993-28106*

773. In response to questioning on impacts of the marine terminal and significance determination, NG referred to the integration of context, such as land use zoning into determinations of significance. NG has only relied on context which allows it to profess lower significance but has ignored context which points to higher significance. Further, the *CEAA Reference Guide*[145] for determining significance identifies the following as relevant context for determining significance:

[144] *CEAA 2012,* s. 5(c).
[145] *CEAA Reference Guide: Determining Significance of Adverse Effects.*

> The adverse environmental effects of projects may be significant if they occur in areas or regions that:
>
> - have already been adversely affected by human activities; and/or
> - are ecologically fragile and have little resistance to imposed stresses.

774. This Guide does not suggest in any way that potential future land use allows a downgrading of significance of effects.

775. NG characterized the potential future land use as relevant to setting what may or may not be an acceptable change. A land use plan, however, is not an authorization under *CEAA 2012* and has not gone through a *CEAA 2012* significance assessment.

> *Mr. Green, Transcript Vol. 113, lines 12450-12462*

776. Specifically, NG has acknowledged that it is reasonable to assume that Aboriginal people will have different views about effects than has been concluded in NG`s ESA:

> **28005**. My last statement is that I think it's reasonable to assume that Aboriginal people will have different perceptions in some cases than perhaps what's been spoken to in the environmental assessment. And that really is the purpose of the process we're dealing with, is to allow people to express their opinions on the determinations that we've made.
>
> *Mr. Green, Transcript Vol. 103, line 28005*

777. NG has failed to consider the aboriginal perspective on significance of effects, despite having identified that significance thresholds can be informed by factors such as community standards. Nowhere in its ESA has NG identified Aboriginal group community standards and whether or how they have been considered in the determination of significance thresholds.

778. NG has received extensive information from Aboriginal groups, including the Haisla Nation, about the use of lands, waters and resources, about governance, about culture and about cultural heritage. NG has failed, however to integrate this information into its assessment. NG's defence when asked about this was consistent: it did not think it would affect the outcome of its assessment and it intends to use on a go-forward basis only.

> *Mr. Anderson, Transcript Vol. 150, lines 23049-23050*
> *Mr. Green, Transcript Vol. 149, lines 22583-22587*
> *Mr. Green, Transcript Vol. 154, lines 29623-29625 and 29663-29666*
> *Mr. Carruthers, Transcript Vol. 153, lines 27793-27797*
> *Exhibits D80-22-4, D80-23-1 to D80-23-3 and D80-24-2 to D80-24-11*

779. NG's assessment of whether the proposed project will have significant adverse effects has not included consideration of the aboriginal perspective on significance. By simply relying on its conclusion that there will be no significant adverse effects to the abundance and distribution of valued environmental components or on environmental quality, NG has not conducted a reasonable assessment on current use of lands and resources for traditional purposes.

780. The potential for effects to health and cultural heritage, in particular, are inadequate for the Panel to make a reasonable assessment of adverse effects, potential mitigation, or significance.

781. **Finding Requested: The Panel should find that the proposed pipelines are likely to cause significant adverse environmental effects.**

3. Pipeline Accidents and Malfunctions

782. The previous discussion has examined the impacts from the construction and routine operations of the proposed pipelines. The assessment of the proposed project also requires an assessment of the effects of accidents or malfunctions on the environment. This section will focus on accidents or malfunctions during the operation of the proposed pipelines that lead to the spill of diluted bitumen, synthetic crude or condensate[146] into the environment in Haisla Nation Territory.

783. The potential for accidents and malfunctions to result in significant adverse effects that cannot be mitigated requires an assessment of the likelihood of an accident or malfunction, the degree and extent of effects, available mitigation, and residual effects. All of this requires an adequate foundation of baseline information.

3.1 Information Gaps

784. NG has not provided enough information to properly assess the effects of an accident or malfunction during the operation of the pipelines that result in a release of liquid hydrocarbons to the environment.

3.1.1 Lack of Adequate Information Regarding Geohazards

> … the level of detail provided in the Enbridge Application does not allow one to assess whether the stability enhancements will be able to adequately reduce the landslide risk.
>
> *Exhibit D80-27-16, pp. 6-7*

785. Paragraphs 641 to 653 above sets out in detail the information gaps relating to geohazards in the Kitimat River Valley. This lack of information is significant; it is relevant not only to construction challenges but also to accidents or malfunctions, informing likelihood, degree and extent of effects and mitigation.

> The pipeline route is most susceptible to terrain stability as it approaches and crosses the Coastal Ranges towards Kitimat.
>
> *B80-27-16, p. 9*

786. NG has acknowledged that the Kitimat River Valley is geographically and topographically challenging, that NG does not have a full geohazards picture, and that NG does not have a good understanding of the meteorology.

[146] The word "oil" is sometimes used to refer to diluted bitumen, synthetic crude, or condensate.

Mr. Cavers, Transcript Vol. 86, lines 6195-6200
Transcript Vol. 148, lines 22280-22289
Transcript Vol. 148, lines 22305-22321

787. NG acknowledges that it needs more information on geohazards in the Kitimat River Valley.

> Geohazards in specific areas such as the Upper Kitimat Valley and watercrossings in Western Alberta represent the highest level of threat to the pipeline system. Northern Gateway will design the pipeline system based upon detailed identification of geohazards, specific engineering design, and application of Project-specific operating procedures to address these threats.
>
> *Exhibit B196-2, p. 42*

788. The geohazards in the Kitimat River Valley are exacerbated by climatic conditions. Peak discharges in the Kitimat River drainage are significant. NG describes peak discharges in the Coastal Mountains hydrological zone as "greater than in the other hydrological zones for comparably sized watersheds". In addition, tributaries to the Kitimat River can vary in flow and tend to be quite flashy. A rain event could increase the discharge of a watercourse very quickly.

Exhibit B83-10, p. 39
Mr. Anderson, Transcript Vol. 104, line 29358

789. The Panel has proposed a condition requiring NG to file, at least six months prior to commencing construction, a final Geohazard Assessment, Mitigation, and Monitoring Report that describes, *inter alia*, the specific and combined geohazards identified that could have a reasonable probability of impacting the Project.

Exhibit A346, Potential Conditions 75-77

790. This proposed potential condition recognizes a lack of information about specific and combined geohazards that could have a reasonable probability of impacting the proposed project. The information is needed much earlier than post-approved, though. The information described as required in potential conditions 75 to 77 is information required to assess whether the proposed project is likely to result in significant adverse environmental effects that cannot be mitigated.

791. These are critical aspects that inform both the risk of an accident or malfunction and the ability to respond in a meaningful way. Despite this lack of baseline information, NG has proceeded to characterize the likelihood of accidents or malfunctions from the pipeline in the Kitimat River Valley, the extent and degree of effects, and mitigation. The gaps in the available geohazard information undermine the validity of NG's conclusion regarding likelihood of an accident or malfunction, degree and extent of effects, and mitigation.

3.1.2 Lack of Information on Fish and Fish Habitat

792. NG does not have enough information about fish and fish habitat in the Kitimat River drainage to be able to assess the degree and extent of effects of a spill of oil into the

Kitimat River. Fisheries and Oceans Canada has provided evidence that salmon juveniles of different species are present in the Kitimat River Estuary throughout all times of the year.

Mr. Groves (DFO), Transcript Vol. 167, line 16841

793. NG has not done habitat use surveys through multiple times of the year for watercourse crossings in the Kitimat River Valley for the proposed project. While NG proposes to do additional fish and fish habitat surveys, it only proposes to conduct this work at watercourse crossings that do not have a least risk window and where NG is not proposing to use directional drilling or other avoidance methods for those times of year that it would be proposing to be crossing the watercourse.

Mr. Anderson, Transcript Vol. 104, lines 29426-29427
Mr. Anderson, Transcript Vol. 104, lines 19434-19435

794. As a result, the potential effects of a spill of oil and the extent to which emergency response activities themselves could impact fish and fish habitat cannot be reasonably assessed.

3.1.3 Lack of Real-World Data for Kitimat River Modelling

795. NG has attempted to understand how a spill of oil or condensate into the Kitimat River would behave and has discussed this in its *Economic and Human Health Risk Assessment* (*EHHRA*). The *EHHRA* sought to model spills into various rivers, including the Kitimat River. NG has described models as cartoons of reality. They all rely on input data, and the input data affects the outcome. The nature of the model used also affects outcome. The more closely the input data reflects real-world conditions, the more likely the modelling outcome will approximate real-world outcomes.

Dr. Maki, Transcript Vol. 133, lines 660-661
Dr. Horn, Transcript Vol. 97, lines 20583-20590
Dr. Stephenson, Transcript Vol. 97, lines 20591-20600

796. The *EHHRA* relies on high and low mean monthly flow rates as input data. These flow rates are derived from discharge data that is derived mathematically from discharge measured at only one location on the Kitimat River, at the south end near Hirsh Creek. Three types of information, two based on ArcGIS data and one based on a personal communication from AMEC on behalf of NG, were used to establish a relationship to calculate the flow rates.

Dr. Horn, Transcript Vol. 146, lines 19384-19393
Exhibit B80-3, pp. 73-76

797. NG failed to actually measure discharge at various points along the Kitimat River to support the *EHHRA*. NG defends the modelling based on representative high flow and representative low flow as "[encompassing] a good portion of the season".

Dr. Horn, Transcript Vol. 146, lines 19448-19449

798. The modeled current velocities used by NG in the *EHHRA* do not match the current velocities measured at the Orange Bridge, which is the one location on the Kitimat River for which such velocities exist.

> **19573. DR. MATTHEW HORN:** The exact current velocities do not match the Orange Bridge and we need to take into account that those velocity measurements taken at that Orange Bridge are at a point at a given time and that may not necessarily be representative of the high flow case that we modelled or the low flow case.
>
> *Dr. Horn, Transcript Vol. 147, lines 19571-19573*

799. When the mathematically derived discharge and current data were compared to actual velocity measurements at one location, it was found the Jobson relationship was not providing appropriate velocities for the Kitimat River, so an adjustment factor was made. NG does not set out whether this adjustment resulted in more accurate velocity and did not undertake to obtain any additional velocity measurements to determine this.

> *Exhibit B80-3, p. 82*
> *Dr. Taylor, Transcript Vol. 146, lines 19396-19399*

800. It is clear from NG's discussion of its proposed spill response planning that it will eventually have to collect discharge and velocity data to determine whether the preliminary river control points it has identified will in fact be useful locations for seeking to contain spilled oil. The *EHHRA* would have vastly benefitted from real-world information about discharge and velocity. The failure to base the *EHHRA* on such data brings into question its reliability as a predictive model.

801. NG's refusal to fully study and understand geohazards in the Kitimat River Valley, to conduct fish and fish habitat studies in the Kitimat River, to gather empirical discharge and velocity measurements, and to conduct vegetation surveys in the Kitimat River Estuary, all leave significant information gaps which undermine the results of the assessment of potential adverse effects associated with the proposed project. Further, these information gaps prevent a reasonable assessment of the risks associated with an accident or malfunction.

3.2 NG's Risk Assessment is Inadequate

802. NG's risk assessment has failed to adequately assess risks, including geotechnical risk, has failed to fully acknowledge the limitations of leak detection methods, and does not properly acknowledge past operator failings. Coupled with the uncertainty associated with the degree and extent of effects from a spill and the ability to respond effectively to clean up a spill, the evidence before the Panel supports a conclusion that the proposed project is likely to result in significant adverse environmental effects.

3.2.1 Geotechnical Risk Not Adequately Assessed

803. NG has presented three risk assessments for the pipeline: the early risk estimate for Route revision U based on incident data (Exhibit B3-20), the SQRA Semi-Quantitative Risk

Assessment (Exhibit B75-2 (replacing B69-2), filed May 10, 2012); and the Revised SQRA (Exhibit B196-2, filed February 11, 2013).

804. The Route Revision U risk assessment that was filed as part of the application in May 2010 has been supplanted by the "original" SQRA.

Mr. Mihell, Transcript Vol. 86, line 6210

805. The original SQRA revealed the Kitimat River to have the highest calculated probability of a full bore rupture, mostly due to geohazards. This is displayed clearly in Table 5 of the original SQRA.

Exhibit B75-2, p. 36

806. The original SQRA has been replaced by the revised SQRA, which is described as "[providing] a consolidated document that reflects the changes to the design basis and the route since the previous filing based on Route Rev U, as well as updates that were provided during the IR process in August and September of 2012."

Exhibit B196-2, p. 9

807. This description of the revised SQRA is misleading with respect to its comparability to the original SQRA and the extent to which route revisions and design changes have resulted in reduced risk. It states that it facilitates a comparison in results between the original SQRA and the revised SQRA, and it suggests that the reduction in the return period for a full-bore rupture has gone from 240 to 464 years as a result of increased wall thickness and additional geotechnical assessments.

Exhibit B196-2, p. 2

808. These claims are false. While the revised SQRA incorporates additional mitigating factors, including route revisions and additional design features such as increased pipeline wall thickness and valve spacing changes, it also uses a different approach to failure frequency characterization. The "original" SQRA used the highest failure frequency for each segment and the revised SQRA is based on the average failure frequency for each segment.

Mr. Mihell, Transcript Vol. 147, lines 20201-20202 and Exhibit B196-2, p. 60, Figure 1

809. When asked whether using average failure frequency instead of highest failure frequency had reduced the conservative nature of the assessment, NG provided an Orwellian doublespeak response in which it characterized the revision as having removed "excessive over-conservatism" and as "improving the resolution of results".

Mr. Mihell, Transcript Vol. 147, lines 20208

810. The revised SQRA cannot be relied on to determine the extent to which route revisions and additional design features have contributed to reduction in risk. Although Mr. Mihell did not provide a direct answer to the question of whether these two studies can be compared, the inference from his reference to other documents that show the effect of increased wall thickness on failure likelihood must be taken as confirmation that the revised SQRA cannot be directly compared to the original SQRA.

Mr. Mihell, Transcript Vol. 147, lines 20217-20222

811. NG characterized its original SQRA as highly conservative and the revision as having removed "excessive over-conservatism", improving the resolution of results. NG provided no evidence that its original SQRA was overly conservative.

Mr. Mihell, Transcript Vol. 147, lines 20208

812. In fact, the purported removal of the "excessive over-conservatism" has not changed the resolution of the results at all, it has just changed the results. It is not possible to discern whether the claimed increase in the return period for the Kitimat River is attributable to route revisions, design features or the reliance on average vs. maximum failure frequency.

813. The revised SQRA still shows the Kitimat River as having the shortest return period for a full bore rupture, again mostly due to geohazards. Despite the increase in the return period for the Kitimat River, the return period for the Kitimat River is still shorter than the next shortest return period for the high consequence watercourses in the original SQRA.

Exhibit B196-2, p. 37

814. The evidence provided by NG does not demonstrate that geotechnical risk has been reduced to an acceptable level in the Kitimat River Valley. Further, NG has not made design choices suitable for these risks.

3.2.2 NG`s Design Choices are Increasing Risk

815. NG's "risk-based" design approach fails to aggregate risk along the length of the proposed pipelines. As a result, the mean return period (MRP) for spills is underestimated. The MRP of a spill anywhere along the pipeline is significantly shorter than the MRP of a spill in any specific segment of the pipeline.

816. For example, in Table 3-2 of *Volume 7B: Risk Assessment and Management of Spills: Pipelines*, the smallest MRP for a medium spill is 118 years (Interior Plateau). The 118 MRP does not represent the actual aggregated risk. Since risk is aggregated along a distributed, non-point, structure like a pipeline, the return period for an event at any point along the pipeline will actually be much lower. NG has not submitted any information about aggregated risk for the proposed pipelines. Without this information, it is not possible to calculate a MRP based on aggregated risk, and therefore not possible to assess actual risk.

Exhibit B3-20, p. 20
Exhibit D80-27-14, p. 8
Dr. Malhotra, Transcript Vol. 109, lines 5713 and 5729-5736

817. Notably, the MRP for small spills was not even presented. This number will be lower, as small spills occur at a much higher frequency.

818. NG acknowledged agreed during questioning that the provision of spill return periods for small spills would be helpful and agreed to supply that data if requested. The Haisla Nation specifically requested that NG provide spill return periods for small spills in a

written request for an undertaking. NG agreed to provide a response to the undertaking. However, in responding to the undertaking, NG adopted a non-comparable set of release categories for characterizing release magnitudes and presented no data specific to the category of "small spills" as described in the NG application materials.

Mr. Kresic, Transcript Vol.93, line 15214-15219
Exhibit D80-85-1, p. 2
Mr. Langen (legal counsel), Transcript Vol. 97, lines 20137-20140
Exhibit B195-1

819. The Haisla Nation submits that the use of alternative release category measures following the agreement of NG to provide information relating to small spills constituted a failure to satisfy the undertaking and demonstrates NG's unwillingness to provide a transparent risk assessment.

820. Further, NG's selection of a stress-based design raises concerns. In areas which can be affected by ground motions from soil settling, freeze/thaw cycling, landslides or seismic vibration, best practice dictates the use of strain-based design on buried pipelines.

Exhibit D80-27-16, pp. 13

821. Soil settling, freeze/thaw cycling, landslides or seismic vibration all contribute to additional loading on a pipeline, and each of these stressors is a distinct and real possibility in much of the upper Kitimat Valley and Coast Mountain regions of the pipeline route.

822. Given that NG admits the need to conduct further geotechnical work, choosing a stress-based design is not conservative: it adds to risk. NG has failed to submit any detailed analyses showing that a stress-based approach is adequate and appropriate in a region notable for numerous and varying geohazards. Far more detail is required to assess how the proposed pipelines will react to the various stresses which might occur in certain areas and how the resulting strains might deform the pipelines.

823. NG's failure to conduct a reasonable level of geotechnical work means that it is not possible to assess, at this point in time, whether a stress-based design is appropriate. As a result, the Panel cannot make an informed and reasonable assessment of the risks posed by the proposed project.

3.2.3 Corrosion Risk

824. NG has neither fully comprehended nor addressed the risk of corrosion.

3.2.3.1 Internal Corrosion Risk

825. Natural Resources Canada (NRCan) has confirmed the importance of understanding all mechanisms that could result in internal corrosion of the pipeline.

Dr. Santos (NRCan), Transcript Vol. 109, line 7077

826. PHMSA's Significant Incidents Listing website lists six Enbridge pipeline spills since 2004 which are due specifically to internal corrosion; the volume from these spills totaled 111,610 L.

Exhibit D80-27-03, p. 12

827. Studies undertaken by the Alberta Energy and Utilities Board (AEUB) in 2007 confirm that internal corrosion accounted for 49% of reported pipeline incidents in Alberta's hazardous liquid pipeline system. Further study by Sand *et al.* (2005) found that internal corrosion has accounted for 53% of all pipeline failures in Alberta between 1980 and 2002.

Exhibit D80-27-03, p. 11

828. Stress corrosion cracking can develop once sulphur has created a corrosive environment within a pipeline, storage tank or cargo hold, thereby increasing the risk of failure.

Exhibit D80-27-03, p. 2

829. NG has confirmed that the main issue that has been encountered in pipelines transporting products that are similar to diluted bitumen has been associated with under deposit corrosion. NG has also specifically identified under deposit corrosion mechanisms as the primary corrosive issue for the proposed pipeline.

Exhibit B75-2, p. 68
Exhibit B75-2, p. 70

830. NRCan evidence confirms that under deposit corrosion may be a potential issue for the proposed oil pipeline and NRCan has confirmed that water-wetted solid particles can cause under deposit corrosion.

Dr. Santos (NRCan), Transcript Vol. 110, lines 7788 and 7748

831. NRCan agrees that if there is significant reduction in near wall velocity there will be a possibility of increased buildup of deposits that may contribute to corrosion.

Dr. Santos (NRCan), Transcript Vol. 110, lines 7768-7769

832. NRCan and Enbridge have co-authored a paper on under deposit corrosion titled *Computational Fluid Dynamics Study of Solids Deposition in Heavy Oil Transmission Pipeline*. The study was referenced extensively in cross examination as an aid to cross examination by various interveners. This initial research has shown that near-wall velocity in heavy crude pipelines is reduced downstream of over-bends and this may result in increased solid deposition, which may contribute to corrosion.

Dr. Santos (NRCan), Transcript Vol. 110, lines 7744-7749 and 7765-7769

833. NRCan has confirmed agreement with the conclusions of the research that inertial forces can increase the thickness of the boundary layer at the pipe floor reducing the flow forces responsible for mobilizing solids resulting in corrosion occurring on the pipe floor downstream of over-bends. The research also noted that a crude oil pipeline where low

corrosion rates were indicated by conventional corrosion monitoring was subsequently found to have locally severe under-deposit pitting.

Dr. Santos (NRCan), Transcript Vol. 109, lines 6980-6987

834. Enbridge has observed that incidents of accumulation are strongly correlated to locations downstream of over-bends and NG has acknowledged that if solids are not carried away by flow they would deposit on the bottom of the pipe.

Dr. Santos (NRCan), Transcript Vol. 110, lines 7749-7754
Mr. Mihell, Transcript Vol. 86, lines 6761-6766

835. Enbridge has observed under deposit corrosion in their dilbit lines near over-bends, which are locations of low fluid shear stress (low fluid flow pressure).

Exhibit B50-2, p. 21

836. Despite the *Northern Gateway Pipeline Threat Assessment* recommendation that special attention should be focused on segments of pipe where accumulation could happen, for example at dead legs, and measures should be taken to avoid such features during the design phase, NG has confirmed that there will be numerous over-bends in the pipeline.

Exhibit B75-2, p. 70
Mr. Mihell, Transcript Vol. 86, line 6792

837. When assessing the risk associated with sediment deposition in the SQRA, NG found that flow velocities lower than 1.2 meters per second are associated with accelerated deposition of solid particles.

Exhibit 75-2, p. 68

838. During questioning, NG was unwilling to confirm that at no time or place along the operating pipeline would flow drop to 1.2 meters per second or less. NG noted that there would be variation across the cross-section of the pipeline and explained that the numbers used in the Semi-Quantitative Risk Analysis were based on bulk velocities.

Mr. Mihell, Transcript Vol. 86, lines 6764 and 6773-6775

839. NG asserts that the basic sediment and water content for the pipeline will be a maximum of 0.5 percent and that the operation of the pipeline in a fully-turbulent mode will result in full entrainment. Based on those operating conditions, NG has concluded that no significant internal corrosion is anticipated and the failure probability for the threat of internal corrosion is negligible.

Mr. Mihell, Transcript Vol. 86, line 6677
Exhibit B196-2, p. 19

840. However, NG has also noted that various other operating parameters may contribute to risk of solids settling including laminar flow as well as the type and viscosity of the products. NG has confirmed that the failure to entrain sediment in a fully turbulent flow presents a risk.

Mr. Mihell, Transcript Vol. 86, lines 6755-6757

841. NRCan has confirmed that the velocity profiles assessed in the *Computational Fluid Dynamics Study of Solids Deposition in Heavy Oil Transmission Pipeline* paper prepared by NRCan and Enbridge could lead to deposition of solids at the pipe wall with base sediments and water content of 0.5 percent.

Dr. Santos (NRCan), Transcript Vol. 109, lines 7060-7063

842. NG contests the applicability of *Computational Fluid Dynamics Study of Solids Deposition in Heavy Oil Transmission Pipeline* study based on the differences in diameter between the pipeline referenced in the study and the proposed pipeline. NG prefers instead to rely on data from an analog pipeline, Enbridge Line 4.

Mr. Mihell, Transcript Vol. 86, lines 6850-6857

843. Neither NG nor Enbridge have experience operating a pipeline in the terrain similar to the Kitimat River Valley.

Mr. Underhill, Transcript Vol. 96, line 20024

844. The reliability parameters of corrosion identified in the *Northern Gateway Pipeline Threat Assessment* make no mention of design features relating specifically to fluid dynamics and solid deposition.

Exhibit B75-2, p. 53

845. Enbridge Line 4 is located in part of Canada which has distinct topographic and geographic features which differ considerably from the proposed pipeline route. There are no mountains or rivers comparable to those present in the Kitimat River area. The value of Line 4 as an analogue for the assessment of fluid dynamics and solid deposition is of very limited value given the distinctive features of the pipeline routes. NG has filed no evidence relating to the design specifications of Line 4 pertaining to over-bends, dead legs or other such design features where fluid dynamics may be affected by the pipeline design. Further, despite having information regarding the design features of Line 4 readily available, NG has not provided a comparative analysis of the potential for sediment accumulation between the proposed pipeline and Line 4. Line 4 should be regarded by the Joint Review Panel as a poor analogue for the assessment of fluid dynamics and solid deposition. NG has chosen not to conduct reliable assessments of fluid dynamics and solid deposition and as a result the safety of the pipeline is in question.

846. NG is also dismissive of the research conducted by Enbridge and NRCan noting that "you can find a paper that will build any thesis that you want".

Mr. Mihell, Transcript Vol. 86, lines 6850-6857

847. NRCan offers a much more prudent and serious consideration of the *Computational Fluid Dynamics Study of Solids Deposition in Heavy Oil Transmission Pipeline* study suggesting that the next phase of research going forward would be to validate the research relating to under deposits of water-wetted solid particles in over-bends in a pipeline.

Dr. Santos (NRCan), Transcript Vol. 109, lines 6995-6997

848. The failure to validate the research conducted by NRCan and Enbridge and assess its applicability in relation to the specific design features of the proposed pipeline favours expedience over safety. Without that information NG is asking the Joint Review Panel to assess these risks in an evidentiary vacuum.

3.2.3.2 Microbial Corrosion

849. NRCan evaluated the potential risks associated with microbial corrosion when assessing the NG application and NRCan has confirmed that microbial corrosion is a potential mechanism presenting internal corrosion risk in the operation of pipelines transporting crude oils or crude oil derived products.

Dr. Santos (NRCan), Transcript Vol. 110, lines 7815-7819

850. The evidence of NG establishes that under-deposit corrosion can be enhanced if microbially-induced corrosion is expected.

Exhibit 75-2, p. 68

851. NRCan has also confirmed that the 2006 Prudhoe Bay, Alaska pipeline rupture was caused by internal corrosion due to microbial bacteria resulting from one area of the pipe bottom having completely corroded from internal microbial activity.

Dr. Santos (NRCan), Transcript Vol. 110, lines 7820-7823

852. The 2006 Prudhoe Bay, Alaska oil pipeline rupture resulted in a spill of 803,460 litres of crude oil.

Exhibit D80-27-3, p. 12

853. Inspection of the pipeline after the rupture "showed evidence of high rates of corrosion, even in places that has been free of corrosion in the fall 2005 inspection". The absence of corrosion from the inspection one year earlier may indicate rapidly occurring corrosive effect or potential limitations in inspection methods.

Exhibit D80-27-3, p. 12

854. NG has acknowledged that under deposit corrosion and microbiological activity can be a problem at the temperatures being proposed for pipeline operation should deposition of solids occur and NG has confirmed that flow conditions should be monitored for microbially-induced corrosion.

Exhibit 75-2, p. 70

855. Whether occurring independently or in concert with other corrosion mechanisms, microbial corrosion presents a risk for this pipeline and has resulted in serious consequences for other pipelines.

3.2.3.3 Sulphur

856. The level of corrosiveness of hydrocarbons is primarily dependent upon the contaminant concentration in petroleum products. Bitumen and diluted bitumen have higher levels of sulphur, heavy metals, TANs and asphaltenes than conventional crude oil.

Exhibit D80-27-03, p. 2

857. Sulphur can increase corrosion in many ways. First, it can break down the protective iron sulphide layers. Second, it can enhance cathodic reactions (polysulphides can consume electrons and can also directly consume electrons via solid state reactions). Third, elemental sulphur also acts as a suspended solid, impairing inhibitor performance by either reacting with inhibitor molecules or by blocking inhibitor adsorption onto the metal surface.

Exhibit B75-2, p. 69

858. NG has tacitly acknowledged that for diluted bitumen operations sulphur represents a problem if there is sedimentation of solids and sulphur.

Exhibit B75-2, p. 69

859. NG evidence establishes that sulphur content in the pipeline will reach as high as 5.3 weight percent under normal operating conditions.

Exhibit B101-2, p. 33

860. NG claims that sulphur percentage in the diluted bitumen to be transported on the proposed project is not higher in comparison with other heavy crude oils.

Exhibit B75-2, p. 69

861. However, assessments provided by NG of the properties of various conventional crudes and diluted bitumens in Western Alberta illustrating acidity and sulphur content display that all of the heavy sour crudes assessed had lower sulphur content than 5.3 weight percent, most displaying sulphur content less than half of the upper end of the sulphur content for the product to be transported by NG.

Exhibit B50-2, p. 11 (Figure 1a)

862. Even the average operating content of 2.7 weight percent, as described by NG, would exceed the sulphur content of the heavy sour crudes assessed in the evidence of NG relating to conventional crudes and diluted bitumens in Western Alberta.

Exhibit B1-5, p. 38
Exhibit B50-2, p. 11 (Figure 1a)

863. The evidence available in the record demonstrates that under deposit corrosion presents a safety risk for the pipeline. Scientific research completed collaboratively by NRCan and Enbridge has concluded that transmission quality heavy crude oil carries water-wetted solid particles which can accumulate on the pipe floor and cause under deposit corrosion and that the incidence of accumulation is strongly correlated to locations downstream of

over bends. NG has asserted that the failure probability associated with internal corrosion is negligible because the pipeline will operate in a fully-turbulent mode. However, the pipeline will have many over-bends and other design features where flow velocity could be reduced.

864. NG has applied a bulk velocity average to assess the risk associated with under deposit corrosion but has failed to account for those portions of the pipeline where flow velocities may drop below 1.2 meters per second. NG's own evidence provides that where flow velocities drop below 1.2 meters per second it may result in accelerated deposits of solid particles. NG expert witnesses would not confirm during questioning that flow velocities would never drop below 1.2 meters per second. Further, NRCan has confirmed that even at base sediment and water content levels of 0.5 percent it is still possible for deposition of solids to occur at the pipe wall.

865. NG has used Line 4 as an analogue but failed to account for differences in design features which may affect fluid dynamics and solid deposition. A comparative assessment of those design features is essential to the reliability of the NG evidence and the failure to provide that information calls into question the NG conclusions relating to internal corrosion risk and the associated mitigation measures.

866. NG has used average bulk flow rates to assess risk but they are not reflective of localized risk associated with reductions in flow velocity causing under deposit corrosion in areas where flow is reduced due to over bends and other design features. The failure to account for those localized risks calls into question the reliability of the NG assessment and generates considerable uncertainty regarding the safety of pipeline operations. Scientific research completed collaboratively by NRCan and Enbridge has identified risks associated with under deposit corrosion downstream of over-bends and NG has failed to account for those risks in pipeline design. Absent further technical assessment of the internal corrosion risk associated with under deposit corrosion and identification of appropriate mitigation measures based on those studies, the risks associated with the proposed pipeline design remain unknown and safety cannot be assured.

3.2.3.4 External Corrosion Risk

867. A system-wide threat assessment review for Enbridge in 2011 following the big spill in Kalamazoo found that based on Enbridge's 1984–2010 leak report database external corrosion had caused 14% of the past failures.

Exhibit D80-69-3, p. 75

868. External corrosion was a primary cause of pipeline failure on pipeline operated by Enbridge as recently as July 2010. The NTSB concluded that the big spill in Kalamazoo was due to corrosion fatigue cracks that grew and coalesced from multiple stress corrosion cracks, which had initiated in areas of external corrosion. The resultant failure released an estimated 843,444 gallons of crude oil into surrounding wetlands and waterways.

Exhibit D80-69-3, p. 123
Exhibit D80-69-3, p. 37

869. NRCan has confirmed that microbial corrosion can present an external corrosion risk when microbes in soil attack the steel at coating holidays.

Dr. Santos (NRCan), Transcript Vol. 110, line 7825

870. NG evidence tacitly acknowledges that, in instances where coatings have failed and the cathodic protection is not fully protecting the pipe, corrosive environments may result in metal loss.

Mr. Kresic, Transcript Vol. 99, line 23637

871. NRCan has noted that if sporadic or mountain permafrost were to be encountered along the pipeline route then pipeline design parameters would have to be changed to ensure control of external corrosion. NRCan sought further information from NG concerning the measures which would be taken to address the effects of sporadic or mountain permafrost. NG responded by informing NRCan that no significant permafrost had been identified along the pipeline route at the time the response was prepared.

Exhibit B41-4, p. 6

872. During questioning, NRCan confirmed that the NG's response did not preclude the possibility that significant permafrost could be identified at a later date, following further investigations. NRCan also confirmed that NG did not provide an explanation of what it meant when it used the term *"significant"* to qualify its assessment of the presence of sporadic or mountain permafrost along the pipeline route.

Mr. Clarke (NRCan), Transcript Vol. 110, lines 7653-7657

873. In response to questioning from the Province of British Columbia concerning the NG evidence that no significant alpine permafrost has been identified, NG confirmed that investigations had not yet been completed.

Mr. Cavers, Transcript Vol. 85, line 5737

874. The potential for undiscovered coating holidays and interruptions in the cathodic protection system present external corrosion risks for the safe operation of the pipeline. Coating holidays can occur as a result of various deficiencies. Human error can contribute to the presence of coating holidays during construction. Soil settling and rocks in the pipeline trench may also contribute to coating holidays. Very small interruptions in protective coating are sufficient to permit corrosion to occur. All corrosion requires is a small direct path between metal and soil. Where corrosion is present there is a heightened risk of pipeline failure. Initial determinations relating to the presence of permafrost are subject to change and, if present, permafrost may impair the reliability of the cathodic protection system. External corrosion risk remains a significant concern in relation to Enbridge pipeline operations. Many of Enbridge's past failures have resulted from external corrosion.

875. NG has failed to fully consider the risks associated with internal and external corrosion.

3.2.4 Failures in Leak Detection

876. NG's SQRA is premised on an assumed worst-case scenario of a full bore rupture with an emergency shutdown occurring within 13 minutes, based on detection and verification taking 10 minutes and emergency shutdown taking 3 minutes.

Mr. Callele, Transcript Vol. 86, lines 6073-6075
Mr. Baumgartner, Transcript Vol. 92, lines 14790-14791 and 14816

877. Enbridge's recent spill of 3,750,000 litres of diluted bitumen into the Kalamazoo River at Marshall Michigan has demonstrated clearly that even with remote leak detection, human error can result in delays in response. NG has stated it will investigate the possibility of programming for automatic shutdowns at the SCADA level, but has failed to provide any additional evidence regarding the progress of this investigation.

Exhibit B132-2, p. 138, Response to Haisla Nation IR No. 4.87
Mr. Callele, Transcript Vol. 92, lines 14831-14833
Mr. Callele, Transcript Vol. 96, lines 19548-19553

878. NG has demonstrated a reluctance to plan for a spill greater than a full bore rupture with a 13-minute shutdown – even though it knows all too well that a far more serious spill is possible even with remote detection.

Mr. Doering, Transcript Vol. 88, lines 8628-8629
Mr. Baumgartner and Mr. Underhill, Transcript Vol. 96, lines 19390-19437

879. The 3,750,000 litre spill of diluted bitumen from Enbridge's line 6B has demonstrated the reality that human error can result in delays in response that mean the "worst-case" scenarios modeled by NG are not even **remotely** close true worst-case scenarios. Regulators in the United States, who described Enbridge's handling of their Kalamazoo bitumen spill as being akin to that of the "Keystone Cops", have found that Enbridge had not developed adequate response plans for a worst-case spill, on the basis that far more oil was spilled into the Kalamazoo River than had been planned for.

Exhibit B92-3, p. 127
Mr. Baumgartner, Transcript Vol. 96, lines 19388-19404

880. Absent the detection of leaks through technology, pipeline operators rely on visual and olfactory signs of leaks. Human detection methods are only effective to the extent someone is present to see or smell the spilled oil. The upper portions of the Kitimat River Valley are remote and devoid of habitations (like most of the pipeline which is described in the ESA for the assessment of noise impacts as in "remote and sparsely populated areas").

Exhibit B3-2, p. 20

881. Most pipeline spills are not discovered as a result of remote leak detection technology. Only 5 of 11 Enbridge spills of greater than 1,000 barrels that occurred between 2002 and 2012 were detected as a result of remote leak detection technology. Human observation is a method commonly relied on for leak detection. Human observation is what eventually caused Enbridge to realize it had a leak on its hands at Kalamazoo, 17 hours after it

started. The first human observation of the leak, however, did not occur until 3.5 hours after the rupture.

Mr. Callele, Transcript Vol. 97, lines 20416-20419
Mr. Callele, Transcript Vol. 82, lines 5908-5912
Exhibit B93-2, p. 18

882. Over-flights of the pipeline ROW will be intermittent, and are anticipated to take place about once every two weeks, with the potential for weather to cause delays that result in an even longer time between over-flights.

Exhibit B45-8, p. 12
Mr. Callele, Transcript Vol. 86, lines 5911
Mr. McHugh, Transcript Vol. 146, lines 19305-19308

883. It is unrealistic to rely on human observation for the detection of leaks in the upper Kitimat River Valley. Yet, current remote leak detection technology suffers from a number of shortcomings:

- The expected performance for theoretical leak detectability for a two-hour alarm is 1.5 to 3%. A leak of 1.5% that goes undetected over the course of 24 hours could result in 7,875 barrels (or 1,252,025 L) of oil or 2,895 barrels (460,268 L) of condensate being spilled without it being detected through remote leak detection technology.

  Exhibit B44-2, p. 2
  Mr. Doering, Transcript Vol. 146, line 19312

- At the time of the Kalamazoo spill, the SCADA system was resulting in a significant number of false alarms that had to be distinguished from legitimate ones. This can lead to a tendency to dismiss warning indicators. NG has stated that this situation will be remedied by the time the proposed pipelines become operational, but has not filed any evidence of taking steps in that direction. Again, NG is offering intentions and pleasant words in place of an actual plan and evidence.

  Mr. Callele, Transcript Vol. 92 , lines 14744-14746

- Column separation can look similar to a leak and a leak event can assumed to be a column separation event, as happened with the Kalamazoo spill. Column separation degrades both the sensitivity and the reliability of the monitoring system (CPM). This can result in no alarm when there is in fact a leak, or triggering an alarm when there is no leak. For these reasons, it is difficult to distinguish between a leak and column separation during normal operations.

  Mr. Callele, Transcript Vol. 97, line 20425
  Exhibit B43-10, p.22, Response to J. Weir IR Nos. 5-16a) and c)

884. Neither NG nor Enbridge have experience operating a pipeline in the terrain similar to the Kitimat River Valley. Remote leak detection technology results in the enunciation of abnormal operating conditions, which required human action in response. The mountainous terrain that the proposed pipeline will pass through may result in increased

propensity for the enunciation of abnormal operating conditions, which can delay timely response. NG has not demonstrated that it is prepared for this.

Transcript Vol. 96, line 20024
Mr. Callele, Vol. 96, lines 19514-19518

885. NG has committed to designing and operating the proposed pipelines in a way that prevents column separation from occurring, and in its proposed potential conditions the Panel has proposed a condition that requires NG to develop and file operating procedures that require operating the pipelines in a manner that prevents column separation. Even if the possibility of column separation is completely eliminated from the proposed pipelines, this will not eliminate all the concerns regarding reliability of remote leak detection.

Exhibit A346, Potential Conditions 151-152

886. NG has made reference to the potential use of technology that can detect oil in water, but has limited its commitment to "to try to find the appropriate places for such technology". NG has also made reference to vapour tubes, but again is in the process of exploring suitability and has not committed to using vapour tubes on the proposed project.

Mr. Callele, Transcript Vol. 92, line 14688
Mr. Callele, Transcript Vol. 86, lines 6012-6235

887. NG has proposed complementary remote leak detection for the pipeline and has commenced investigating systems, but has not provided any details about what that system would be. Further, NG will not be able to demonstrate until construction is complete what its actual capabilities are.

Mr. Callele, Transcript Vol. 86, lines 6046-6049

888. The Panel has proposed a potential condition for the project that NG file a report on its proposed complementary leak detection, detailing how and why it was selected, and a timetable for installing and implementing it.

Exhibit A346, proposed conditions 112- 113

889. Given NG's evidence that it will not be able to determine the actual capabilities of a complementary leak detection system, this proposed condition as stated does not provide the assurance that is required. The proposed condition should be strengthened to require NG to demonstrate a target threshold for leak detection and complementation.

890. Pipeline spills occur and the degree and extent of the effects of those spills are exacerbated if the spills are not detected in a timely way. In remote areas like the Kitimat River Valley it is unrealistic to expect a spill to be immediately detected through human observation. Therefore effective remote leak detection will be critical. Current remote leak detection technology suffers from a number of serious shortcomings and NG has not demonstrated that these shortcomings can be overcome.

3.2.5 Pipeline Operator's Track Record

891. The risk of an accident or malfunction cannot be considered in isolation of the identity of the owner/operator of the pipeline and the track record that entity has with respect to pipeline operations. Although Northern Gateway Pipelines Inc. is a new entity being created solely for the purpose of the proposed project, NG's evidence makes it clear that the pipeline will be operated under the aegis of Enbridge's pipeline system, and that Enbridge will be guiding spill response.

Mr. Callele, Transcript Vol. 86, line 6170
Mr. Underhill, Transcript Vol. 92, lines 13893-13895 and Transcript Vol. 95, lines 17522-17533
Mr. McHugh, Transcript Vol. 147, line 19834

892. Enbridge's track record for pipeline operations has been plagued by recent incidents. The most significant of these is the spill of 3,750,000 liters of diluted bitumen into the Kalamazoo River at Marshall, Michigan. The NTSB Report into the Kalamazoo spill identified numerous and specific failures on Enbridge's part, including:

- Enbridge's interpretation of applicable regulations delayed the repair of the pipeline;
- Enbridge's integrity management program was inadequate because it failed to consider, *inter alia*, a sufficient margin of safety, appropriate wall thickness, tool tolerances, effects of corrosion on crack depth sizing, accelerated crack growth due to corrosion fatigue;
- Enbridge's control centre was poorly trained and managed and had developed a culture of deviance;
- Enbridge failed to implement effective oil containment measures for fast-flowing waters;
- Enbridge did not have sufficient resources available to respond to a spill;

Exhibit B93-2, pp. 132-135

893. With respect to the cause of accident, the NTSB found:

> "The rupture and prolonged release were made possible by pervasive organizational failures at Enbridge Incorporated (Enbridge) that included the following:
>
> - Deficient integrity management procedures, which allowed well-documented crack defects in corroded areas to propagate until the pipeline failed.
> - Inadequate training of control center personnel, which allowed the rupture to remain undetected for 17 hours and through two startups of the pipeline.
> - Insufficient public awareness and education, which allowed the release to continue for nearly 14 hours after the first notification of an odor to local emergency response agencies."

Exhibit B92-3, p. 136

894. Enbridge continues to subject to cleanup orders for the spill of 3,750,000 liters of diluted bitumen in to the Kalamazoo River in Marshall Michigan. On March 14, 2013, almost three years after the spill, the US EPA issued an order requiring Enbridge to conduct additional containment and dredging as part of ongoing oil cleanup requirements.

Mr. Underhill, Transcript Vol. 91, lines 13426-13427
United States EPA Region 5, Order for Removal under Section 311(c) of the Clean Water Act, Docket No. CWA 1321-5-13-001

895. Enbridge has also experienced four recent "crude oil releases" on Line 21, which had a previous crude oil release in May of 2011. The NEB has issued an Amending Order requiring an additional engineering assessment.

Letter dated March 22, 2013 from NEB to Mr. Monaco, File OF-Surv-Inc-2001 74 01 and Amending Order AO-0020SO-E102-00202011

896. In addition, Enbridge's Emergency Shut Down systems and pump station power supplies continue to be in a state of non-compliance since October of 2011. This affects over 125 facilities. The NEB has had to impose an order on Enbridge to submit a corrective action plan.

Letter dated March 15, 2013 from NEB to Mr. Monaco, File OF-Surv-Fins-E1010 2011 and Order SO-E101-2013
Letter dated May 2, 2013 from NEB to Mr. Monaco, File File OF-Surv-Fins-E1010 2011

897. Despite the proposed project not technically being an Enbridge pipeline, NG has stated clearly that it will be operated as part of the Enbridge pipeline system. The extent of Enbridge's non-compliance, the continuing inability or unwillingness of Enbridge to ensure its pipelines and facilities comply with the regulations governing them, and the slow implementation of corrective actions raises serious concerns about how the proposed pipelines will be operated and maintained.

3.2.6 NG's Risk Levels Are Not Consistent with the Public Interest

898. NG's application failed to set out clearly the likelihood of a spill from the proposed project. As a result of oral questioning, it has become clear, however, that there is an 18.2% chance of a tanker spill of any size (non-zero) over a 50-year period and there is an 18.8% chance of a pipeline rupture and there is a 56.2% chance of a spill of any size at the terminal. The probability of a spill event is thus 70.7% over 50 years.

Mr. Ruitenbeck, Transcript Vol. 78, lines 25714-26012, particularly line 26011

899. The 18.8% chance of a pipeline rupture admitted to by NG is obviously of great concern to the Haisla Nation. A pipeline rupture does not have the possibility of being a very small spill. NG's target volume for rupture releases between block valves for the Kitimat River Valley is to try to keep it to below 2000m^3 (based on a 13-minute shutdown).

900. NG is not able to identify an acceptable risk level for the pipelines. There is an inherent tension between risk and cost. NG's approach is to examine risk and seek to reduce it to a level of diminishing returns. Inherent in that assessment of diminishing returns is a cost factor.

Mr. Mihell, Transcript Vol. 87, lines 7872-7879

901. The diminishing returns concept is illustrated by NG's evidence relating to third party threats:

> **7743.** So I think on the basis of the empirical evidence alone would suggest that, as far as third-party damage resistance is concerned, I think we've achieved a certain level of diminishing returns with respect to that potential threat.
> …
> **7760.** And, ultimately -- I guess the reason why I threw out the example initially of third-party damage is that it did a good job of illustrating the concept that, as we -- if we were to contemplate further increases in wall thickness, neither the models nor the empirical evidence would suggest that you would accrue great benefit in terms of risk reduction from the perspective of third-party damage.

Mr. Mihell, Transcript Vol. 87, lines 7743-7760

902. Through this evidence, NG suggested that third party damage resistance had been mitigated to the best level achievable. Later questioning about the revised SQRA, however, showed that further mitigation was not only possible but had been implemented, to the extent that third party damage had been "eliminated" as a threat:

> **19128**. I do just want to add a little bit to Mr. Cavers' description earlier. Based on the revised SQRA, which we recently filed -- and I think we were looking here at the original SQRA -- you will recall that we made some commitments to enhanced or increased pipe wall thickness.
> **19129**. The pipe wall thickness now ranges from between 20 and 22 millimetre wall thickness on the oil pipeline. I'll just focus on the oil pipeline for a moment.
> **19130**. And we know from our data in undertaking the SQRA that North American and European data shows that third-party contact with pipelines above 15 to 16 millimetre wall thickness will not be a hazard for this pipeline.
> **19131**. So when in the original SQRA we assigned an elevated risk level associated with third-party contact damage, we have since eliminated that because of our commitment to go to higher wall thickness pipe through this area and others, and that has really eliminated this, to a large extent, as a concern.

Mr. Doering, Transcript Vol. 146, lines 19128-19131

903. This clearly demonstrates the economic and design choices NG is making with respect to risk, mitigation and elimination of risk.

904. NG has identified risks associated with the pipeline, has determined unmitigated risk and then, through the application of design changes etc., has arrived at mitigated risk levels. The fact that the mitigated risk levels are lower than the unmitigated levels does not mean, however, that the risk is at an acceptable level. NG has been unwilling to identify whether it has determined an acceptable risk level and what it is, and has instead framed risk mitigation in terms of context based on available technology and procedures, and what is reasonably practicable given diminishing returns.

Exhibit B132-2, p. 121
Mr. Doering, Transcript Vol. 87, line 7797
Mr. Mihell, Transcript Vol. 87, lines 7736-7738

905. NG has elaborated on the concept of diminishing returns by stating that it is a point that is reached when undertaking additional risk mitigation measures is disproportionately resource intensive compared to the amount of risk mitigation benefits that might accrue. NG has acknowledged that cost is a factor, but that "other resources" are as well, without identifying what these other resources might be. NG has also stated that determining what is reasonably practicable requires some subjectivity, some engineering judgment, and some evaluation. Finally, NG has stated that it is the responsibility of the proponent to determine levels of risk and to identify opportunities for risk mitigation.

Mr. Mihell, Transcript Vol. 87, lines 7736-7738, 7755 and 7761
Mr. Doering, Transcript Vol. 87, line 7766

906. NG acknowledges that as a corporation it has obligations to its shareholders, with the caveat that since it is a regulated entity it also has obligations to customers and shippers as well as other stakeholders, and with the further caveat that this includes suppliers. NG failed to make any references to obligations to the Haisla Nation or to any other Aboriginal occupants of the lands and waters it proposes to use for the project.

Ms. Holder, Transcript Vol. 153, line 22756
Mr. Carruthers, Transcript Vol. 153, line 22757

907. NG has not asked the Haisla Nation whether there this is an acceptable level of risk for a spill into the Kitimat River valley.

Ms. Holder, Transcript Vol. 153, line 27777

908. Nor is NG sensitive to the public's risk level comfort. NG is adamant that it is not seeking a social licence with respect to risk:

> **7879.** … It's not to try to claim social license. To try to generate a number that society's going to say "I can live with that", that's not what we're trying to do here.

Mr. Mihell, Transcript Vol. 87, lines 7875 and 7878-7879

909. Instead, NG is determining what level of risk it can live with, while being acutely aware of the costs to the bottom line of doing more. This is contrary to sensible design:

> **5640.** …You choose a risk level what makes sense. What makes sense to all the stakeholders, and then you select a design criterion to meet the risk, that particular risk level.
>
> *Dr. Malhotra, Transcript Vol. 109, line 5640*

910. NG is responding to risk reduction drivers and considerations that are not aligned with the Haisla Nation's interests or with the public interest. As a corporation beholden to its shareholders, NG must operate in the manner that generates the most profit for those shareholders. While NG's private pecuniary interests require ensuring it is not exposed to risks that will unduly impair that profit, it does not require ensuring that the lands, water, and resources of Haisla Nation Territory are used in a manner that is consistent with Haisla Nation stewardship obligations.

911. NG's assessment of risk and application of mitigation is divorced from the risk comfort levels of the Haisla Nation and the Canadian public. The level of risk that NG deems to be as low as NG is willing to live with is not a level that aligns with the public interest.

912. **Finding Requested: The Panel should find that NG has not provided enough information to allow a reasonable assessment of the risk of a spill from the proposed pipeline.**

913. **Finding Requested: The Panel should find that NG has not adequately considered the factors that contribute to the risk of a spill from the proposed pipelines.**

3.3 NG is Understating Potential Effects of a Spill

914. A spill of oil from NG's proposed pipelines would have severe adverse effects on the lands, water, and resources of Haisla Nation Territory, would attack the very underpinning of Haisla Nation culture and Haisla Nation sustenance, and pose a health threat to the Haisla people. NG's application seeks to minimize the degree and extent of such effects by systematically underestimating risk and by overestimating ecological resilience.

915. Although an accident or malfunction from the pipeline could result in a number of potential spills, the Haisla Nation is most concerned about a pipeline spill that enters the Kitimat River and Kitimat Arm or results in a large spill in a populated area.

3.3.1 Effects of an Accident or Malfunction

916. A spill that enters the Kitimat River would almost certainly have immediate as well as long-term significant adverse effects on the environment, including mortality of fish and aquatic biota, chronic health impacts on fish and aquatic biota, adverse human health effects, and downstream effects well into the Kitimat River Estuary.

> Hydrocarbon spills could have immediate acute adverse effects, particularly in an aquatic environment, where fish, aquatic biota and birds that dwell on the water surface would be most affected. Hydrocarbons dissolved in water have an immediate toxic effect on aquatic organisms, and juvenile fish are more vulnerable than adults. Some chronic toxicity associated with any hydrocarbons might remain after cleanup, because PAH levels in sediment may remain above applicable guidelines for the protection of aquatic life until

> biodegradation has reduced the levels. Most wildlife groups would be affected to some degree by habitat loss, particularly those species with low mobility and small home ranges. Direct contact (e.g., smothering, coating of fur or feathers) and absorption, ingestion or inhalation of hydrocarbons can lead to mortality of vegetation and wildlife. Mechanisms of toxicity vary depending on the organism.
>
> *Exhibit B3-20, p. 68*

917. NG identified that there is the potential for significant and adverse effects on the biophysical environment and human uses (e.g., traditional use, other types of fishing, recreation) resulting from an oil spill. Depending on the spill conditions and the success of the response, effects could persist over the moderate to long-term.

> *Exhibit B164-13, p. 36*

918. NG has acknowledged that a spill has the potential to cause significant adverse effects on some biota and the ecosystems that support these species, which could in turn affect resources of importance to Aboriginal people or the ecosystems that support these resources:

> Depending on the biophysical setting (e.g., location, season of year, species present, weather conditions, sea conditions) and the magnitude and duration of a spill, there is potential for significant adverse effects to occur to some biota and the ecosystems that support these species. These effects on certain biota could, in turn, affect resources commonly understood to be of importance to Aboriginal peoples or the ecosystems that support these resources. The exact nature of these effects could differ widely as a result of many variables, as would the success of clean-up operations, habitat rehabilitation and species recovery.
>
> While there is potential for spills to result in significant adverse consequences on the biophysical environment, the probability of large spills is considered to be low and therefore any significant adverse effects is unlikely.
>
> *Exhibit B39-3, pp. 50-51, NG Response to Haisla Nation IR No. 1.14a)*

919. NG has also acknowledged that a spill of oil into a watercourse that flows into the marine environment, such as a tributary to the Kitimat River, has the potential to affect estuarine and marine vegetation. These effects include smothering or acute toxicity to eelgrass, uptake and accumulation of contaminants, or substrate disturbance. In addition, there could be indirect effects on species that use eelgrass habitat. Estimated recovery time can be up to 12 years. Contamination of intertidal sediments could lead to long-term release of contaminants, which may affect reproduction and recruitment and delay recovery of affected populations.

> *Exhibit B3-20, pp. 54-55*

920. In response to concerns expressed from the Haisla Nation and other intervenors, NG filed a report titled *Recovery of the Biophysical and Human Environment from Oil Spills* as part of

its reply evidence. The report identified average time to recovered status for the biophysical VECs examined and determined that 2.3 years were required for freshwater environments and 5.8 years for marine environments. Those timelines were later adjusted downwards by NG during cross examination to 2 years for freshwater VECs and 5 years for marine VECs.

Exhibit B83-17, p. 8
Dr. Pearson, Transcript Vol. 134, 1515-1516

921. The ongoing clean-up of diluted bitumen from the Kalamazoo River, almost three years after the spill, suggests that recovery times estimated on the basis of crude oil spills substantively underestimate times to recovery from spills of diluted bitumen. Further, the reliance on an average time span fails to portray the worst-case scenario, and does not represent a conservative approach. The assessment of potential effects must consider the potential for recovery based on the longest known recovery times.

922. The reliability of *Recovery of the Biophysical and Human Environment from Oil Spills* is addressed in more detail in paras. 1481 to 1515 in the context of impacts of spills to the marine environment. In the context of the pipelines, it is important to understand that the *Recovery of the Biophysical and Human Environment from Oil Spills* does not adequately address the concerns about long-term effects of a spill of oil or condensate into the Kitimat River. It relies on a malleable definition of recovery. Further, the literature which informed the report is uneven in its treatment of the specific species. It does not discuss eulachon, Chinook salmon or chum salmon, species of critical importance in the Kitimat River.

Exhibit B83-17, p. 24
Exhibit B204-1, NG Response to Undertaking U68

923. NG has acknowledged that a spill from the pipeline into the Kitimat River could affect residents of both Kitimat and Kitamaat Village, and could cause significant adverse effects to human health.

Exhibit B80-3, p. 125
Dr. Malcolm Stephenson, Transcript Vol. 148, line 21542
Dr. Dennis Yee, Transcript Vol. 148, lines 21730 and 22152

924. NG has acknowledged that a spill from the pipeline into the river could cause significant adverse effects to fish populations that might not be reversible:

Mr. Green, Transcript Vol. 99, lines 22830-22832 and Transcript Vol. 1, lines 18793-18796
Dr. Stephenson, Transcript Vol. 146, line 18970
Mr. Owen McHugh, Transcript Vol. 146, line 18994

925. NG's evidence shows that there are a minimum of 74 potential spill pathways from a pipeline spill that would result in the oil reaching the Kitimat River. The maps of potential spill trajectories for full bore ruptures show spill pathways for different locations on the pipeline, based on maximum full bore releases for each one km segment. While some of

the pathways are the same in the two maps, some are different. While these maps do not show **all** the potential pathways, they do, together, show **at least 74 pathways**.

Exhibit B20-24, p. 5
Exhibit B109-22

926. In reality, given the close proximity of the pipeline to the Kitimat River throughout its route through the Kitimat River Valley, almost any rupture of the pipeline in the Kitimat River Valley is likely to result in oil entering the river. In many instances, the oil would reach a watercourse within a very short time.

927. Oil that spills into the Kitimat River will weather, become entrained in the surface waters, attach to sediment and end up at the bottom of the Kitimat River. This submerged oil has the potential to find its way into interstitial gravels where salmon spawn.

Exhibit B80-3, p. 61
Transcript Vol. 96, lines 19265-19266
Dr. Stephenson, Transcript Vol. 93, lines 15963-15966

928. A spill of oil or condensate into the Kitimat River also has the potential to cause adverse human health effects from acute exposure. NG has acknowledged the safety concerns associated with condensate and the MSDS for condensate recommends staying upwind and away from a spill or release, notifying people downwind immediately, isolating the hazard area and keeping unauthorized personnel out, and wearing appropriate protective equipment including respiratory equipment as conditions warrant

Mr. Underhill and Dr. Stephenson, Transcript Vol. 97, lines 26016-20631
Exhibit B200-2, NGP Response to Undertaking U67

929. Acute inhalation risk may occur following the release in the immediate vicinity of an oil plume. For the Kitimat River spills, the *EHHRA* refers to voluntary evacuations and states that hazard quotients may dictate closing the area to public access and advising people in the immediate vicinity of the river to leave the area, pending establishment of an ambient air monitoring program to determine when air quality has returned to levels that are not harmful to human health.

Exhibit B80-2, p. 4
Exhibit B80-3, p. 152

930. Members of the Haisla Nation live on Kitamaat IR No. 2 and in Kitimat itself, and are therefore at risk of exposure to spilled oil or condensate. As will be set out below, NG has not done enough to ensure members of the Haisla Nation or the public will be protected from such effects.

3.3.2 Toxicological Impacts not Properly Assessed

931. NG has not conducted a comprehensive analysis of the potential toxicological impacts of a release of diluted bitumen or condensate into the Kitimat River. NG's *EHHRA* attempts to model a spill of 1,293m^3 of diluted bitumen or synthetic oil and 974m^3 of condensate into

the Kitimat River at Hunter Creek, approximately 65 km upstream of the Kitimat River Estuary.

Exhibits B80-2 to B80-11

932. The *EHHRA* is reliable to confirm that a spill of oil into the Kitimat River will result in acute toxicological effects, that the oil will become stranded on the shoreline, submerge and sink into the sediments, and that the oil will reach the Kitimat River Estuary. It cannot, however, be relied on to conclude that there will be no chronic toxic effects.

Exhibit B80-3, p. 61

3.3.2.1 Modelling not Reliable

933. The *EHHRA* relies on river modelling to assess the extent to which an unmitigated full bore rupture poses a threat to the environment. The modelling for the *EHHRA* relied on weathering information provided by SL Ross. The weathering modelling that was conducted by SL Ross has been described by Environment Canada as unrealistic (see paras. 1255 to 1259, below). If the weathering input assumptions into the *EHHRA* modelling are unrealistic, then it is likely the output will also be unrealistic.

Mr. Underhill and Mr. Milne, Transcript Vol. 96, lines 19361-19370

934. The model used in the *EHHRA* is SIMAP, a model developed for marine and estuarine areas. Although SIMAP has been used in the United States for conducting Natural Resources Damages Assessments for rivers, NG could not confirm that it has been validated for use in river environments, particularly those that are shallow and fast flowing, such as the Kitimat River.

Dr. Horn, Transcript Vol. 147, lines 19687-19692
Dr. Hodson, Transcript Vol. 164, lines 11087-11090 and 11101-11114

935. The *EHHRA* hydrodynamic model was run in steady-state as opposed to dynamic mode. In other words, the model was run with conditions that did not change with time. In the Kitimat River, conditions can change rapidly as a result of meteorological events. Adopting a steady-state approach for modelling in the Kitimat River is inadequate and results in an unreliable model.

Exhibit B80-4, p. 72

936. NG has stated that the BFHYDRO model used to support the EHHRA was applied in three dimensions (3D). However, NG states:

> The set of governing equations with dependent and independent variables transformed from spherical to curvilinear coordinates, in concert with the boundary conditions, is solved by a semi-implicit, split-mode finite difference procedure (Swanson, 1986). The *equations of motion are vertically integrated* and, through simple algebraic manipulation, are recast in terms of a single Helmholtz equation in surface elevation. This equation is solved using a sparse matrix solution technique to predict the spatial distribution of surface

> elevation for each grid. *The vertically averaged velocity is then determined explicitly using the momentum equation*.
>
> *Exhibit B80-4, p. 84*

937. The emphasized portion of the above text is the scientific way of saying that the 2D version of the model was in fact used, and not the 3D version. The model would have been far more valuable to predict Kitimat River flow patterns if three dimensions were used, instead of only two.

> *Dr. Horn, Transcript Vol. 146, lines 19424 and 19465*

938. Environment Canada acknowledges the importance of calibrating laboratory results to real world spills. This applies equally to modelling. NG and Enbridge had the ample opportunity to ground-truth the SIMAP modelling relied on in its *EHHRA* by modelling what ought to have happened in the Kalamazoo River after the spill of 3,750,000 liters of oil, in comparison to what actually happened. NG and Enbridge have not done that and have not considered doing that, thereby missing out on an opportunity to demonstrate the suitability and reliability of the modelling done for the *EHHRA*. Without such validation, the suitability of the SIMAP model for a river such as the Kitimat River remains highly doubtful.

> *Dr. Hollebone (EC), Transcript Vol. 167, line 17271*
> *Mr. Anderson, Transcript Vol. 147, lines 19694-19702*

939. The modelling used for the *EHHRA* is based on flow rates that are calculated from discharge measurements at one location on the Kitimat River. This is discussed in greater detail in paras. 795 to 800 above.

940. Topographically induced hyporheic flow can be generated by stream-bed irregularities such as gravel pools and riffles, which are found in the Kitimat River. The SIMAP model used for the *EHHRA* did not consider the potential for hyporheic flow during the acute phase of the model.

> *Dr. Horn, Transcript Vol. 146, lines 19473-19484*

941. Oil droplets entrained into the water column through turbulence can also be entrained into the bed sediments by hyporheic flows. As a result, it is not just dissolved materials from oil that can get into the sediment, it's the actual free-phase oil itself, resulting in an ideal medium for desorbing the toxic components of oil from their very high concentration in the free-phase oil into the waters in the bed sediments themselves. Fish will literally choose areas of the river for spawning where there are extensive hyporheic flows because these flows provide the oxygenation necessary to keep their eggs healthy and alive. As a result, hyporheic flow can act to concentrate oils into the very areas selected by fish for spawning, and thus increasing the potential for toxicity to embryos and for reduced recruitment.

> *Dr. Hodson, Transcript Vol. 164, lines 11304-11306*

942. NG has acknowledged this concern in its reply evidence, but has sought to dismiss the effects of the deposition of oil into spawning beds on the basis of its modelling and chronic toxicity assessment. NG has suggested that the most likely outcome of a major spill that resulted in oil becoming deposited in spawning gravel is that a single year-class of fish could be lost, but that recovery would occur in subsequent years. As will be demonstrated below, NG's chronic toxicity assessment suffers from significant flaws which undermine its reliability, thereby also undermining NG's assessment of the degree and extent of effects of oil deposition into spawning beds.

Exhibit B80-3, p. 115

943. The argument that the loss rate of oil from river sediments is predicted by the loss rate of oil from laboratory columns of oiled gravel is over-simplified and assumes that conditions in river sediments are identical to those in the laboratory. The loss rate of oil from sediment deposits will be a function of the surface area of oil exposed to water and the flow rate of that water, which will vary with discharge rates of the stream and the changing pressure gradients and resultant hyporheic flows. However, the time needed to deplete oil from sediments to concentrations below those associated with toxicity will be a function of how much oil was deposited in the sediments during a spill. Laboratory gravel columns are charged with a finite amount of oil, distributed evenly by mixing the oil into the gravel.

Exhibit D80-27-5, pp. 27-29

944. In a spawning bed, the oil will be distributed unevenly, according to flow patterns or distributions within the spawning bed, and concentrations of free phase oil in droplets entrained from surface waters. If oil accumulates unevenly in large pools or droplets, depletion rates may be much longer than in the laboratory, because the mass of oil is large and the loss rate is limited by the low water solubility of the constituents of oil. As set out in the *Technical Data Report – Toxicity of Oil to Fish* by Dr. Hodson, Dr. Collier and Mr. Martin, heavy oil in sediments can persist for more than 25 years at concentrations high enough to still be toxic to aquatic biota. Disturbance of these deposits of oil can release liquid or free-phase oil back into interstitial waters.

Exhibit D80-27-5, p. 24

945. In the context of spill response, NG has acknowledged that depositional areas will occur. NG has provided contradictory evidence on the suitability of depositional areas for salmon spawning. Mr. Anderson has suggested that the depositional areas are generally not the types of areas that are suitable for salmon spawning. Dr. Stephenson has indicated that this oil making its way into spawning gravels is a very real possibility. NG has not undertaken the necessary work to confirm where the depositional areas and where the spawning areas are for the Kitimat River.

Mr. Anderson, Transcript Vol. 147, lines 20143-20151
Dr. Stephenson, Transcript Vol. 93, lines 15961-15966
Exhibit B132-2, p. 166

946. NG's chronic effects modelling for river sediment for the Kitimat River also suffers from limitations. It is a generalized model, not specific to the Kitimat River, and does not

consider the Kitimat River specific topography and hyporheic flows. It also failed to consider additional oil entering the river as a result of shoreline flushing and refloating of oil. Finally, contrary to what was suggested in NG's response to questioning from the Province of British Columbia, the modelling did not consider a flood event that would overflow the banks of the river and distribute oil throughout the riparian lands of the Kitimat River Valley.

Dr. Stephenson, Transcript Vol. 147, lines 19584-19585, 19595-19597, 19617-19624 and 19631-19632
Dr. Horn, Transcript Vol. 147, lines 19586-19588 and 19598-19599
Dr. Horn, Transcript Vol. 146, lines 18503-18512 and 19430-19439

947. By failing to consider the entrainment of oils in sediments through hyporheic flows in the acute phase and the overlap of depositional areas with salmon and eulachon spawning habitat, NG has ignored a significant pathway of long-term exposure and effects for toxicity of oil to fish.

3.3.2.2 NG Failed to Properly Assess Toxicity of Diluted Bitumen

948. NG's assessment of the toxic effects of oil on fish is not reliable. NG has not filed an adequate amount of information relating to the toxicity of oil to fish, and the oral evidence provided by NG regarding toxicity of oil to fish was careless. While this discussion of NG's toxicity assessment is being addressed in the context of an accident or malfunction relating to a spill of oil into the Kitimat River, it is equally relevant to a spill at the proposed Kitimat Terminal and from marine shipping associated with the proposed project.

949. The Haisla Nation has filed expert evidence by Dr. Peter Hodson and Dr. Tracy Collier and Mr. Jonathan Martin, the *Technical Data Report – Toxicity of Oil to Fish,* that identifies issues associated with the toxicity of oil to fish that has not been adequately addressed by NG. This expert evidence has not been effectively challenged by NG or any other party.

Exhibit D80-27-5

950. Environment Canada is the department within the federal government that has expertise on water quality and toxicology, but relies on work done by others, including Dr. Hodson, who has provided expert evidence on behalf of the Haisla Nation in these proceedings.

Ms. Maclean (EC), Transcript Vol. 167, line 17357
Dr. Hollebone (EC), Transcript Vol. 168, line 17663

951. NG's assessment of the toxicity of oil to fish is inadequate because the oils assessed are not representative of the range of potential products that could by shipped, chronic toxicity has been overlooked, population level effects have not been adequately considered, and there has been no consideration of cumulative impacts or multi-generational effects.

3.3.2.2.1 Samples Assessed Not Representative of Potential Products

952. Literature on the toxic effects of oil to aquatic and terrestrial receptors often focuses on the presence of PAH compounds in hydrocarbon mixtures as being major contributors to

toxicity, so it is important to consider the total amount and composition of PAH compounds in assessing toxicity.

Exhibit B80-2, p. 73
Dr. Horn, Transcript Vol. 146, lines 19488-19489

953. NG limited its assessment of toxicity to three products, which it described as "representative samples". These three products had specific characteristics that are relevant to toxicity to fish, such as: PAH, TPAH, anthracene, fluoranthene, pyrene, chrysene/benzo(a)anthracene.

Exhibit B80-2, pp. 65-72
Dr. Stephenson, Transcript Vol. 146, line 19498

954. NG has stated that the values for hydrocarbons considered in the *EHHRA* contain "relatively small amounts of total PAH", considerably lower than for other well-known crude oils, including Alaska North Slope Crude oil and Alberta Sweet Mixed Blend. From this, NG concluded that the implication is that, although the chemical composition will vary, the hydrocarbons are likely to be significantly less toxic to aquatic life and wildlife than the crude oil released from the Exxon Valdez, which was Alaska North Slope Crude oil.

Exhibit B80-2, p. 73

955. This conclusion is simply not borne out by the evidence. The *Technical Data Report – Toxicity of Oil to Fish* by Dr. Hodson, Dr. Collier and Mr. Martin sets out the concentrations of total alkyl PAH and total EPA priority PAH in a number of oils and refers to a study that specifically examines the composition of oil sands products.[147] During oral questioning it became apparent that NG anticipates transporting a range of products. NG's tariffs will exclude products on the basis of physical characteristics only and not on the basis of composition. Any or all of the products listed in Table 5-4 of Exhibit B80-2, including products with TPAH as high as Alberta Sweet Mixed Blend, could be transported on the project.

Exhibit D80-27-5, p. 59
Mr. Anderson, Transcript Vol. 146, lines 19500-19514

956. The three "representative" samples which NG has assessed contain concentrations of PAH and TPAH that fall at the lower end of PAH and TPAH for the likely products. The TPAH for the three "representative" samples are 1,661 mg/kg for diluted bitumen, 1,683 mg/kg for condensate, and 1,682 mg/kg for synthetic crude. The proposed project, however, could ship oils such as Alberta Sweet Mixed Blend with TPAH of 10,639 mg/kg, which is more than 6 times higher than the levels in the products used by NG in its toxicity analysis. At 10,560 mg/kg, the TPAH for Alaska North Slope Crude is almost but not quite

[147] Yang C, Wang Z, Yang Z, Hollebone B, Brown CE, Landriault M, Fieldhouse B. 2011. Chemical Fingerprints of Alberta Oil Sands and Related Petroleum Products. Environ Forensics 12:173-188.

as high as that of Alberta Sweet Mixed Blend, also more than 6 times higher than in the "representative" samples.

Exhibit B80-2, p. 75, Table 5-4

957. NG's conclusions on the potential toxicity of its products to aquatic organisms, including fish, and terrestrial wildlife have been underestimated as a result of assessing only three "representative" samples – selected by NG – at the low end of the range of potential TPAH concentrations. Accordingly, the products assessed were anything but "representative". As designed, this study could do nothing but understate toxicity. NG has conceded that a six-fold increase in TPAH would have an influence on overall toxicity but asserts that it would not change NG's conclusion that a large oil spill will have significant adverse effects on the ecology of the river. NG did not disclose whether it would change NG's conclusion on chronic toxicity.

Dr. Stephenson, Transcript Vol. 146, lines 19518-19521

958. When specifically asked about the potential for the higher TPAH concentrations to contribute to chronic toxicity, NG did not provide a direct yes or no response. Rather, NG stated that higher concentrations would not necessarily suggest a higher likelihood for chronic effects. NG then referred to having applied a toxicity threshold of 1µg/L TPAH in water that developing fish embryo or eggs would be exposed to. On the basis of the products that NG examined not having reached that 1µg/L threshold, NG concluded that even if the values were somewhat higher, it would just barely creep into that range of 1 to 100 µg/L where incidence of blue-sac disease (BSD) would increase.

Dr. Stephenson, Transcript Vol. 146, lines 19522-19529

959. NG has not looked at the effects of higher TPAH concentrations on chronic toxicity. Further, NG did not deny that these higher concentrations of TPAH could contribute to chronic toxicity, and conceded that an increase in TPAH in oil products would increase the concentration of TPAH in water to which developing fish embryos or eggs would be exposed, exceeding 1 µg/L, the threshold for chronic effects for BSD. The toxicity of oil to fish embryos occurs at TPAH concentrations of 2-7µg/L, based on reported EC50s, i.e., the concentrations causing a median or 50% level of response. With a 50% response to 2µg/L of TPAH, the threshold of toxicity would likely be much lower than 1 µg/L, so a significant degree of effect would be expected at 1µg/L.

Exhibit D80-27-5, p. 59

960. Although there is not necessarily a direct relationship between TPAH concentration and toxicity, failure to consider the potential ranges of products that could be transported on the project undermines the usefulness of the *EHHRA*. There are no published reports of the chronic toxicity of diluted bitumen, synthetic crude, or gas condensate, and none in any of the NG evidence. There is simply not enough known about the toxicity of oil to fish to conclude on the basis of NG's flawed and limited assessment that chronic toxicity is not an issue.

Dr. Hodson, Transcript Vol. 164, lines 11210-11216

961. Further, the three samples erroneously described by NG as "representative" also contain concentrations of fluoranthene, pyrene and chrysene/benzo(a)anthracene that are ***notably lower*** than the highest concentrations found in the products that could be transported by the proposed project: approximately 2 times lower for fluoranthene, approximately 7 times lower for pyrene and approximately 5 times lower for chrysene/benzo(a)anthracene.

Exhibit B80-2, p. 75, Table 5-4

962. When asked about the photo-activation of PAHs by sunlight, NG dismissed this on the basis of the low concentrations of anthracene, fluoranthene, and pyrene in the "representative" hydrocarbons that were assessed:

> **12429**. **MR. McCORMICK:** Would you agree that the narcosis toxicity model does not account for the unique nature of some PAHs to be photo-activated by sunlight?
> **12430**. **DR. MALCOLM STEPHENSON:** That I do agree with.
> **12431**. However, I would further qualify my answer by saying that the particular PAHs are that are known to be associated with photo-activation include anthracene, fluoranthene and pyrene, and that those PAHs are not present at significant concentrations in the hydrocarbons that we're discussing today.

Dr. Stephenson, Transcript Vol. 141, lines 12429-12431

963. As a result of the reliance on samples that NG has erroneously described as "representative" but that do not reflect possible levels of anthracene, fluoranthene, and pyrene in the products to be transported by the proposed project, NG has overlooked important toxicity pathways in its assessment.

964. Finally, anthracene, pyrene and chrysene/benzo(a)anthracene are potentially carcinogenic to humans. NG has identified a potential cancer risk to humans from exposure to chrysene/benzo(a)anthracene. The failure to consider the highest levels of substances that could reasonably be present in the products to be transported by the project undermines the conclusions of the human health risk assessment.

Exhibit B80-3, pp. 142-145, Table 9-6 and p. 156, Table 9-8

965. The *EHHRA* is based on oils that contain chemicals of potential concern (COPC), including TPAH, anthracene, fluoranthene, pyrene, benzo(a)anthracene, that do not reflect highest level of COPCs that could be present in the products to be transported on the proposed project. This belies any claims of "conservatism" that NG makes with respect to this assessment. Thus, the EHHRA cannot be relied upon to dismiss the significance of the potential adverse effects to ecological or human health from a spill of oil.

966. The composition of the products to be transported by the proposed project has implications not only for toxicity but also for how these products behave when released to the environment. Further, this has implications for the human health risk assessment included as part of the *EHHRA* and in the context of marine spills. This aspect of NGs

assessment will be addressed in the context of marine spills (see paras. 1335 to 1354 below).

3.3.2.2.2 NG Unjustifiably Dismissed Pathways of Effects in Oral Testimony

967. During oral questioning, NG suggested that metabolism of oil results in excretion of oil byproducts with no major toxic effects. This assertion ignores the fact that metabolism of oil can also form oxyradicals, which can cause oxidative stress, pathology, and disease. Metabolism of PAH may also create reactive intermediate compounds that are more toxic to aquatic receptors than the parent compounds, the molecular basis for the carcinogenicity of PAH. The possibility of metabolism of PAH contributing to toxicity is acknowledged in NG's *EHHRA*.

Dr. Maki, Transcript Vol. 139, lines 10199-10120
Exhibit D80-27-5, pp. 49-50, 53 and 58
Exhibit B80-3, pp. 22 and 24

968. NG's evidence on the potential for PAHs to have carcinogenic effects is contradictory. On the one hand, the *EHHRA* acknowledges potential cancer risk to humans from chrysene/benzo(a)anthracene. On the other hand, during oral questioning, NG suggested that carcinogenic PAH is found only in PAH mixtures from combustion (pyrogenic PAH) and not in PAH mixtures from oil (petrogenic PAH). Chrysene/ benzo(a)anthracene and benzo(a)pyrene, a known carcinogen, are quite common in oil, including in diluted bitumen. NG has not identified any studies of carcinogenicity of individual alkyl PAH, the most abundant form of PAH in oil, to justify their assertion that cancer cannot be caused by petrogenic PAH.

Exhibit B80-3, pp. 156 and 170
Dr. Maki, Transcript Vol. 140, lines 10877-10881
Exhibit D80-27-5, pp. 87-88

969. During oral questioning, NG mischaracterized a number of peer-reviewed scientific papers by providing only a partial discussion of their content. For example, NG referred to the acknowledgement in *McIntosh et al. 2010* that most oil exposures are of a short duration but most lab toxicity tests measure toxicity of chronic or long-term exposure. What NG failed to acknowledge is that *McIntosh et al. 2010* demonstrated that the toxicity caused by exposure times of 1 to 24 hours is the same as observed from exposure for many weeks, i.e., that brief exposures typical of oil spills are just as capable of causing harm as prolonged exposures.

Dr. Stephenson, Transcript Vol. 141, lines 12297-12299
Exhibit D8-27-5, p. 107

970. In discussing the effect of EVOS on pink salmon, NG referred to a study by *Birtwell et al.* and read into the record an excerpt from the abstract that stated that there were no discernible effects on survival of pink salmon fry that were attributable to exposure to the water soluble fraction of crude oil. NG then equated this to apply to "early life stages of pink salmon", ignoring that *Birtwell* studied only one particular life stage, free swimming

pink salmon fry. Previous studies[148] relied on and cited in the *Technical Data Report – Toxicity of Oil to Fish* by Dr. Hodson, Dr. Collier and Mr. Martin, however, have shown the effects on returns of adult pink salmon after their exposure to oil as embryos, the period between the egg fertilization stage and swim-up, and the developmental stages most sensitive to oil exposure.

Dr. Maki, Transcript Vol. 141, lines 12363-12368
Exhibit D80-27-5, p. 43

971. In oral questioning about *Incardona et al. 2011*,[149] NG dismissed the work done by Incardona on the basis that his work dealt with pyrogenic PAHs at concentrations that do not occur in measurable concentrations in diluted bitumen, and at doses that exceed the water solubility of these compounds. The paper referred to is actually a mini-review of petrogenic (not pyrogenic) PAHs. And, this paper refers to novel mechanisms of injury at levels of low petroleum exposure. Finally, the suggestion that Incardona has acknowledged that the exposure levels were unrealistic is not supported by any evidence and cannot be substantiated.

Dr. Maki, Transcript Vol. 141, lines 12382-12386
Exhibit D80-27-5, p. 65

972. NG suggested in oral evidence that coating oil with gravel for the purpose of studying the effects of oil in sediment results in tremendously high and unrealistic loadings. As shown in Exhibit D80-27-5, this approach generates water accommodated fractions of oil that are toxic to fish embryos at sediment loadings of oil as low as 7 mg/kg, which is obviously much lower than the concentrations of oil predicted for sediments in NG's *EHHRA*: 740 to 430,000 mg/kg.

Dr. Stephenson, Transcript Vol. 146, lines 18683-18685
Exhibit D80-27-5, p. 61
Exhibit B80-3, p. 73

973. In discussing photo-activation, NG dismissed the potential phototoxicity of anthracene, fluoranthene and pyrene on the basis that the concentrations are too low in the "representative" samples studied by NG, and ignores other photo-toxic compounds such as retene (C4 alkylphenanthrene). Further, the phototoxicity of most alkyl PAH, which comprise more than 85% of total PAH in oil, has never been tested, suggesting that the potential phototoxicity is highly uncertain and could be greatly under-estimated. Finally, previous studies relied on and cited in the *Technical Data Report – Toxicity of Oil to Fish* by Dr. Hodson, Dr. Collier and Mr. Martin, stated that Pacific herring eggs and larvae were

[148] Heintz RA, Rice SD, Wertheimer AC, Bradshaw RF, Thrower FP, Joyce JE, Short JW. 2000. Delayed effects on growth and marine survival of pink salmon *Oncorhynchus gorbuscha* after exposure to crude oil during embryonic development. Mar Ecol-Prog Ser 208:205-216.
[149] Incardona J.P., T.K. Collier, and N.L. Scholz. 2011. *Oil spills and fish health: exposing the heart of the matter*. J. Exposure Sci. and Environmental Epidemiol. 21:3-4.

exquisitely sensitive to oil spilled from the ship *Cosco Busan* in San Francisco Bay, after exposure to sunlight.[150]

Dr. Stephenson, Transcript Vol. 141, lines 12430-12431
Exhibit D80-27-5, pp. 88 and 50

974. NG sought to downplay the toxicity of oil to fish by referring to it as a "natural" material based on the same building blocks as everything else on the planet, and states that the environment can handle hydrocarbons in low level doses. This testimony ignores peer-reviewed literature on oil toxicity to fish, as well as other aspects of NG's own evidence.

Dr. Maki, Transcript Vol. 143, lines 15032-15014
Exhibit D80-27-5
Exhibit B80-3, p. 20

975. NG dismissed the possibility of spawning beds in streams being oiled on the basis of a personal recollection of not having seen any oiled streams post-EVOS. This testimony ignores the fact that the oiling of tidal streams, including salmon spawning habitat, due to concentrations of beach gravel around the stream, is well documented, and does not necessarily result in visible oil being present.[151]

Dr. Owens, Transcript Vol. 145, lines 17313-17316

3.3.2.2.3 NG Misguidedly Dismissed Potential for Chronic Effects

976. NG has misguidedly dismissed the potential for chronic effects, largely on the basis of a failure to consider the full suite of products to be transported by the proposed project, as discussed above, and due to a failure to appreciate the consequence of short exposure to oil on fish health.

977. The *Technical Data Report – Toxicity of Oil to Fish* by Dr. Hodson, Dr. Collier and Mr. Martin sets out in detail the concerns associated with a spill of oil or condensate into the Kitimat River and long-term health and viability implications from chronic exposure or early life-stage exposure.

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[150] Incardona JP, Ylitalo GM, Myers MS, Scholz NL, Collier TK (NOAA) and Vines CA, Griffin FJ, Smith E, Cherr GN (BML). 2011. *The 2007 Cosco Busan oil spill: Field and laboratory assessment of toxic injury to Pacific herring embryos and larvae in the San Francisco estuary*: Final Report. 82 p. Available at: http://www.fws.gov/contaminants/Restorationplans/CoscoBusan/Cosco_Settlement/App_D_Herring_Injury_Study.pdf). Results from this work had been submitted for publication as two papers but had not been accepted at the time the Haisla Nation evidence was filed, to the *Technical Data Report – Toxicity of Oil to Fish* did not include the peer-reviewed papers, which have not been published. These are: Incardona, J.P., C.A. Vines, T.L. Linbo, M.S. Myers, C.A. Sloan, B.F. Anulacion, D. Boyd, T.K. Collier, S.G. Morgan, G.N. Cherr, and N.L. Scholz. 2012. *Potent phototoxicity of marine bunker oil to translucent herring embryos after prolonged weathering*. PLoS ONE 7(2):e30116; and Incardona, J.P., C.A.Vines, B.F. Anulacion, D.H. Baldwin, H.L. Day, B.L. French, J.S. Labenia, T.L. Linbo, M.S. Myers, O.P. Olson, C.A. Sloan, S. Sol, F.J. Griffin, K. Menard, S.G. Morgan, J.E. West, T.K. Collier, G.M. Ylitalo, G.N. Cherr, and N.L. Scholz. 2012. *Unexpectedly high mortality in Pacific herring embryos exposed to the 2007 Cosco Busan oil spill in San Francisco Bay*. Proc. Natl. Acad. Sci. 109:E51-E58.

[151] Carls, M.G., Thomas, R.E., Lilly, M.R., and Rice, S.D. 2003. *Mechanism for transport of oil-contaminated groundwater into pink salmon redds*. Mar Ecol Progr Ser 248: 245–255. Exhibit D203-4-12, p. 29.

Exhibit D80-27-5

978. In response to direct questioning from the Panel, NG mistakenly stated that acute narcosis to fish is reversible, ignoring recent peer-reviewed studies that demonstrate elevated rates of mortality and deformities in fish embryos 15 days following oil exposures as brief as 1 to 2 hours, which would result in significant impacts on fish recruitment and fish abundance.

Dr. Stephenson, Transcript Vol. 148, line 22739
Exhibit D80-27-5, p. 17

979. Further, when asked by the Panel whether an acute effect would exacerbate a chronic effect, NG provided an answer to a different question: whether chronic effects from exposure at the egg stage could affect acute toxicity from narcosis. This response was evasive and potentially misleading. In providing this response, NG ignored the findings of the peer-reviewed literature on embryo toxicity that NG has reported and that has been set out in detail in the *Technical Data Report – Toxicity of Oil to Fish*.

Dr. Stephenson, Transcript Vol. 148, lines 22383-22387
Exhibit B80-3, p. 21-23
Exhibit D80-27-5, pp. 48-56, specifically pp. 50-51

980. In discussing toxicity of oil to herring embryos, NG sought to dismiss the potential effect resulting in fin rot because fish eggs do not have fins. This unhelpful answer ignores that fish eggs contain developing fish embryos, which do indeed have fins. Fin erosion is an early sign of toxicity and indicates genotoxicity; fin erosion will ultimately affect swimming performance and susceptibility to infection.

Dr. Stephenson, Transcript Vol. 147, lines 20338-20339
Exhibit D80-27-5, p. 50, 52-53, 56 and 107 (row 4)

981. In further discussions of toxicity of oil to herring, NG's evidence misrepresented data from two published papers,[152] implying that the risk to fish embryos of oil exposure, and hence to fish recruitment and fish abundance is miniscule. This evidence is misleading in implying that the only time oil exposure could cause toxicity is at fertilization, that toxicity of oil to embryos will occur only during an extremely short period of development resulting in a low risk, and that lab studies do not apply to a spill of oil into the Kitimat River because they were done with oil that was chemically dispersed. The paper by *McIntosh et al. 2010* clearly demonstrates that herring embryos are sensitive to realistic levels of oil exposure throughout all stages of embryonic development.

Dr. Stephenson, Transcript Vol. 147, lines 20342-20352
Exhibit D80-27-5, pp. 56-62

[152] McIntosh S, King T, Wu D, Hodson PV. 2010. *Toxicity of dispersed weathered crude oil to early life stages of Atlantic herring* (*Clupea harengus*). Environ Toxicol Chem 29:1160-1167; Greer, CD, Hodson, PV, Li, Z, King, T, Lee, L. 2012. *Toxicity of crude oil chemically dispersed in a wave tank to Atlantic herring (Clupea harengus) embryos*. Env. Tox. Chem. 31: 1324-1333).

982. Further, *Wu et al. 2012*,[153] quoted in the *Technical Data Report – Toxicity of Oil to Fish* by Dr. Hodson, Dr. Collier and Mr. Martin, showed that rainbow trout exposed to four different crude oils half-way through their embryonic development, were highly sensitive to oil toxicity. The studies of the toxicity of petroleum hydrocarbon released from oil stranded on gravel reviewed in the *Technical Data Report – Toxicity of Oil to Fish* demonstrate that chemical dispersants are not required for toxicity to fish embryos.

Exhibit D80-27-5, pp. 50, 59 and 113

983. NG's evidence is based almost exclusively on the Di Toro target-lipid model. Subsequent research has shown significant potential for sublethal effects from much lower concentrations than previously thought. By focusing on the Di Toro model to the exclusion of other peer-reviewed literature, important pathways for chronic effects have been ignored. Neither Fisheries and Oceans Canada nor Environment Canada have assessed whether the Di Toro target-lipid model is effective or an appropriate means to assess what NG has used it to assess.

Exhibit D80-27-5, p. 49-56
Dr. Hodson, Transcript Vol. 164, line 11151
Dr. Caza (EC), Transcript Vol. 168, lines 17716-17718

984. NG has misguidedly dismissed potential chronic toxicity of oil to fish by not giving due consideration to important chronic effects.

3.3.2.2.4 *EHHRA* Does Not Assess Population Level Impacts to Fish

985. In its assessment of environmental effects of the proposed project from construction and operations, NG has identified that, for wildlife at least, the important question to ask is whether there will be an effect at the population level. Yet NG has not done this for the effects of a spill on fish populations of the Kitimat River. Because of the focus on toxicity to individual species, there are few references to higher level ecosystem effects in the *EHHRA*.

Exhibit B3-6, p. 56

986. In answering questions from the Panel, NG referred to "a lot of discussion about whether effects on some fish will translate into a population level effect". This was a reference to evidence provided in response to oral questioning about the experiences following EVOS and not NG's written evidence.

Dr. Stephenson, Transcript Vol. 148, line 22378

987. NG's *EHHRA* has not explored the long-term impacts on fish production and fisheries productivity of acute fish kills in the Kitimat River that could flow from a spill of oil. Haisla Nation evidence has concluded that the river spawning population of sockeye salmon and the eulachon, species that use only the main stem of the river for spawning, would likely be extirpated if there was a spill that killed adult fish during the spawning migration.

[153] Wu D, Wang Z, Hollebone B, McIntosh S, King T, Hodson PV. 2012. *Comparative toxicity of four chemically-dispersed and undispersed crude oils to rainbow trout embryos*. Environ Toxicol Chem. 31:754-765.

Dr. Stephenson, Transcript Vol. 147, lines 20398-20400
Exhibit D80-27-5, p. 35

988. NG's application and evidence ignores scientific data concerning toxicity of the products which will be transported by the proposed project, putting into question the reliability of NG's evidence and undermining the assertions put forward by NG concerning the overall risk of the proposed project. NG has thus ignored potential pathways of effect for toxicity of oils.

3.3.2.2.5 Haisla Nation Evidence on Toxicity of Oil to Fish

989. The evidence NG has provided on the toxicity of oil and condensate to fish and the potential impacts resulting from a spill of oil or condensate into the Kitimat River is incomplete and fails to consider fully the potential chronic toxicity of such spills. As a result, the Haisla Nation chose to supplement the evidentiary record by submitting an analysis of the toxicity of oil to fish and potential impacts in the Kitimat River. The Haisla Nation presented expert witnesses – Dr. Hodson and Dr. Collier – to speak to this evidence. NG chose not to question or to test this evidence. As a result, its reliability is uncontroverted.

990. The *Technical Data Report – Toxicity of Oil to Fish* includes the following key findings, which are based on the detailed assessment of peer-reviewed literature on toxicity of oil to fish in the Kitimat River context:

- An oil spill to a tributary or the main stem of the Kitimat River would spread quickly over water and move downstream, following the current and gradient of the river surface.
- An immediate fish kill would likely occur in any area covered with an oil slick.
- The size and impacts of a fish kill would likely be greater for spills of condensate than for spills of synthetic crude oil or bitumen. Nevertheless, all three products contain sufficient low molecular weight compounds to cause fish kills.
- A fish kill would affect all species and life stages present in the river at the time of the spill.
- Because the river is used throughout the year by a variety of salmonid and other species for spawning, rearing of embryos and fry, and growth of adults to sexual maturity (some species), there is no period of "least risk" of an oil spill.
- Oil spill remediation techniques that involve the removal of contaminated sediments, or cleaning of sediments *in situ*, would cause as much damage to fish habitat and to communities of benthic organisms as the oil spill itself. The significant adverse effects of the spilled oil and of the removal of contaminated sediments can be neither mitigated nor avoided.
- The fish species that are most vulnerable to reproductive impacts of spilled oil are those whose embryos would be exposed to oil entrained in spawning shoals in bed sediments.
- Concentrations of waterborne TPAH associated with chronic toxicity of oil to the early life stages of fish range from about 1 to 100 µg/L.

- The effects of chronic toxicity include higher rates of mortality, reductions in growth, increased frequencies and severities of deformities and pathology, and increased rates of hydrocarbon metabolism and excretion.
- The risk of toxicity of some individual PAH (e.g. anthracene) accumulated by fish embryos will be greatly increased if they are exposed to light when they emerge from gravel as larvae.
- Exposure of fish to oil will reduce their immunity to natural pathogens. Combined with the stress of exposure to oil and stress due to natural factors such as food limitation, spawning migration, saltwater and freshwater adaptation, and temperature change, impaired immunity may trigger epidemics of disease that could decimate fish stocks.
- There is a risk of an elevated incidence of cancer in fish following exposure to some PAH found in oil.
- Oil could remain trapped in the sediment from months to years. The effects on fish reproduction of sediment contamination will also last for months to years, reflecting the residence time of oil in spawning shoals.
- There is a potential for reductions in returns of migrating adult salmon because of delayed effects of exposure to oil as eggs and embryos that would reduce survival during growth and maturation at sea.
- Avoidance is not an option for early life stages of fish.

Exhibit D80-27-5, pp. 8-11

991. In summary, a spill of oil into the Kitimat River could have long-term devastating effects on the fish populations in the Kitimat River. NG has not provided adequate evidence about these effects and has not considered them properly in its assessment of the significance of adverse effects.

992. The Haisla Nation's evidence on the toxicity of oil to fish is more reliable than NG's evidence, and should be accorded more weight. NG's oral evidence has attempted to minimize concerns about the toxicity of oil to fish and other aquatic species by basing its analysis on hydrocarbons it characterizes as broadly representative but which fail to capture the full range of potential COPC concentrations, by mischaracterizing peer-reviewed literature, by dismissing chronic toxicity concerns, and by failing to provide direct answers to questions asked by intervenors and the Panel. The Haisla Nation's evidence suffers from none of these frailties.

993. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled from the proposed pipeline is not reliable because it does not consider the full range of products that could be shipped on the proposed project.**

994. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled from the proposed pipeline is not reliable because it does not consider all the potential pathways of effect.**

995. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled from the proposed pipeline is not reliable because it does not fully consider chronic toxicity.**

3.3.3 Impacts of Response and Cleanup Operations not Assessed

996. NG's approach to managing the effects of an accident or malfunction that results in a spill of oil is to launch an emergency spill response to contain, remove/clean up, and restore or rehabilitate. NG acknowledges that the activities associated with cleanup can themselves cause impacts to the biophysical environment, but has not assessed the degree and extent of those impacts.

> *Dr. Taylor and Mr. McHugh, Transcript Vol. 147, lines 20139-20138*
> *Exhibit D80-27-5, p. 9*

997. NG proposed to use a Net Environmental Benefit Assessment to determine whether the proposed action required for response, clean up and restoration is likely to have a greater detrimental effect to the environment than the alternative of not taking the proposed action and living with the environmental consequences of this. This usually entails a compromise, between destroying habitat vs. removing oil.

> *Exhibit B21-2, pp. 45-46*
> *Dr. Hollebone (EC), Transcript Vol. 169, lines 20065-20073*

998. NG has not assessed the potential adverse effects associated with oil spill response. These effects must be considered in assessing the reliability which can or ought to be placed on oil spill response activities as mitigation.

3.4 Mitigation Not Demonstrated

999. NG has exaggerated its ability to mitigate the effects of a spill of oil or condensate into the Kitimat River and on human populations in the Kitimat area.

3.4.1 Response Capacity Not Demonstrated

1000. NG has not demonstrated the capacity to respond effectively to a spill. As a result, serious questions remain about the ability of NG to mitigate the effects of a spill through a response effort.

1001. NG has acknowledged that it must do additional work **to ensure that it can** respond effectively to a spill. In Transcript Vol. 91, when answering a question about the amount of work that should be done to demonstrate that NG will be able to mount a world-class spill response, Mr. Greg Milne, Senior Manager, Environmental Operations, Enbridge Pipelines, stated:

> **13330**. So I guess -- just to point -- to note that, at this point, a lot of what we have provided is the first stages in the development of these plans and there's much more to be done. Northern Gateway is as concerned, I would venture, as most of the people in this room to **ensure that we can** effectively respond to incidents in these remote areas and in any area along the pipeline (emphasis added).

> **13331**. So **we want to take use of these next several years to ensure** that we **can** develop our -- those plans and that we **can** be effective (emphasis added).
>
> *Mr. Milne, Transcript Vol. 91, lines 13330-13331*

1002. At this stage, NG should not be allowed to rely on spill response as mitigation for the effects of an accident or malfunction, given the significant information gaps that exist with respect to spill response[154] and NG's own uncertainty about whether it can be effective in responding to a spill in a remote area such as the Kitimat River Valley.

3.4.2 Failure to Plan for Evacuation from Kitimat and Kitamaat Village

1003. The *EHHRA* has concluded that for a full bore rupture in the Kitimat River Valley, risk to human health as a result of hazard quotient exceedances would dictate closing the area to the public and advising people to leave until ambient air monitoring demonstrates that it is safe to return. Yet NG has not provided any evidence that demonstrates how an evacuation of people from the Kitimat and Kitamaat Village areas would be carried out.

1004. NG has not provided an emergency evacuation response plan as part of ESA. NG will not prepare detailed and specific emergency plans which define responder staffing levels and locations until the detailed engineering planning and construction phase of the proposed project. As a result, NG has not demonstrated that an evacuation of people from the Kitimat and Kitimaat Village areas could be carried out.

> *Exhibit B21-2, p. 23*
> *Exhibit B47-6, p. 18*
> *Exhibit B47-6, p. 9*

1005. When questioned about the basic protocol on an emergency evacuation, NG was incapable of providing a competent response.

> **24590. MEMBER BATEMAN:** Does Northern Gateway anticipate that it would assist or perhaps assume responsibility in advance for 72-hour kits which often alleviate a lot of the intrusion and suffering that can occur when someone is displaced from their home?
> …
> **24597.** I'm not familiar with the 72-hour kit, but any, you know, water, all those types of things, we would ensure that those are in place. If we're evacuating people, it's not just a matter of making sure they have a residence, we know it needs to go beyond that.
>
> *Mr. Underhill, Transcript Vol. 100, lines 24590-24597*

1006. NG's response illustrates goodwill but a complete lack of knowledge of the most basic components an evacuation.

[154] The term "spill response" is being used here to capture emergency spill response, cleanup and remediation.

1007. NG has stated that it will be responsible for monitoring a spill and advising emergency responders if conditions raise safety concerns that warrant an evacuation. If a community is not equipped with the expertise to undertake an evacuation, then NG will provide assistance.

Mr. Underhill, Transcript, Vol. 100, line 24576-24582

1008. NG has not demonstrated a capacity to monitor, and to assist during a spill event in a timely and competent manner. It simply is not possible to know if NG will allocate adequate resources to ensure a safe and expeditious evacuation of Kitimat or Kitamaat Village if one is required.

1009. Events following the spill of 3,750,000 L of oil into the Kalamazoo River demonstrate that Enbridge`s track record for developing adequate emergency response plans is poor. The response plans Enbridge sought to rely on during that spill were inadequately developed and were not effective. As a result, people's safety was put in peril: 46 evacuations were required on July 28, 2012 and 50 more homes were recommended to be evacuated on July 29, 2012.

Exhibit D4-5-4, pp. 63-64

1010. The Kalamazoo spill illustrates that catastrophes occur when appropriate plans are not in place. Enbridge's plans were not subject to an external review. According to its own self-assessment, Enbridge affirmed that its plans were adequate, whereas reality shows that its plans were grossly deficient.

1011. According to Enbridge's self-assessment, its "facility response plan identifies spill recovery strategies appropriate for the response zones."

Exhibit D4-5-4, p. 40

1012. Enbridge's facility response plan was clearly not appropriate for the response zone. When the United States Environmental Protection Agency (EPA) consulted Enbridge's plan during the initial phase of the response to the Kalamazoo spill, the EPA noted that the plan did not have information specific to spill response at any particular location. Thus, at the most critical time, no one could not rely on this plan.

Exhibit D80-69-3, pp. 8 and 112

1013. In its self-assessment, Enbridge affirmed that its "plan identifies enough trained personnel to respond to a worst-case discharge."

Exhibit D4-5-4, p. 40

1014. Enbridge's personnel were not adequately trained to respond to the Kalamazoo spill. The NTSB concluded that Enbridge failed to train the control center staff to perform effectively as a team, when effective team performance was most needed. Further, Enbridge's emergency response actions during the initial hours were not sufficiently focused on source control and demonstrated a lack of awareness and training in the use of effective containment methods. Thus, despite Enbridge's self-review, its plan and personnel were not prepared to respond to a worst-case discharge.

Exhibit D80-69-3, p. 135
Exhibit D80-69-3, p. 146

1015. According to its self-assessment, Enbridge affirmed that its plan "identifies enough spill containment equipment and recovery capacity to respond to a worst-case discharge to the maximum extent practicable".

Exhibit D4-5-4, p. 40

1016. Enbridge did not have sufficient equipment or recovery capacity to respond to the Kalamazoo spill. According to the NTSB, Enbridge's crews primarily deployed sorbent booms in the fast-flowing Talmadge Creek, which, according to industry and federal guidance, was an ineffective method of containing a large release of oil. Had more effective containment measures been placed at strategic locations along Talmadge Creek less oil might have entered the Kalamazoo River. NTSB investigators further observed that the equipment used for the containment was not part of Enbridge's response equipment inventory. Thus, despite Enbridge's satisfactory self-assessment, its plan and personnel were not equipped with the necessary equipment and recovery capacity to respond effectively to the Kalamazoo spill.

Exhibit D80-69-3, pp. 146-147

1017. The foregoing examples illustrate that Enbridge's review of its plan was ineffective in identifying and correcting deficiencies. NG has not provided any evidence to demonstrate that its emergency evacuation response plan will be any more than Enbridge's response plan was for the Kalamazoo spill.

1018. NG has not developed an emergency response plan, and does not intend to develop detailed and specific emergency plans which will define responder staffing levels and locations until the detailed engineering planning and construction phase of the proposed project. Consequently, it is not possible to determine whether NG is or will be capable of conducting a safe, efficient and expeditious evacuation of people from the Kitimat and Kitamaat Village area, if one is required.

3.4.3 Spill Response in the Kitimat River Valley

1019. Effective spill response in the Kitimat River Valley will be challenging. Enbridge encountered a series of challenges in its response to the spill of 3,750,000 liters of diluted bitumen into the Kalamazoo River at Marshall, Michigan. In addition to not having adequate plans in place, Enbridge was not prepared for how the spilled diluted bitumen would behave.

1020. Enbridge was not able to effectively capture the submerged diluted bitumen as it was transported downstream.

Mr. Underhill, Transcript Vol. 98, lines 21607-21616

1021. Observations from the NTSB Report on attempts to contain and clean up the oil in the Kalamazoo River further demonstrate the difficulties associated with responding to that spill:

- Fast currents rendered booming unsuccessful: failed attempts to deploy conventional and sorbent boom when the Kalamazoo has an average current velocity of 0.64m/s delayed the response.

- Once the oil entered the water, weathering, volatility, and physical agitation caused it the denser fraction to sink and incorporate into the river sediments and collect on the river bottom.

- Enbridge had to resort to in dredging, excavation and aeration to remove submerged oil.

Exhibit D80-69-3, p. 15
Exhibit B92-3, pp. 77-78

1022. Yet the Kalamazoo River is an "easy" spill response river compared to the Kitimat River. Enbridge was able to use 33 river control points on the 38 mile (61 km) stretch of the Kalamazoo River. The **average** flow rate in the Kitimat River is greater than **peak** flow in the Kalamazoo River. These conditions will make spill response in the Kitimat River far more challenging than in the Kalamazoo River. Environment Canada has acknowledged that the context for the Kalamazoo spill is very different from Northern British Columbia.

Mr. Underhill, Transcript Vol. 98, lines 21596-21597
Mr. Underhill, Transcript Vol. 96, lines 20000-20089 and 20094-20095
Dr. Hollebone (EC), Transcript Vol. 170, line 21708

1023. In September of 2010 the Haisla Nation made submissions on the adequacy of the information contained in NG's application. Those submissions identified concerns about an accident or malfunction of the pipeline resulting in a spill into the Kitimat River. The Haisla Nation specifically sought additional information about how NG proposes to respond to a spill, including information about spill control and cleanup technology, what amount of oil or condensate can be successfully removed from the environment, what additional studies will be done into the fate, impact and effects of oil not removed, and how spills will be managed in remote locations under inclement conditions. The Haisla Nation also asked for an oil spill response plan and a marine transportation oil spill response plan.

Exhibit C144-1, p. 14

1024. Despite having had 2.5 years to do so, NG has not demonstrated through its filed material or oral evidence that it will be able to respond quickly and effectively to a spill into the Kitimat River. Further, although NG has offered repeated platitudes[155] regarding the effort NG will bring to bear to a response effort, NG has been unable to provide concrete support for this assertion.

1025. NG has not filed a response plan for the Kitimat River Valley. NG's current response plan is a plan to prepare a plan.

[155] See Transcript Vol. 96, lines 19307-19308 (Mr. Underhill); Transcript Vol. 97, lines 20292-20296 (Dr. Taylor); Transcript Vol. 146, line 18713 (Mr. Green), line 18837 (Mr. McHugh), lines 18840-18843 (Dr. Taylor), line 18877 (Mr. McHugh); Transcript Vol. 147, line 19800 (Dr. Taylor), line 19975 (Mr. McHugh).

Mr. Milne, Transcript Vol. 97, lines 20207-20208

1026. NG has done additional work done in the Kitimat River Valley, ostensibly to demonstrate that it is taking the Haisla Nation's concerns seriously and that it will be able to respond effectively to a spill in the Kitimat River Valley.

Mr. McHugh, Transcript Vol. 147, lines 19758-19759
Mr. Anderson, Transcript Vol. 147, lines 20023-20026

1027. This additional work has missed its mark:

- There is a stretch of the proposed pipeline route in the Kitimat River drainage that is greater than 2 km from public road access in the winter. NG was unable to provide clear assurances about how the Upper Kitimat River Valley would be accessed in the event of a spill.

  Exhibit B-159-1, NG Response to Undertaking U43
  Mr. McHugh, Transcript Vol. 147, lines 19777-19770

- NG was unable to provide time estimates for the time required to deploy response equipment once a response site is reached.

  Dr. Taylor and Mr. McHugh, Transcript Vol. 147, lines 19956-19975

- NG could not identify a response site along the Kitimat River where it could say with certainty it will be able to use booms at all times of the year for all river conditions.

  Mr. McHugh, Transcript Vol. 147, line 20014

- Northern Gateway does not currently have a good understanding of potential pathways for a spill to travel from the Kitimat industrial area into the Lower Kitimat River, surrounding wetlands and the Kitimat River Estuary.

  Exhibits B83-13, p. 15 and B83-15, p. 1
  Mr. McHugh, Transcript Vol. 147, lines 19900-19910

1028. In discussion of the spill of 3,750,000 liters of diluted bitumen into the Kalamazoo River at Marshall Michigan, NG referred repeatedly to the "learnings" from that spill. Yet when asked some basic questions about this spill, NG's Manager of Emergency Management was unable to answer them. This raises serious questions about previous assurances provided by NG about the "learnings" from Kalamazoo informing NG's response capability.

Mr. Fiddler, Transcript Vol. 87, line 7649
Mr. Underhill, Transcript Vol. 92, lines 13916 and 14841
Mr. McHugh Transcript Vol. 147, lines 19703-19706

1029. NG has not demonstrated that it will be able to respond quickly and effectively to a spill of oil in the Kitimat River Valley. Significant information gaps remain about how a spill response would be carried out.

3.4.4 Significant Information Gaps

1030. NG has failed to acquire critical information for spill response planning that is necessary to determine the extent to which an effective response can be provided.

- NG has not considered the difficulties of evacuating the human population from Kitimat.
- NG has not determined which watercourse locations are accessible by boat.

  Transcript Vol. 91, lines 13231-13232

- NG has not measured river velocities at potential control points during high, medium and low flow rates.

  Transcript Vol. 95, lines 17602-17604

1031. Even in the Kitimat River Valley, where NG undertook to showcase potential response sites in reply to concerns expressed by the Haisla Nation that NG would not be able to effectively respond, NG has failed to acquire and provide the following basic information:

- River velocity measurements at potential preliminary response sites.

  Transcript Vol. 147, lines 19758-18759, 19996-20002, and 20014-20016

- Mapping of depositional areas.

  Mr. Anderson, Transcript Vol. 147, lines 20149-20150

- Thorough identification of high consequence areas. The map sheets provided for the Kitimat River are preliminary and fail to disclose the fact that the entire river is habitat for harvested species. Also the map sheets identify high consequence areas at watercourse crossings, but fail to recognize that the entire Kitimat River itself is a high consequence area.

  Exhibit B83-16, pp. 3-10

3.4.5 Inability to Contain and Recover Oil

1032. Chief Councillor Ellis Ross has testified to his first-hand experience with oil spills:

> **4275**. So I went there, and you know what, the only words I can describe what I thought about myself after that is basically useless, helpless, because it didn't matter what I did. In a creek that small, that accessible, literally, just walk off the highway, there's nothing I could do to stop that diesel from going further and further down that creek.
> …
> **4279**. The other incident I had was when I was working for a charter boat company out of Kitimat, District of Kitimat. And a tugboat down at our dock here sunk, dumping all its diesel into the water. Well, we were called in because we were the representative Berrard (ph) Spill [Burrard Clean] for our region.

> **4280**. Optimal conditions; the water's calm, you're working off the dock, you got every gear that you can think of, you can pack it down. We still couldn't pick that diesel up. In fact, most of it got under the dock and it took a year for it to all leech [sic] out, but we spent a couple days down there trying to do what we could, basically mopping it up.
>
> *Chief Councillor Ellis Ross, Transcript Vol. 8, lines 4275-4281*

1033. NG's application does not portray the difficulties associated with removing spilled oil from the environment adequately or realistically. NG has not provided evidence that demonstrates the existence of effective tools to contain a spill of oil in a fast moving river like the Kitimat River. Further, NG has not provided any assurance that oil that submerges or sinks can be recovered.

1034. NG has filed a *Preliminary Kitimat River Drainage Area Emergency Preparedness Report*, which includes *Appendix C, Response Tactics for Floating Oils* and *Appendix D, Response Tactics for Techniques for Submerged and Sunken Oils*. These materials refer to techniques or tools that are all subject to controlling variables.

1035. In many instances, the controlling variable is current speed. Most of the containment techniques are not effective in the currents anticipated to occur in the Kitimat River (1.3 m/s to 3.9 m/s). For floating oils, the containment techniques are only effective in currents up to 2.0 m/s. The specialized techniques for fast currents include deflecting booms, but the boom deflection angle table only contemplates current speeds up to 1.67 m/s.

> *Exhibit B80-4, p. 83*
> *Exhibit B17-1, p. 45*
> *Exhibit B83-16, p. 13 and 28*
> *Dr. Taylor, Transcript Vol. 97, line 20368*

1036. For non-floating oils the effectiveness of containment options is limited to current speeds of 0.75 knots, which is the equivalent of 0.39 m/s. During oral questioning, NG eventually conceded that there are no effective containment techniques for submerged oil in water moving at 0.75 knots. This is significantly slower than the 1.3 to 3.9 m/s speeds which can be expected in the Kitimat River.

> *Exhibit B83-16, p. 33*
> *Dr. Taylor and Mr. McHugh, Transcript Vol. 147, lines 20071-20128*

1037. Moreover, NG appears to be in denial about the lack of adequate tools for containing submerged oils in rivers. The question about the limitation of such tools had to be asked no less than 8 times before NG conceded that there are no effective containment techniques at river speeds greater than 0.39 m/s.

> *Dr. Taylor and Mr. McHugh, Transcript Vol. 147, lines 20071-20128*

1038. NG's submerged oil recovery plans are general, and demonstrate a number of concerns about the ability to recover submerged oil, the extent to which this mitigates impacts, and the potential for the recovery operations themselves to damage the environment.

1039. The Submerged Oil Recovery Plan documents indicate that the recovery of submerged oil generally requires first determining where the submerged oil has settled. This was confirmed by NG's oral evidence. Delineating where the submerged oil is will take time, allowing for ongoing exposure to oil.

Exhibits B132-5 and B132-6
Mr. McHugh, Transcript Vol. 147, lines 20030-20032

1040. Environment Canada has confirmed that some techniques for locating sunken oil may be temperature dependant noting that temperature may affect the accuracy of the assessment of how much sunken oil may be present in a given location.

Dr. Hollebone (EC), Transcript Vol. 170, lines 21502-21509

1041. Recovery of submerged oil involves refloating it for recovery downstream or dredging to remove contaminated sediment. Both methods entail a degree of substrate disturbance. Refloating requires releasing the oil from the sediment to mobilize it, through various methods. This will necessarily entail disturbance of the sediment, which may result in significant damage to sensitive spawning habitat.

Exhibit B132-6, pp. 8-15 and 17-20

1042. The photographs showing these various methods in action are all of calm slow moving water bodies. These techniques appear like they would be difficult to implement in a fast moving river. Further, as set out above, options for containment of refloated oil in a fast moving river are limited.

Exhibit B132-6, pp. 8-13

1043. The *Submerged Oil Recovery Plan* also discusses dredging, "an aggressive recovery technique" that "disrupts and destroys the existing habitat". It is identified as most applicable in areas with low or minimal habitat value, so this would not to be a viable option for the Kitimat River.

Exhibit B132-6, p. 17

1044. The techniques available for the recovery of submerged oil all entail sediment disruption, which may not be suitable for the Kitimat River, which is recognized as highly sensitive fish habitat. The ability to recover oil from the Kitimat River must be considered limited, and therefore of low mitigative value in terms of assessing significance of adverse effects.

1045. Spill response is something which must happen quickly and like clockwork if it is to be effective:

On a spill, you do not have time to gather more information.

Dr. Owens, Transcript Vol. 145, line 18256

1046. Although an environmental assessment process is by its very nature a predictive process,[156] the predictions must be based on a reasonable foundation of evidence. Intention alone, in the absence of demonstrable steps taken toward achieving the desired result is simply not a reasonable evidentiary foundation on which the Panel can rely to predict that NG will be able to respond quickly and effectively to a spill.

1047. The approach of adaptive management as mitigation which has gained acceptance in the environmental assessment context is not appropriate in the context of emergency spill response in the Kitimat River. If emergency spill response is to be a valid form of mitigation, the ability to actually conduct it quickly and effectively must be established at the assessment stage. NG has failed abjectly to do this.

1048. As a result of NG's failure to demonstrate that it can respond quickly and effectively to a spill, the Panel cannot rely on emergency spill response as mitigation for the significant adverse effects of a spill for the purposes of this assessment. This mitigation is too uncertain and too remote.

1049. The totality of the evidence establishes that NG's assertion that a pipeline rupture will be addressed remotely within 13 minutes is profoundly unrealistic. NG's environmental harm scenarios – derivative as they are on this unrealistic assumption – must, by definition, profoundly understate the environmental risk. This fundamental flaw in NG's application militates strongly against any favourable recommendations from the Panel.

1050. **Finding Requested: The Panel should find that NG has not demonstrated that spill response will be able to mitigate the effects of a spill from the proposed pipelines.**

1051. **Finding Requested: The Panel should find that the proposed project is likely to result in significant adverse environmental effects from the proposed pipelines.**

4. Haisla Nation Concerns

1052. The proposed project requires the alienation of land to which the Haisla Nation asserts aboriginal title and where Haisla Nation members exercise their aboriginal rights. It will result in the clearing of a vast linear corridor through Haisla Nation Territory:

> During construction, surface disturbance will lead to loss of surface vegetation, old growth forests, wetlands, rare plants, rare ecological communities and timber resources within the PDA (see Table 8-52).
>
> *Exhibit, B3-5, p. 41*

1053. The pipeline corridor passes through the following *wa'ais*: *Na'labila, Niqwa and Wadin*, *Uxdewala*, *Giyu'yuwa*, Laxakas, *Simgas* and *Zagwis*, *Yaksda* and *Bisamut'is and Wo'axdu.* These areas have been traditionally and are currently used by Haisla Nation members in the exercise of their aboriginal rights in the form of fishing, hunting, trapping, harvesting and gathering. The details of this use is set out in Dr. Powell's *Stewards*, in the affidavits of Haisla Nation members and in Haisla oral testimony.

> *Exhibit D80-22-4, pp. 36-58*

[156] *Inverhuron & District Ratepayers Ass*. v. *Canada (Minister of the Environment),* 2001 FCA 203.

Exhibit D80-23-2
Exhibit D80-23-3
Transcript Vol. 8 (generally)

4.1 Impacts on Haisla Nation Territory from the Pipeline Itself

1054. The proposed pipelines will require the use of 467.5 ha of land from Haisla Nation Territory over which the Haisla Nation asserts aboriginal title. This will require the alienation of Haisla Nation aboriginal title lands and will put them to a use that is inconsistent with Haisla Nation stewardship obligations and inconsistent with the use the Haisla Nation would choose for these lands.

1055. NG has not assessed the impacts of the proposed project on Haisla Nation aboriginal title. NG has not included in its discussion of land requirements and land rights and acquisitions a discussion of the Haisla Nation as an aboriginal title holder who would be impacted by the use of lands for the proposed project.

Mr. Green, Transcript Vol. 114, line 12741
Exhibit B1-3, pp. 17-20
Exhibit B39-3, p. 114

1056. Further, and while this is not in evidence because it transpired recently, the Haisla Nation is a landowner of two parcels along the west side of Kitimat Arm (District Lots 99 and 309) through which the proposed project will pass. The Haisla Nation will therefore be impacted not only as an Aboriginal group that asserts aboriginal title to a large portion of the land NG proposes to use for the proposed project, the Haisla Nation will also be impacted as an Aboriginal group who holds the fee simple title to some of the lands required for the proposed project, lands to which it also asserts aboriginal title.

1057. The Haisla Nation relies on the lands, water, and resources of Haisla Nation Territory in the exercise of its aboriginal rights. The aboriginal rights exercised in the PDA and PEAA for the pipeline consists of:

- Hunting and trapping of a broad range of species, including but not limited to: moose, deer, black bears, grizzly bears, mountain goats, marten, mink, fox, otters, weasels, marmots, squirrels, wolf, geese, ducks, grouse, and seals.

- Fishing of a broad range of species, including but not limited to: coho salmon, dog salmon, chum salmon, spring salmon, pink salmon, steelhead, humpies, herring, red cod, grey cod, eulachon, mussels, cockles, crabs, octopus, and prawns.

- Harvesting and gathering of a broad range of species, including but not limited to: blueberries, salmonberries, huckleberries, raspberries, strawberries, gooseberries, crab apples, rose hips, fern roots, clover roots, buttercup roots, alder bark, fireweed, cattails, large cedar, cedar bark, spruce pitch, spruce roots, hemlock bark, wild rice, hellebore, devil's club, cow parsnips, wild rhubarb and nettles.

Exhibit D80-22-4, pp. 36-58
Exhibits D80-23-2 and D80-23-3

1058. NG's ESA has been framed in terms of potential adverse effects based on spatial scoping that does not take into consideration the areal extent of Haisla Nation Territory. The PDA area and PEAA areas have not been contextualized in terms of Haisla Nation Territory. The effects assessment does not disclose the extent of potential effects in Haisla Nation Territory.

1059. The Coast Mountain Physiographic Region, which runs from KP 1075 to KP 1177.62 (Route Revision V) is the closest proxy for Haisla Nation Territory (KP 1092 to KP 1177.62). The potential impacts in the Coast Mountain Physiographic Region are considerable and disproportionately high. As set out above, 28% of the geohazard sites, 27% of the mass wasting sites, 18% of the ecosystem disturbance, 34% of the old growth forest disturbance, 66% of the rare ecological communities disturbance, 5% of the wetlands disturbance, 20% of timber resource disturbance, 15% of the watercourse crossings, and 18% of the freshwater HADDs will occur in Haisla Nation Territory.

1060. NG's ESA is neither transparent nor reliable with respect to the determination of significance of adverse environmental effects that cannot be mitigated. The ESA suffers from significant information gaps, false conservatism, and unreliable information about the degree and extent of effects. Further, the ESA seeks to rely on future studies to identify mitigation which will reduce the level of effects so that they are no longer significant. Finally, the ESA does not fully assess the effects of the project on Aboriginal groups and therefore does not address the components of effects required by *CEAA 2012*, the *NEB Filing Manual*, the *JRP Agreement*, and the *Scope of Factors*.

1061. NG has not demonstrated that the adverse environmental effects for the proposed project are not likely to have significant effects on Haisla Nation traditional use, health, or cultural heritage.

1062. Further, NG's assessment does not look at all impacts in the context of the Coast Mountain Physiographic Region or some other proxy for Haisla Nation Territory, so it has not demonstrated that the project is not likely to result in significant adverse effects in Haisla Nation Territory.

4.2 Effects of Accident or Malfunction on Haisla Nation

1063. Concerns of the Haisla Nation regarding potential effects of a hydrocarbon spill on current use of lands and resources for traditional purposes are valid.

Exhibit B39-3, p. 52

1064. NG has not demonstrated that a spill of oil into the Kitimat River will not happen. Such a spill of oil into the Kitimat River would have significant adverse effects on the lands, waters and resources relied on by the Haisla Nation. These adverse effects include adverse effects on the Haisla Nation's ability to use its lands, waters and resources, potential adverse effects on the health of Haisla Nation members, adverse effects on their ability to Haisla Nation members to exercise their aboriginal rights, and adverse effects on Haisla Nation cultural heritage.

4.2.1 Effects of Accident or Malfunction on Haisla Nation Traditional Use

1065. A spill of oil in the Kitimat River Valley is highly likely to enter the Kitimat River and travel down the river all the way to the Estuary. NG has demonstrated this likelihood in its *EHHRA*.

Exhibit B80-3, pp. 61-63

1066. NG has also confirmed that a large oil spill in the Kitimat River Valley would have significant adverse effects that cannot be mitigated.

1067. Haisla Nation members rely on the Kitimat River and Kitimat River Valley in the exercise of their aboriginal rights, as set out at paras. 159 to 165 and para. 1057 above.

1068. The Kitimat River has been historically impacted by a number of industrial projects, but the Haisla Nation has been working tirelessly to restore its habitat quality and ensure that it remains capable of supporting eulachon, salmon, and other fish and aquatic species in the long-term. A significant spill into the Kitimat River could have devastating impacts on the river and on its ability to support eulachon, salmon, and other fish and aquatic species.

Affidavit of Chief Councillor Ellis Ross, Exhibit D80-24-2, pp. 6-17, paras. 20-60

1069. A spill into the Kitimat River would also eventually reach the Kitimat River Estuary, a highly sensitive area that also plays a major role in Haisla Nation traditional use. The ability and willingness to continue traditional use practices in an area fouled with oil would be severely impaired.

4.2.2 Effects of Accident or Malfunction on Health of Haisla Nation Members

1070. Haisla Nation members are at risk of both direct and indirect health impacts as a result of a spill. In terms of direct impacts, the potential adverse health effects from acute exposure due to inhalation may warrant an evacuation. NG has not demonstrated that this can be effectively achieved.

1071. For longer term effects, NG's *EHHRA* suggests that there will be no adverse human health effects associated with a spill. For the reasons set out above, however, the *EHHRA* is not a reliable predictor of effects.

1072. Further, Haisla Nation members rely heavily on traditional foods, including fish from the Kitimat River. The ability to access country foods is critical to the health of Haisla Nation members. The Haisla Nation food fishery contributes to the well-being and cultural continuity of the Haisla far beyond the market value of the fish.

Affidavit of Michael Jacobs, D80-23-1, p. 5

1073. Haisla Nation members rely on country foods for their health and well-being.

Exhibit D80-23-2 (generally)
Exhibit D80-23-3 (generally)

1074. Haisla Nation members under their diets and the consumption of country food to be directly associated with their health and well-being:

> My diet consists of mainly seafood, so if I was to lose this source of diet, I believe that my wellbeing would deteriorate because my body is used to traditional foods.
>
> *Exhibit D80-23-3, Affidavit of Mary Muriel Green, p. 23, para. 9*
>
> I live off the land as much as I can because with the diet we now have today which was introduced to us from first contact, we as a family are now suffering from Diabetes, Rheumatoid Arthritis, Cancer and so on.
>
> *Exhibit D80-23-3, Affidavit of Trevor Amos, p. 67, para. 8*

1075. A spill of oil or condensate into the Kitimat River has the potential to result in both direct and indirect impacts on the health of Haisla Nation members. NG's application has only considered the direct health impacts, and has not taken into consideration the health impacts that can flow from being deprived of a traditional diet or the ability to engage in traditional practices.

Mr. Yee, Transcript Vol. 139, lines 10572-10577

1076. A spill could result in the disruption of subsistence fishing and harvesting and could cause the Haisla Nation community to turn to store bought foods. Traditional foods are important culturally, nutritionally, taste-wise and socio-economically. Yet NG has ignored this potential pathway of effect, and has done no studies to assess the effects of avoidance of the disruption of a traditional food diet on the Haisla Nation or on other aboriginal groups at a health or at a cultural level.

Mr. McHugh, Transcript Vol. 140, lines 11004-11006
Mr. Carruthers, Transcript Vol. 140, lines 11022-11024
Mr. Wooley, Transcript Vol. 140, lines 11070-11071

1077. Assurances from a human health risk assessment conducted by NG cannot allay concerns that the aquatic ecosystem will have been fouled to such an extent that the fish and shellfish are no longer safe to eat, with potential long-term health effects associated with avoidance of traditional foods.

4.3 Impacts on Haisla Nation Cultural Heritage

1078. To the extent that the Haisla Nation will be prevented from exercising its aboriginal rights as it did before, the Haisla Nation will be impacted by the proposed project, whether they are deemed significant pursuant to NG's assessment under *CEAA 2012* or not. The Haisla Nation has demonstrated through the evidence, and has asked the Panel to find, that the proposed project is likely to result in significant adverse effects.

1079. NG has asserted that the proposed project will not result in significant adverse environmental effects to terrestrial or marine biota and the ecosystems they rely on, and has, on that basis, concluded that the proposed project is not likely to result in significant adverse effects to current use of lands and resources for traditional purposes.

Exhibit B39-3, p. 50

1080. NG has not provided any evidence to demonstrate that the proposed project will not result in significant adverse effects to Haisla Nation cultural heritage.

1081. A conclusion that the proposed project will not result in a significant adverse effect on current use of lands and resources for traditional purposes on the basis of the information supporting and the approach taken in NG's application is not a conclusion that the proposed project will not have a significant adverse effect on Haisla Nation cultural heritage or on Haisla Nation aboriginal rights and title.

1082. The use of land and resources must be considered from the Haisla Nation's perspective. The Haisla Nation has set out the extent to which the Haisla Nation relies on the lands, water, and resources of its Territory and how that relates to Haisla Nation cultural heritage. To the extent that the Haisla Nation is prevented from accessing its lands, water, and resources in a manner that fosters the continued health of Haisla Nation cultural heritage, this will be a significant adverse effect.

1083. Haisla Nation cultural heritage includes the concept of *nusa*, teaching by doing. This is a fundamental aspect of the way in which Haisla Nation culture and identity is transmitted from one generation to the next. If Haisla Nation cultural heritage is to be preserved, Haisla Nation members must be able to take resources from the places they always have, so that they can teach the next generation of Haislas where these places are, when they are used, how they are used, and why they are used. If Haisla Nation cultural heritage is to be preserved, Haisla Nation members must be able to process these freshly taken resources with the next generation of Haislas, so they can teach them how to process them, how to store, when to use them and why things are done the way they are.

1084. Further, even if the impacts from the proposed project were found to not be significant pursuant to a *CEAA 2012* analysis, they will impact Haisla Nation exercise of aboriginal rights and Haisla Nation cultural heritage in an adverse way.

1085. A spill into the Kitimat River will result in acute toxicity and fish morality. A spill in the wrong place at the wrong time may result in mortality of spawning eulachon with the effect of extirpating the Kitimat River population.

Exhibit D80-27-5, pp. 3 and 46-48

1086. The eulachon is a Haisla Nation cultural icon. It is the first fish to return to Haisla Nation waters to spawn after the winter, and the Haisla Nation seasonal harvest calendar starts with the eulachon. The re-establishment of the eulachon runs in the Kitimat River and in other Haisla eulachon streams is a high priority for the Haisla Nation.

Affidavit of Michael Jacobs, Exhibit D80-23-1, p. 2, paras. 5-7

1087. The fragility of the Kitimat River eulachon populations must be considered in assessing the adverse effects associated with the project, their significance, and mitigation.[157] NG has acknowledged that adverse environmental effects of projects may be significant if they occur in areas or regions that have adversely affected by human activities and/or

[157] *CEAA: A Reference Guide for Significance, supra.*

are ecologically fragile and have little resilience to imposed stresses. NG has also acknowledged the fragility of the Kitimat River eulachon population.

Mr. Green, Transcript Vol. 102, lines 27077-27079
Mr. Watson, Transcript Vol. 112, line 9570
Mr. Anderson, Transcript Vol. 113, lines 12544-12547
Mr. Anderson, Transcript Vol. 114, lines 12809-12820

1088. The Haisla Nation also relies on the Kitimat River Valley and Kitimat River Estuary for a number of other traditional practices, including:

- Hunting and trapping of a number of species, including but not limited to: moose, deer, black bears, grizzly bears, mountain goats, marten, mink, fox, otters, weasels, marmots, squirrels, wolf, geese, ducks and grouse.

- Fishing of a number of species, including but not limited to: coho salmon, dog salmon, chum salmon, spring salmon, pink salmon, steelhead humpies, herring, halibut, red cod, grey cod, eulachon, mussels, cockles, crabs, octopus, prawns and seals.

- Harvesting and gathering of a number of species, including but not limited to: blueberries, salmonberries, huckleberries, raspberries, strawberries, gooseberries, crab apples, rose hips, fern roots, clover roots, buttercup roots, alder bark, fireweed, cattails, large cedar, cedar bark, spruce pitch, spruce roots, hemlock bark, wild rice, hellebore, devil's club, cow parsnips, wild rhubarb and nettles.

Exhibit D80-22-4, pp. 36-58
Exhibits D80-23-2 and D80-23-3

1089. To the extent that the Haisla Nation is prevented from accessing its lands, water, and resources in a manner that fosters the continued health of Haisla Nation cultural heritage, this will be a significant adverse environmental effect.

5. NG's Pipelines are Likely to Result in Significant Adverse Effects that Cannot be Justified

1090. The Panel ought to make a determination that the proposed pipelines will result in significant adverse environmental effects.

1091. NG has not done enough work to be able to determine that an accident or malfunction will not result in significant adverse effects. NG seeks to rely on the likelihood of an accident or malfunction being low, on mitigation that reduces the potential spill amounts, on a quick and effective spill response, on an absence of chronic toxicity impacts, and on the recovery of the biophysical environment.

1092. As set out above, these bases are relied upon falsely by NG in reaching the non-significance determination:

- NG has not done enough work to assess and determine that it can address geotechnical risk in the Kitimat River Valley, undermining their spill likelihood assessment;

- NG is relying on a risk management approach that does not reflect the full extent of risk and that does not consider public concerns regarding risk;
- NG is relying on spill detection methods that are prone to human error or that entail delays in detection which can result in significant spills volumes;
- NG has not demonstrated that it can evacuate Haisla Nation members in a timely and safe manner if required;
- NG has not demonstrated that it will be capable of responding quickly and effectively to a spill in the Kitimat River valley;
- NG has not demonstrated the existence of tools or methods to contain a spill of oil or condensate in a fast flowing river like the Kitimat River;
- NG has not demonstrated the existence of methods for locating and recovering sunken or submerged oils that will not also damage sensitive spawning habitat;
- NG has underestimated the chronic toxicity of oil to fish; and
- NG's evidence regarding the recovery of the biophysical environment is not an accurate predictor for the Kitimat River or the Kitimat River Estuary.

1093. Further, even on the basis of the work that NG has done, the Haisla Nation will be heavily impacted if there is a spill of oil from the proposed pipelines in its Territory. The spill will move into the Kitimat River so fast that acute toxicity effects are bound to occur.

1094. As a result, the Panel does not have enough information to reasonably conclude that an accident or malfunction from the proposed pipelines will not result in significant adverse effects. The Panel should find that the proposed project is likely to result in significant adverse effects to the environment, including to the health and socio-economic conditions, the cultural heritage, and the current use of lands and resources for traditional purposes by the Haisla Nation.

1095. **Finding Requested: The Panel should conclude that these significant adverse environmental effects from the proposed pipelines cannot be justified due to the profound impact they would have on the Haisla Nation, on Haisla Nation Territory, and on Haisla Nation cultural heritage.**

V. ENVIRONMENTAL EFFECTS OF THE PROPOSED KITIMAT TERMINAL

1096. The legal context for the assessment of the environmental effects of the proposed Kitimat Terminal is set out at paras. 528 to 628 above. The proposed project includes the construction and operation of a tank terminal and marine tanker terminal on the west side of Kitimat Arm, across the Arm from the Haisla Nation's Kitamaat IR No. 2.

1097. The construction and routine operations of the proposed tank terminal and marine terminal are anticipated to result in significant adverse environmental effects and significant adverse impacts to Haisla Nation aboriginal rights and title. The analysis in NG's ESA addresses environmental effects and significance of those effects pursuant to an assessment under *CEAA 2012* and concludes that construction and routine operations will not result in significant adverse effects. The Haisla Nation disagrees with this conclusion.

Exhibit B3-11, p. 120

1098. NG's assessment of the effects of construction and routine operations of the tank terminal and marine terminal is based on information that suffers from significant information gaps, relies on false conservatism, double-counting of mitigation, and unreliable information, and has not incorporated the aboriginal perspective.

1099. Further, NG acknowledges that if an accident or malfunction occurs at the marine terminal, it is likely to cause widespread and significant adverse environmental effects, but seeks to downplay the effects and duration of these effects. NG states that the likelihood of a spill is low and that spill response and recovery will reverse the adverse effects of a spill in time. The Haisla Nation submits that NG's application does not support a conclusion that spill risk is low, that spill response will be effective or that recovery will occur. The adverse effects of a spill from the proposed Kitimat Terminal will therefore be significant.

Exhibit B3-22, pp. 13, 92 and 144

1100. Finally, whether or not the effects of the proposed project result in significant impacts to Haisla Nation aboriginal rights and title requires a different assessment than that required under *CEAA 2012*. This portion of the argument will first address the environmental effects under a *CEAA 2012* analysis, and then contextualize them in terms of impacts to the Haisla Nation.

1. Effects of Construction and Routine Operations

1101. The construction and operations of both the terrestrial and the marine portions of the proposed Kitimat Terminal will have adverse effects on the environment. As with the proposed pipeline ROWs, these impacts will occur.

Mr. Green, Transcript Vol. 102, line 27133

1.1 Tank Terminal Will Disturb Vegetation, Wildlife and Fish Habitat

1102. The construction and routine operations of the tank terminal, the terrestrial portion of the terminal, will require clearing, blasting, excavation and grading, so that

infrastructure can be installed on the surface of the land. This infrastructure terminal will remain in place for the duration of the proposed project.

1.1.1 Footprint Impacts

1103. The construction and operation of the marine terminal will have the following certain effects in Haisla Nation Territory:

- Construction of the terminal will require blasting, excavation, and stock piling of material which will cause destruction of fish habitat, noise disturbance to wildlife, loss of vegetation, and potential acid rock drainage with water quality implications for Kitimat Arm.

  Exhibit B3-1, p. 42

- The clearing of vegetation for the construction of the marine terminal will require the destruction of hundreds if not thousands of Haisla Nation CMTs, some of which predate 1846 and are protected under the *BC Cultural Heritage Conservation Act*, and some of which post-date 1846 but are nevertheless important living monuments to Haisla Nation history and culture.

  Exhibit B3-1, p. 41
  Mr. Green, Transcript Vol. 113, line 12412

- The terrestrial portions of the terminal will occupy an area of 220 hectares within a security fence and 258 hectares outside a security fence, resulting in the taking up of a total of 478 hectares of Haisla Nation aboriginal title lands.

  Exhibit B3-1, p. 35

- The construction of the terminal will result in excess cut material which will smother approximately 33.5 ha of vegetation.

  Mr. Green, Transcript Vol. 113, lines 12368-12372
  Exhibit B179-1, NGP Response to Undertaking U64

- The proposed marine terminal is located in the heart of Haisla Nation Territory, across Kitimat Arm from the main Haisla residential community at Kitamaat IR No. 2. The terminal will be visible from Kitamaat IR No. 2. The impacts will, therefore, be very direct and real for the Haisla Nation and the direct view from Kitamaat IR No. 2 will serve as a constant reminder of the project and of its threat to the Haisla way of life.

  Exhibit B3-18, p. 52

1.1.2 Destruction of Haisla Nation Culturally Modified Trees

1104. The construction of the proposed tank terminal will require the destruction of Haisla Nation CMT's. The area proposed to be used for the Kitimat Terminal contains hundreds,

if not thousands, of Haisla Nation CMTs. In addition, NG has agreed that the riparian vegetation which must be removed for the construction of the marine portion of the terminal may include additional CMTs. Many of these predate 1846, providing a solid foundation for the Haisla Nation's aboriginal title claim to this area. Additional detail about these CMTs is set out in paras. 136 to 139, above.

1105. NG is already responsible for the illegal destruction of Haisla Nation CMTs at the proposed terminal site during pre-application exploration work. The Haisla Nation and NG have reached an agreement with respect to this damage, but the Haisla Nation has not condoned this illegal destruction of Haisla Nation cultural resources.

Exhibit B2-26, p. 191
Exhibit B39-3, pp. 60-61

1106. NG's ESA concludes that the destruction of Haisla Nation CMTs does not amount to a significant adverse effect that cannot be mitigated. NG's proposed mitigation entails dating the trees through core samples and then seeking required approvals under provincial legislation or following standard industry practice. This is not mitigation in the eyes of the Haisla Nation.

Exhibit B165-3, p. 12, Commitment EV-02-13
Exhibit D80-50-2, p. 12
Exhibit D80-92-5, pp. 14-15

1107. The Panel has proposed a potential condition aimed at the protection and management of post-1846 CMTs, requiring NG to file a plan to protect and manage post-AD 1846 CMTs within the British Columbia portion of the proposed project prior to construction. This potential condition will require surveying and inventorying, proposed mitigation measures to reduce or eliminate impacts, and a summary of consultation with potentially-affected Aboriginal groups regarding the protection and management plan. Presumably the Panel is relying on the British Columbia *Heritage Conservation Act* to address any pre-1846 CMTs.

1108. This condition appears to condone the destruction of the CMTs at the proposed terminal site, prior to any meaningful consultation with the Haisla Nation about this. The value of CMTs is broader than the evidentiary basis they provide for establishing use and occupation. They are living monuments to culture and history. The CMTs at the proposed terminal site are living monuments to Haisla Nation culture and history. To the extent that the potential condition condones the destruction of the CMTs at the proposed terminal site, it is inadequate to protect the Haisla Nation's interests and cannot be viewed as mitigation.

Mr. Buchanan, Transcript Vol. 104, line 29713
Mr. Anderson, Transcript Vol. 104, line 29716

1109. To the extent that other CMTs are found once the pipeline ROW or the marine riparian vegetation at terminal site is actually surveyed, these concerns would apply to those CMTs as well.

1110. **Finding Requested: The Panel should find that the scale of the destruction of Haisla Nation CMTs at the proposed terminal site will result in significant adverse environmental effects on Haisla Nation cultural heritage and on Haisla Nation historical, archaeological and paleontological sites.**

1.1.3 Haisla Rock Art at Risk

1111. There are two rock art sites in the vicinity of the proposed terminal, both pre-contact pictographs. Borden Site FlTe 5 consists of red ochre pictographs of 12 to 14 human figures, a face, a copper and some dots painted on a large rock face. FlTe7, also pictograph, depicts a sun above a curved line, possibly a canoe.[158]

1112. Haisla Nation oral history attributes FlTe5 to a Haisla warrior artist to commemorate an early foiled Haida raid, where the raiders were captured and forced to canoe past the rock, known as *Hentlixw*, and shoot all their arrows at the face of the rock.

Exhibit B3-18, p. 133

1113. NG has acknowledged that the Haisla rock art sites at Borden sites FlTe 5 and FlTe7 are in the immediate vicinity of the proposed terminal site and are at risk of being damaged as a result of the proposed project. FlTe 7 is actually within the terminal site. The ESA anticipates that emissions from the terminal and increased access to the area could result in these Haisla Nation archaeological sites becoming damaged.

Exhibit B3-18, p. 140

1.1.4 Degree and Extent of Effects on Human Environment – Viewsheds

1114. In its application, NG has assessed the effects of the proposed project on the visual landscape, has identified that the proposed terminal will be visible from Kitamaat Village, and identifies Kitamaat Village residents as the key population that will be affected by visual effects from the project. NG nevertheless has stated that the adverse effects on viewsheds will not be significant.

Exhibit B3-18, pp. 52 and 60

1115. In the ESA, NG characterized the viewshed impacts from Kitimat IR No. 2 as follows:

> The residents of Kitimaat Village experience a direct effect, as they have a direct view of the Kitimat Terminal.

Exhibit B3-18, p. 60

1116. NG has concluded that there will be effects on Kitamaat Village residents, but that these effects will be mitigated over a period of 30 years by tree growth. This 30-year period is

[158] Detail about these sites is found in the following reports which are in the possession of British Columbia Archaeology Branch: 1984-019 (FlTd-5,7) Rock art HIP rpt, 1995-0127 (FlTe-5,7,9,10) AIA HIP rpt, and 2007-335 (FlTe-7,33,37) Post Impact Assessment report.

no longer valid, given the increase in tank height which is now evident in NG's application.

Exhibit B3-18, p. 52

1117. In December of 2012, NG filed a revised tank terminal layout, which includes an increase in the number of tanks as well as an increase in tank height. The tanks will increase in height to 24.2 m, which is 6.4 m higher than the 18 m for the ESA tank height used in the visual viewsheds assessment.

Exhibit B3-18, p. 49
Exhibit B182-2, p. 15

1118. NG has not fully assessed the extent to which the increase in tank height will increase the height above sea level of the tank tops, but confirms that it will result in an increase consisting of some portion of the 6.4 m increase in tank height. Despite this, NG has concluded that the additional height of the tanks at the Kitimat Terminal is not expected to alter overall visibility of the terminal, and is therefore not expected to impact visual or aesthetic resources.

Mr. Doering, Transcript Vol. 146, line 19208
Exhibit B182-2, p. 25

1119. NG's conclusion is really just an assertion. The conclusion that the increased tank height will not alter overall visibility of the marine terminal is not supported by any analysis examining increases in height or three-dimensional modelling. Further, NG has provided no basis for concluding that visual impacts at Kitamaat IR No. 2 will not change.

1120. Oral questioning has revealed that the site layout design for the tank terminal is still under consideration and that there is work being done to revise grading. NG could not, however, explain how the grading would be accomplished to prevent an increase in tank height above sea level without not also contributing to increased excavation and excess cut disposal. NG further stated that the assessment of whether the new tank configuration would change the significance assessment was based on an assessment of the footprint area.

Mr. Doering, Transcript Vol. 146, lines 19176-19191
Mr. Anderson, Transcript Vol. 146, line 19193

1121. The evidence therefore indicates that the increase in tank height and effects on viewsheds has not, in fact, been considered and assessed. Further, the viewshed from Kitamaat IR No. 2 may in fact change significantly without amounting to a change that is deemed significant in the context of the PEAA or PDA levels of significance established by NG for its assessment of effects on visual and aesthetic resources. Whether this change will result in an increase in viewshed effects at Kitamaat IR No. 2 such that they are not significant has not been assessed.

1.1.5 Haisla Nation Aboriginal Rights and Title

1122. The construction and operation of the marine terminal will require the alienation of Haisla Nation aboriginal title lands and will put them to a use that is inconsistent with Haisla Nation stewardship obligations and inconsistent with the use the Haisla Nation would choose for these lands.

1123. NG has not assessed the impacts of the proposed project on Haisla Nation aboriginal title. NG has not included in its discussion of land requirements and land rights and acquisitions a discussion of the Haisla Nation as an aboriginal title holder who would be impacted by the use of lands for the proposed project.

Mr. Green, Transcript Vol. 114, line 12741
Exhibit B1-3, pp. 17-20
Exhibit B39-3, p. 114

1124. The Haisla Nation has provided evidence of and legal support for the conclusion that the Haisla Nation has an extremely high strength of claim to aboriginal title to the proposed Kitimat Terminal site (see paras. 115 to 171, above).

1125. NG is proposing to use these lands for a purpose and in a manner that is fundamentally incompatible with Haisla Nation stewardship for its lands, water and resources, and that presents a significant risk to Haisla Nation cultural heritage and that in effect expropriates the inescapable economic aspect of Haisla Nation aboriginal title to the lands.

1.2 Marine Terminal

1126. The nature of the environmental effects that will result from the construction of the marine terminal cannot be reasonably assessed because NG has failed to provide an adequate amount of information for this assessment. NG has failed to conduct the necessary surveys of marine riparian vegetation and fish and fish habitat.

1.2.1 Footprint Impacts

1127. The marine portion of the proposed Kitimat Terminal will also have direct physical impacts on Haisla Nation Territory:

- Clearing and infrastructure along the foreshore will result in the disturbance of up to 1000 m of marine riparian vegetation.

  Exhibit B3-1, p. 41

- Construction for the marine portion of the terminal will require blasting of approximately 25,000 m^3 of rock, mostly at a depth of 10 to 32 m possibly shallower. The construction of the marine portion of the terminal will require dredging of approximately 30,000 m^3 of sediment.

  Exhibit B3-12, p. 30 and 31

- Overall, the construction of the marine terminal is estimated to result in 18,339 m^2 of lost marine riparian vegetation.

  Exhibit B3-12, pp. 29 and 195

- NG has identified a total potential HADD of 38,518m^2 at the Marine Terminal. This includes effects on the subtidal, intertidal and marine riparian vegetation habitats. Within the subtidal and intertidal habitats, NG has incorrectly characterized the majority of the HADD as alterations and not destruction. NG reasons that "although organisms currently inhabiting the work area will be lost, the exposed bedrock will be available for colonization as soon as the physical works are completed." This logic is faulty as it asserts that what remains after destruction of habitat is actually merely an alteration. The total potential HADD of 38,518m^2 must be contemplated in the marine habitat compensation plan.

  Exhibit B80-14, p. 19

1.2.2 Information Gaps - Failure to Provide Information Required by *Scope of Factors*

1128. The *Scope of Factors* sets out requirements for the baseline information required for both the terrestrial and marine components of the proposed project. As set out above (paras. 591 to 605), the *Scope of Factors* is binding on the Panel and sets out information that is **required to be provided to and considered** by the Panel.

  Exhibit D122-3-13, pp. 4 and 10

1129. The *Scope of Factors* includes a requirement to provide baseline information, including, *inter alia*:

- the identification, description and mapping of marine habitats, including habitat type, location and range, habitat suitability, diversity, abundance and sensitive aquatic habitat;

- the identification of and relative predominance of aquatic vegetation;

- a **description of marine habitat use and species presence, including population status, life cycle, sensitive periods, habitat requirements for each life stage, abundance (local and regional), distribution and use of habitat type, and for anadromous species, the seasonal range, migration patterns, and sensitivity to disturbance**.

1130. In areas of proposed marine infrastructure, this baseline information is also to include, *inter alia*:

- a description of the subtidal and intertidal habitat and communities, including a detailed underwater mapping of the subtidal benthic habitat; and

- a description of the deeper subtidal and benthic invertebrate community, including species abundance, richness and diversity.

  Exhibit D122-3-13, pp. 10-11

1131. The *Scope of Factors* also sets out the level of detail that is required with respect to fish habitat compensation plans.

> The proponent shall present a compensation program for losses in fish habitat that complies with Fisheries and Oceans Canada's (DFO) policies. The compensation plan should generally include the following elements:
>
> - **Detailed descriptions of the fish habitat** impacted (i.e. amount, type, species present, productivity). …

Exhibit D122-3-13, pp. 18

1132. NG has failed to meet the information requirements set out in the *Scope of Factors* with respect to baseline information and impacts to fish habitat at the marine terminal.

1.2.2.1 Lack of Adequate Information about Marine Riparian Vegetation

1133. NG has not performed the surveys necessary to assess the impacts to marine riparian vegetation.

1134. NG has concluded that clearing and infrastructure along the foreshore will result in the disturbance of up to 1,000 m of marine riparian vegetation, and that the preparation of the marine terminal site and the installation of associated infrastructure will result in the loss of up to 30,000 m^2 of marine riparian vegetation and approximately 2,400 m^2 of suitable habitat for marine algal species such as rockweed. These project effects are certain.

Exhibit B3-12, p. 29
Exhibit B3-12, p. 195

1135. **NG has only a moderate confidence in its prediction** of not significant for residual effects from changes in marine vegetation habitat for marine riparian vegetation. This moderate prediction confidence is arrived at despite the fact that not much is known about the current availability and status of marine riparian vegetation in the region, because project effects are certain.

Exhibit B3-12, p. 196

1136. The lack of information about current availability and status of marine riparian vegetation is a result of NG's failure to do complete surveys for the PEAA:

> **12438.** The marine surveys focused on the marine habitat so it -- we don't have field data specifically for the marine riparian zone.
> **12439. MS. GRIFFITH:** And just to confirm the -- we discussed the or you referred to the extent of the field surveys that would have been required to assess the shoreline of the Regional Effects Assessment Area but, really, additional fieldwork to assess the shoreline of the Project Effects Assessment Area, which is significantly shorter in terms of shoreline length, would not have been unreasonable; would it?
> --- (A short pause/Courte pause)

> **12440. MR. JEFFREY GREEN:** So, no, our surveys were focused on the PDA. We didn't do the complete surveys for the Project Effects Assessment Area.
> **12441. MS. GRIFFITH:** And wouldn't it have been reasonable to do those surveys so that you could get a higher prediction confidence than moderate?
> **12442. MR. JEFFREY GREEN:** I think it's fair to say that I'm not sure why they weren't done but, yes, I think it would have improved the prediction confidence.
> …
> **12444.** While fish may not be in the habitat, it provides shading and a variety of other values. So the intent is to do detailed assessments before and after the -- so before any construction starts on the site, we would be looking at the actual finalized footprint of the Marine Terminal, including the land based components and calculating -- determining what the habitat is.
>
> *Mr. Green, Transcript Vol. 113, lines 12438-12444*

1137. NG has not conducted sampling of marine riparian vegetation. As a result, NG cannot pretend to make any determination of significance of adverse effects.

1.2.2.2 NG Has Not Conducted Adequate Fish Surveys at the Marine Terminal

1138. NG has not conducted adequate baseline field surveys to identify which species of fish use the waters adjacent to the marine terminal at what times of the year. NG's surveys consist of two surveys conducted in the late summer of 2005.

> *Exhibit B9-25, pp. 31-32*
> *Mr. Green, Transcript vol. 113, line 12481*

1139. NG intends to conduct additional baseline studies pursuant to its proposed Marine Environmental Effects Monitoring Program (MEEMP). These studies will not be conducted until after the proposed project has been approved.

> *Mr. Green, Transcript Vol. 113, lines 12511-12518*

1140. As a result, NG cannot say with any certainty what species and life stages are at risk from construction and routine operations at the terminal or from an accident associated with the construction or operation of the marine terminal. Further, NG cannot say with any certainty what species and life stages are at risk in the event of a release or spill at the marine terminal. NG has not conducted surveys or presented information on diversity and abundance of species, or quantified habitat or the environmental quality of habitat at the marine terminal.

> *Mr. Green, Transcript Vol. 113, lines 12514-13516*

1141. NG has failed to meet the filing requirements set out in the *Scope of Factors* for the proposed project. NG has not provided a description of marine habitat use and fish species presence, including population status, lifecycles, sensitive periods, habitat requirements for each life stage, or migration patterns for fish in the marine terminal PDA. Specifically, NG has not conducted field studies except in the late summer of 2005, and not conducted habitat base studies, and has not conducted baseline surveys to

determine herring spawning areas, or movement patterns for eulachon. NG has not conducted any field studies during the proposed work windows for the marine terminal site. This is information identified in the *Scope of Factors* as required baseline information.

Mr. Green, Transcript Vol. 113, lines 12509-12512
Mr. Anderson, Transcript Vol. 113, lines 12532-12542
Mr. Anderson, Transcript Vol. 113, lines 12619-12639

1142. NG has agreed that it does not have enough information for spill response planning or construction effects monitoring, but states that it has provided enough information for the assessment stage of the project.

Mr. Green, Transcript Vol. 113, lines 12507

1143. The Haisla Nation disagrees that the information that has been provided is adequate to assess the proposed project. The lack of baseline information prevented NG from proving clear or useful answers to questions about work timing windows to protect fish from construction impacts.

Transcript Vol. 113, lines 12640-12667

1144. NG intends to conduct additional surveys as part of its proposed MEEMP. NG has provided the following characterization of the MEEMP:

> **12574**. **MR. PAUL ANDERSON:** The purpose of the marine environmental effects monitoring program is to help refine our project in respect of mitigation, timing for least risk periods and for obtaining pre-construction baseline information for the purposes of a follow-up program under CEAA.
> **12575.** It reflects the moderate level of certainty that we had in terms of our predictions and it will help us to determine the effectiveness of our mitigation.

Mr. Anderson, Transcript Vol. 113, lines 12574-12575

1145. NG's failure to meet the filing requirements for fish and fish habitat at the marine terminal, as detailed in the *Scope of Factors*, means the Panel does not have before it the information it needs to make a reasonable assessment of the potential adverse effects of the construction and routine operations of the marine terminal, potential mitigation, or significance.

1146. **Finding Requested: The Panel should recommend that additional baseline information is required about fish and fish habitat at the proposed marine terminal, as required by the *Scope of Factors* before a decision statement can be issued.**

1147. **Finding Requested: The Panel should find that NG has failed to provide the information required about baseline conditions at the proposed marine terminal site and that this prevents the Panel from determining that the proposed project is not likely to cause significant adverse environmental effects.**

1.2.2.3 NG's Marine Habitat Compensation Plan is Conceptual Only

1148. The Marine Habitat Compensation Plan that NG has submitted is conceptual, and also fails to meet the filing requirements set out in the *Scope of Factors*. NG has not provided a detailed description of fish habitat (including type, species present and productivity) which will be impacted.

Mr. Anderson, Transcript Vol. 116, lines 17135-17140

1149. The failure of NG's Conceptual Marine Fish Habitat Compensation Plan to provide the requisite detailed description of fish habitat is clearly demonstrated by the plan itself:

> … subtidal habitats within the PDA are presumably used in some capacity by migratory fish such as salmon, herring and eulachon. For example, Kitimat River supports large runs of chum, pink, sockeye, coho and chinook salmon. Some these fish pass through the PDA, either as adults bound for spawning habitats or juveniles bound for offshore waters. The **extent to which these and other harvested fish species use the subtidal habitat within the PDA is unknown**; the relatively low structural complexity and limited biotic diversity of this habitat suggests that its value as foraging and/or nursery habitat is limited.
>
> *Exhibit B80-14, p. 10*
>
> **Although not identified during the field surveys, juvenile fish such as salmon, herring and eulachon likely utilize intertidal habitats within the PDA.** Juvenile fish typically forage in shallow waters and migrate along shorelines, making use of microhabitats created by rocks and algae. For example, rockweed, with its gas filled bladders, provides a floating three-dimensional matrix for juvenile fish to forage and avoid predation. Rockweed and other intertidal algae also support a diverse community of microinvertebrates that juvenile fish prey upon.
>
> *Exhibit B80-14, p. 11*

1150. Further, NG has not taken steps to identify opportunities for compensation beyond describing three types of opportunities: subtidal reef creation, eelgrass transplants and freshwater habitat enhancement.

Exhibit B80-14, pp. 21-26

1151. Thus, in addition to failing to provide a detailed description of the fish habitat to be impacted, NG has failed to meet the following filing requirements set out in the *Scope of Factors* for the marine fish habitat compensation plan:

- A list of compensation options sufficient to ensure no net loss in the productive capacity of fish habitat (both **temporally** and physically);
- A description of the proposed fish habitat compensation (i.e. type, location, **quantity** and quality of habitat to be constructed);

- A description of how compensation is to be accomplished, including drawings, specifications and plans. These may be conceptual for the environmental assessment, but detailed designs would be required prior to DFO issuing any authorizations;
- Details regarding the **ability to construct** the proposed compensation (e.g. ownership of land, **technically feasible**);
- Locations of the proposed compensation sites, **including scaled map and geographic coordinates**;
- Where existing habitat is to be enhanced, the **intrinsic value of this habitat** must be considered when determining the amount of habitat gained through compensation.
- A description of any existing habitat in the area of the proposed compensation (i.e. **type, species present, productivity**) should be included;
- **Photographs** of existing conditions at the proposed compensation sites; and
- An **explanation of how the proposed compensation would offset impacts and result in no net loss** in the productive capacity of fish habitat;

Exhibit D122-3-13, p. 18

1152. Only one aspect of the compensation plan is identified in the *Scope of Factors* as required at a conceptual level only: the description of how compensation is to be accomplished, including drawings, specifications and plans. NGs whole plan, however, is conceptual. It is called *Conceptual Marine Fish Habitat Compensation Plan* and is confirmed to be conceptual in nature.

Exhibit B80-14, pp. 1 and 5

1153. Further, NG's plan is identified as having been prepared in response to federal government Information Request No. 2.8. NG has not only failed to meet the filing requirements set out in the *Scope of Factors*, it appears to have ignored the fish habitat compensation plan requirements altogether.

1154. **Finding Requested: The Panel should recommend that additional information is required about fish habitat compensation, as required by the *Scope of Factors* before a decision statement can be issued.**

1155. **Finding Requested: The Panel should find that NG has failed to provide the information required about fish habitat compensation for HADDs at the proposed marine terminal site and that this prevents the Panel from determining that the proposed project is not likely to cause significant adverse environmental effects.**

1.2.3 NG Has Not Adequately Assessed the Adverse Effects of Construction and Routine Operations

1.2.3.1 Key Indicator Species Not Representative of Potentially Affected Species

1156. In assessing the potential adverse effects from the construction and routine operations of the marine terminal, NG has relied on key indicator species. For fish, these are composed of eulachon, pacific herring, rockfish and chum salmon. Notably, NG relies on chum salmon as the key indicator for impacts of the marine terminal on all salmon species salmon.

Exhibit B3-12, p. 79
Ms. Ahrens, Transcript, Vol. 112, lines 9502-9503

1157. Chum salmon is just one of the five salmon species that inhabit the waters subject to the proposed project, and all five species have different life cycles. The other species are: coho, Chinook, sockeye and pink salmon.

Exhibit B3-12, pp. 41 and 87

1158. Environment Canada has raised the concern that the indicator species selected by NG for the Kitimat Terminal, the marine transportation, and the marine spills might not be fully representative of the guilds of species that are present in those areas and has instead recommended a more thorough community of species approach. Environment Canada has stated that if the indicator species that were selected weren't appropriate, then some of the potential impacts arising from either the routine operations or from a spill, might not show the actual impacts that might be seen on the other species.

Ms. Wilson (EC), Transcript Vol. 167, lines 17492-17495

1159. The five salmon species that inhabit the waters of the proposed project differ from chum salmon in a number of significant ways:

- All five species of salmon have different lifecycles relating to how rapidly fingerlings move out of the hatching area, where they are raised and when they return from the ocean. There are also differences in the strategies that young fry use once they've emerged from the eggs.

  Mr. Green, Transcript Vol. 112, line 9505
  Mr. Green, Transcript Vol. 113, line 12601

- Between the five salmon species, the fry behave differently, the adults behave differently and the migrations can be different.

  Mr. Green, Transcript. Vol. 113, line 12598

- Adult pink salmon are present in the marine terminal PDA in the spring. Out-migrating Chinook salmon are present in the marine terminal PDA in the summer from June onwards.

  Mr. Green, Transcript Vol. 113, line 12486

Dr. Watson, Transcript Vol. 113, line 12490

1160. Oral questioning also identified further key differences between chum salmon and the other four salmon species:

- the salmon species have different distributions;
- the salmon species have different temporal cycles, specifically as they relate to young fish;
- Chinook and coho, sockeye will spend some time in freshwater streams and lakes, eating freshwater invertebrates;
- pink and chum follow the river flow out to estuaries where they feed on small plankton; and
- the salmon species will be of different sizes and have different body weights when in the marine terminal area.

Mr. Green and Dr. Watson, Transcript Vol. 114, lines 12754-12766

1161. Chum salmon were selected as a key indicator because they are ubiquitous, and not because they are the most broadly representative of the salmon life cycles.

> **12752. MR. PAUL ANDERSON:** Chum salmon would be the key indicator for all of the pathways of effects that were analyzed. I think it's important to remember with any KI there's no perfect key indicator. Every species of, and in this case, salmon have their own life histories and lifecycles so there isn't one that will accurately reflect all salmon, and that's common with all key indicators.
> **12753**. You're trying to find the best on balance indicator to represent a species group or guild. And the fact that chum was the most ubiquitous of the species is one of the main reasons why it was selected.

Mr. Anderson and Mr. Green, Transcript Vol. 114, lines 12749-12754

1162. As a result, chum salmon cannot be considered an effective key indicator for other salmon species.

1163. Further, for the acoustic effects assessment, NG used Atlantic salmon, a species which is not endemic to the project area and lives in an ocean thousands of miles from the project area.

Mr. Hannay, Transcript Vol. 114, lines 12744-12746

1164. NG's reliance on chum salmon as a key indicator for all salmon species cannot provide assurance that the proposed project will not result on significant impacts to other salmon species from either construction and routine operations or from a spill.

1.2.3.2 Assessment of Effects of Dredging and Blasting Not Adequate

1165. NG's assessment of the effects of dredging relies on false conservatism, double dipping mitigation, and questionable significance assessment. Total suspended solid (TSS) concentration can have adverse effects on fish and other aquatic organisms. TSS can

affect fish eggs, larvae and adults by altering depth preference, reducing feeding rates, causing mechanical damage, and altering food webs.

Exhibit B3-12, pp. 141, 144-146
Exhibit B3-13, p . 27

1166. In its assessment of the effects of sedimentation from dredging at the marine terminal, NG used a 1% sediment loss rate as an input into its modelling of sedimentation effects. Studies of sedimentation loss rates suggest the loss rates range from 0.2% to 3%.

Exhibit B9-29, p. 18
Mr. Fissel, Transcript Vol. 114, line 12846

1167. In oral testimony, NG experts first described using 1% as a model input as "conservative".

Mr. Fissel, Transcript Vol. 114, line 12850

1168. After further questioning, NG described this input as "attainable", suggesting it is something NG will strive for. An "attainable" input assumption cannot be considered to be a "conservative assumption". This is a clear example of the false conservatism demonstrated by other aspects of NG's Application. Using the 3% upper bound of sediment loss described in the literature would have been a more conservative approach to sediment modelling.

Mr. Fissel, Transcript Vol. 114, line 12879

1169. NG testified that the 1% loss rate of dredged sediment is justifiable because NG will use silt curtains to achieve reduced sedimentation loss. Further questioning revealed that silt curtains do not decrease sediment loss but rather address the geographic reach of the lost sediment by attempting to confine it to a smaller location.

Mr. Fissel, Transcript Vol. 114, lines 12852 and 12854
Exhibit B41-4, p. 65, Response to Federal Government IR No. 1, 30A)

1170. Questioning revealed that NG is also representing the silt curtain as a mitigation measure during dredging activities. The use of the silt curtain has been double-counted by NG. If a silt curtain was used to rely on a lower sediment loss rate, then it cannot be relied on as further mitigation of sedimentation impacts.

Mr. Fissel, Transcript Vol. 114, line 12871
Mr. Anderson, Transcript Vol. 114, line 12885

1171. At a minimum, this double-counting is indicative of NG's lack of attention to proper detail with regard to the adverse effects of construction and thereby inserts further uncertainty for the Panel to consider in its review.

1172. NG has measured the effect on sediment quality by the amount of deposition on surface substrates as a result of dredging operations. To determine significance, NG appears to have used a 1 cm deposition layer as a threshold.

Exhibit B3-12, p. 152

1173. NG estimated that under natural conditions 0.6 cm of sedimentation is expected in the area over the course of one year. From this, NG illogically extrapolated that, as such, deposition of a 1 cm layer in an eight week period was "not much more" and that the habitat was "accustomed to sediment rates such as that". NG has failed to assess the effects of a very short duration dump of sediment as compared to a slow deposit. When questioned, NG revealed that it had not considered what the maximum natural sedimentation over the course of an eight week period is in the Kitimat Arm.

Mr. Fissel, Transcript Vol. 114, lines 12942 and 12950
Mr. Anderson, Transcript Vol. 114, line 12943

1174. Natural sedimentation does not occur uniformly over the year. The greatest deposition rates would be seen during the freshet. NG estimated that it was possible that a 0.3cm layer could be deposited during the freshet and then, again illogically, stated that this deposition was akin to a three times greater deposition in eight weeks as a result of dredging. It is inappropriate for NG to conclude that sessile organisms will somehow be predisposed for successful adaptation when the 1.0 cm of deposition is expected.

Mr. Fissel, Transcript Vol. 114, lines 12953-12954
Mr. Green, Transcript Vol. 114, line 12961

1175. Finally, NG has not assessed the potential impacts of blasting noise on herring, herring larvae or juvenile salmon.

Mr. Hannay and Ms. Ahrens, Transcript Vol. 115, lines 15680-15685

1.2.3.3 Tanker Berthing and Booming Will Interfere with Movement Patterns

1176. The assessment of effects on marine fish caused by operations of the marine terminal is understated, unreliable and inadequate for the evaluation of this aspect of the proposed project.

1177. Juvenile salmon travel from Bish Creek and the Kitimat River through the area proposed for the marine terminal. In many cases they are at a sensitive point in their development as they are acclimating to the marine environment and using the vertically stratified salinity of nearshore waters to adapt to marine life.

1178. Interference with marine habitat occasioned by booming during loading operations stands to affect the passive early life stages of various species, including shellfish larva (oysters, clams), crab larva and zooplankton which provide food sources for eulachon larvae and juvenile salmon moving through the area.

1179. At early life stages many marine fish species rely on passive locomotion increasing vulnerability to predation. In-water barriers or obstructions can act as "collectors" of these early life stages, resulting in the congregation of prey species and inspiring predator aggregation, with the potential for increased predation where the barriers or obstructions are located. As the berthing and booming operations procedures will occur

throughout the lifetime of the proposed project, multiple generations of fish species may be impacted.

1.2.3.3.1 Species are Present in the Project Effects Assessment Area (PEAA)

1180. NG has noted that habitat features identified in DFO's Pathways of Effects that can be affected by construction, operations, and decommissioning of pipeline watercourse crossings including migration and access to habitats. NG has also provided limited assessment of migration corridors and access for salmon in the Freshwater Fish and Fish Habitat section of Volume 6A: Environmental and Socio-Economic Assessment (Exhibit B3-9):

> The maintenance of migration corridors and access to specific habitats is critical to many types of freshwater fish. Unimpeded access to spawning and rearing habitats is critical to salmon during their upstream migration from the ocean as adults, as well as during the downstream smolt migration to reach marine feeding areas (McPhail 2007; Scott and Crossman 1998).
>
> *Exhibit B3-9, pp. 73*

1181. NG notes that two chum salmon runs occur in the PEAA, one in summer and the second in fall. The summer chums migrate in June, July and August, and spawn in September and early October. The fall chum migrate in September, October and November and spawn from October to January (DFO 1999). Chum salmon fry migrate into the marine waters of Kitimat Arm and Douglas Channel in late winter and early spring and aggregate in nearshore waters for weeks to months before travelling toward open habitat. Marine terminal operations affect nearshore waters.

> *Exhibit B3-13, p. 6*

1182. The NG effects assessment presumes that adults and juveniles of all four key indicator species (eulachon, Pacific herring, rockfish, and chum salmon) are expected to be in the PDA and PEAA during the Project's life. The PEAA has been defined to include the area around and including the PDA where construction, operations and decommissioning have the potential to affect marine fish populations.

> *Exhibit B3-13, p. 6*

1183. NG acknowledges that the PEAA may also include important rearing and nursery areas for juvenile fish, such as rockfish, which prefer nearshore areas.

> *Exhibit B3-13, p. 33*

1184. Fisheries and Oceans Canada has confirmed that larval stages of eulachon use passive location in the sense that they can't propel themselves and move from place to place of their own volition. They have no capacity for maneuvering around obstacles within the water.

> *Mr. Engelsjord (DFO), Transcript Vol. 168, lines 17747-17748*

1.2.3.3.2 Operations Will Have Ongoing Effects

1185. NG has applied an assumed 24-hour discharge time for a full cargo for a tanker (noting that it will likely take less but failing to specify how long) and assumes that loading will take the same amount of time in its operations model of vessel traffic to assess the ability of a tug escort fleet to serve tankers calling at the terminal. The Haisla Nation submits that in the absence of actual design specifications detailing loading and discharge timeframes, the 24-hour window should be applied as part of the effects assessment. The proposed project estimates that 220 oil tankers will berth at the terminal every year. Each of these tankers will need 24 hours to load or unload. This means that for at least 60 percent of the year, the shoreline and nearshore waters will be blocked by containment boom.

Exhibit B44-3, p. 54

1186. Containment booms create a physical boundary, a barrier that encircles the tanker during loading operations and interrupts the contiguous shoreline and nearshore waters. NG has also confirmed that each tanker berth will be equipped with boom designed to maintain containment of any potential oil spills that may occur during loading of oil sands products. Boom will not be deployed for the unloading of condensate due to the high volatility of the product and the potential for increased risk of explosion.

Exhibit B23-11, p. 54
Exhibit B165-3, p. 26 (Commitment OM-06-08)

1187. Ship length will range from 220.8 to 343.7 metres with beams ranging from 32.2 to 70.0 metres. Large amounts of containment boom will be necessary in order to ensure that the objective of spill control is achieved. The presence of berthed vessels with accompanying boom on an ongoing and regular basis will present obstructions to the marine environment and have the potential to affect fish movement and habitat. These potential effects have not been adequately assessed by NG.

Exhibit B23-10, p. 17

1.2.3.3.3 NG's Assessment is Inadequate and Unreliable

1188. NG has assessed some of the operations-related environmental effects of the marine terminal on marine fish. NG acknowledges that in-water infrastructure (marine terminal, berths and associated shading, underwater structures) may result in changes in habitat availability. NG also acknowledges that berthed tankers (and associated combustion emissions, inert gas exchange, prop wash, noise, boom deployment) may result in changes in habitat quality and acoustic disturbance. The associated effects of in-water infrastructure and the presence of berthed tankers may result in physiological stress, physical damage, change to natural movements, induced behavioural changes, mechanical damage to eggs and larvae, decreased critical spawning or rearing habitat and the creation of new habitat.

Exhibit B3-13, p. 3

1189. NG's application also states that structures may be obstructions that alter fish movements and acknowledges that this type of interference has the potential to affect natural migration or spawning behaviour of marine fish.

Exhibit B3-13, p. 34

1190. However, NG has concluded, without appropriate assessment, that "[n]o additional changes in habitat availability, apart from those outlined for construction, are expected during routine operations."

Exhibit B3-13, p. 34

1191. The Haisla Nation disagrees with the conclusions presented by NG in Table 10-4 Characterization of the Residual Effects on Marine Fish – Habitat Quality of Exhibit B3-13 concerning the adverse effects associated with in-water infrastructure and berthed tankers. The Haisla Nation considers the operations related adverse effects associated with containment boom surrounding tankers to have the potential to be high magnitude, both site-specific and regional in geographic extent, with regularly occurring frequency and potentially permanent duration. The reversibility of the effects on marine fish cannot be properly understood until the effects are properly assessed. The cursory determination that the effects will be negligible is not supportable and fails to adequately consider the potential effects of these aspects of marine terminal operations on marine fish.

Exhibit B3-13, p. 30

1192. The DFO has not assessed the potential adverse effects on the survival rates of larval stage eulachon present at the terminal site if containment booms were to be in place for long periods of time.

Mr. Fanos (DFO), Transcript Vol. 168, lines 17758-17759

1193. The failure to consider operational impacts on habitat beyond construction presents an unrealistic assessment of environmental effects of the Project on marine fish and is an unreliable basis upon which to assess Project effects.

1194. NG's assessment of potential effects of construction, operations and decommissioning on marine fish found that:

> No major effects on the habitat use and movements of marine fish are expected to result from the construction and operations of the marine terminal because:
>
> - the PDA does not overlap with any spawning habitat for any of the KIs
> - construction activities will be short in duration
> - similar habitat is abundant within the PEAA

- following construction, marine fish are expected to return to and use the PDA, including newly exposed rock substrates in the marine terminal area
- marine infrastructure may provide additional shelter and habitat for some species of fish

The localized temporal and spatial nature of change in habitat availability during construction, operations and decommissioning phases, coupled with the mitigation measures to be implemented, suggest that potential environmental effects of the Project are of negligible magnitude, short-term and reversible.

Exhibit B3-13, p. 35-36

1195. This conclusion cannot have been properly reached, given NG's failure to conduct surveys to assess diversity and abundance of fish species and life stages, quantify habitat, or quantify the environmental quality of the habitat (see paras. 1138 to 1147, above).

1196. The deficiencies of the NG environmental effects assessment associated with the failure to adequately assess the environmental effects of marine terminal operations on marine fish are compounded by NG's inclusion of a predicted return to and use the PDA in its assessment of effects. NG has not completed the analysis and assessment of the effects of marine terminal operations necessary to confidently state that the marine terminal area will continue to provide habitat for fish.

1197. NG has made superficial mention of potential effects associated with tanker berthing and booming interference with fish movement patterns at the marine terminal but has not completed a reliable and transparent assessment of these aspects of project related effects on marine fish. The conclusions of the environmental effects assessment relating to marine fish should be considered incomplete and unreliable to the extent that operations related effects of the marine terminal are dismissed without adequate assessment.

1.2.3.4 Potential Toxicity of Chronic and Permitted Releases of Oil

1198. NG has assessed the potential for releases of oil from the terminal as a result of routine operations to determine whether there is a potential adverse effect to fish or human health. In doing this, the assessment made a number of assumptions about the type of oil and the amount of oil that would be released to the marine environment.

Exhibit B3-12, pp. 29, 32-33 and 36-37

1199. NG's Marine Terminal Environmental Risk Assessment is based on a fictional composite hydrocarbon, which is based on three "representative" samples. The three samples provided by NG for analysis of toxicity are the same samples discussed in the context of the *EHHRA* in the context of a pipeline spill. As set out at paras. 952 to 966 above, these samples are not, in fact, representative of the products likely to be transported on the proposed project. Thus, any composite based on these samples will not be representative either.

Exhibit B9-19, p. 40
Exhibit B9-24, p. 36

1200. Further, the creation of a composite sample distorts the nature of the sample; it blends the COPC concentration in a way that attenuates the maximum concentration. Thus, using a composite sample could mask potential toxicological effects.

1201. The marine terminal will be permitted to discharge up to an amount of 15 parts per million oil and water as part of its routine operations. NG has used this amount as a maximum oil release for the purposes of assessing routine effects from the operations of the marine terminal. The assessment therefore is incomplete as it does not assess accidental releases at the terminal which are above this threshold.

Exhibit B3-12, p. 27

1202. As stated, the water oil content is determined assuming an annual on-land oil release of 100 m^3 entrained by the reservoir, and an annual recovery of 1 m^3 of oil due to transfer operations recuperated along with 1,000 m^3 of seawater.

Exhibit B9-24, p. 52

1203. The 15 ppm limit and the assumption about oil release and recovery are inadequate to avoid toxic effects to any aquatic species or early life stages in the vicinity. Total hydrocarbon content is not sufficient to understand the composition and levels of many highly toxic constituents known to exist in oil. Without this knowledge, the potential for toxic effects is likely. Discharge limits must be set based on the levels of known toxic constituents, not on a generic volume of total hydrocarbons. This should not be left to provincial permitting since requirements for reservoir design and volume and treatment, if necessary, will be important to mitigate any potential effects.

1204. Northern Gateway's Marine ERA has made unjustified assumptions that limit the reliability of the assessment. During oral questioning, NG was unable to provide justificatory reasoning for these assumptions.

1205. The Marine ERA considers three routes of exposure to COPC to aquatic KIs: marine algae exposed to COPC in water, benthic invertebrates and fish exposed to COPC in sediment and fish and invertebrates exposed to COPC in water. COPC are not considered likely to biomagnify in successively higher concentrations as they pass up the food chain.

Exhibit B9-19, pp. 5 and 46

1206. While the assessment addresses biomagnification, NG assumes that fish and invertebrates will have no exposure to COPC through their diet. Expert testimony from NG stated that exposure to hydrocarbons occurs primarily through aquatic organisms ventilating their gills, evading questioning regarding exposure of aquatic organisms through diet.

Dr. Stephenson, Transcript Vol. 114, lines 13257, 13263

1207. In order for the Marine ERA to have value to the Panel it must consider all pathways of exposure, despite perceived contribution to effect. Many oil PAHs will adhere to suspended particulate matter and onto invertebrate food sources for fish, and could be ingested and cause toxic effects. By ignoring this route of exposure, NG has not addressed the scope of potential effects that can occur.

1.2.4 Haisla Nation Will be Deprived of Access

1208. The construction of the Kitimat Terminal will not only alienate a large section of Haisla Nation aboriginal title lands and make it unavailable for the exercise of traditional practices, it will also sterilize an area of foreshore and marine riparian habitat and marine waters from use by the Haisla Nation through the imposition of a 150 m wide safety zone at the marine terminal. NG has stated this will cover an area of 0.33 square kilometers (33 ha), which means a 2,200 m stretch of foreshore and marine riparian habitat will become unavailable for use by Haisla Nation members in the exercise of their aboriginal rights.

Exhibit B3-1, p. 41
Mr. Green, Transcript Vol. 114, lines 13540 to 13544

2. Effects of Accidents and Malfunctions Associated with the Marine Terminal

1209. The Haisla Nation submits that the Panel cannot recommend that the proposed project can proceed as an accident of malfunction is likely to result in a significant adverse environmental effect.

2.1 Effects of a Spill – Significant Adverse Effects

1210. NG has acknowledged that a spill from the marine terminal (or from marine shipping) will likely have serious adverse effects. The adverse effects of a spill of diluted bitumen or synthetic oil would likely be more extensive than those of condensate, but they are all anticipated to have adverse effects that cannot be mitigated. Diluted bitumen or synthetic oil would spread over the water surface, immediately reach the western shores of Kitimat Arm, and develop areas of hydrocarbons on top of the water surface that would be detectable for a number of hours, depending on emergency response and meteorological and oceanographic conditions. Shoreline remediation of sensitive habitats in affected areas could result in temporary (one to two-year) loss of habitat complexity.

Exhibit B3-22, p. 92

1211. Adverse effects could impact: shoreline vegetation, intertidal invertebrates, fish that use nearshore habitat (e.g., eulachon returning in winter to spawn in the Kitimat River), water birds (e.g., Marbled Murrelets, Surf Scoters), marine mammals (e.g., whales, seals and sea lions), and semi-aquatic mammals (e.g., river otter).

Exhibit B3-22, p. 92

1212. The effects could occur through both short-term mechanisms (acute toxicity from ingestion of oil and oiled prey, oiling of animals, inhalation of vapour and long-term mechanisms (chronic effects from loss of habitat or uptake of contaminants). Lesser

effects could occur for species that use shoreline habitat less frequently, such as scavenging bears, deer, crows or ravens that might feed on contaminated food sources. Changes in habitat quality and mortality of prey organisms could result in further effects. For example, loss of herring eggs and fry following a spring spill would lead to loss of prey and longer-term effects on salmon populations; these changes could affect human use of the fisheries resources, as well as bird and mammal predators. The extent of effects on biota would be determined by their vulnerability (i.e., how likely they are to be present, means by which they were exposed, sensitivity of the life stage at that time of year) and by the time needed for recovery of a population.

Exhibit B3-22, p. 92

1213. Both Environment Canada and Fisheries and Oceans Canada agree that a spill, if it reaches the intertidal zone, which a spill at the proposed Kitimat Terminal is likely to do almost immediately will affect the natural environment including the surface water. Both Environment Canada and Fisheries and Oceans Canada agree that the impact would be particularly negative to species sensitive to the toxic properties of oil. Fisheries and Oceans Canada added that smothering and physical fouling are also of concern.

Dr. Esler (EC), Mr. King (DFO), Dr. Ford (DFO), Mr. Groves (DFO) & Dr. Hollebone (EC), Transcript Vol. 169, lines 19943-19975

1214. NG proposed to rely on emergency response and cleanup for mitigation:

> Emergency response plans, booms around sensitive habitat and cleanup procedures would be implemented immediately to mitigate adverse effects. Monitoring will be in place to keep track of post-cleanup recovery.

Exhibit B3-22, p. 92

1215. NG acknowledges that while preventive measures are intended to keep the likelihood of a spill low, there is the potential for spills during operations of the marine terminal.

Exhibit B3-22, p. 109

1216. In order to reach a conclusion that the adverse environmental effects of a spill into the marine environment, be it from the proposed Kitimat Terminal or from a marine tanker associated with the proposed project, NG relies on the likelihood of a spill being low, mitigation of effects, and recovery of the environment. For the reasons set out below, the Panel cannot conclude that a spill into the marine environment is not likely to result in significant adverse environmental effects.

2.2 NG's Risk Assessment is Inadequate and Underestimates Likelihood of a Spill

1217. NG states that "[w]hile there is potential for spills to result in significant adverse consequences on the biophysical environment, the probability of large spills is considered to be low and therefore any significant adverse effects is unlikely". NG seeks to rely on project design measures, construction procedures, and operational measures and protocols to reduce the likelihood of a spill.

Exhibit B39-3, pp. 50-51

1218. The design measures at the terminal are not effective to reduce risk.

2.2.1 Design Not Addressing Risk

1219. NG has failed to address critical seismic issues in its proposed design. Both the tank terminal and the marine terminal are affected by design issues associated with seismic concerns.

2.2.1.1 External Floating Roof-Tanks Pose Risk

1220. NG proposes to use external floating-roof tanks to store oil at the proposed tank terminal. These tanks are, by a wide margin, the most common type of tank involved in petrochemical accidents.[159]

Exhibit B1-5, p. 66-67 and 73
Exhibit D80-13-1, pp. 56-58

1221. External floating-roof tanks are susceptible to roof sinking due to rain or other factors, vapour emissions, and corrosion. Incidents in Japan, Costa Rica and Turkey have demonstrated that floating-roof tanks suffer damage to varying degrees during seismic events, resulting in roof failure as well as cracking, buckling and rupturing of tanks.

Exhibit D80-13-1, pp.56-58

2.2.1.2 NG Relying on Code Inadequate to Address Seismic Risk

1222. NG states that it will rely on API 650 as its primary standard even though expert reports and studies[160] make clear that API 650 contains performance-based rules which have proven to be inadequate. The shortcomings of API 650 are not addressed in the application.

Exhibit B39-3, p. 125, D80-13-1, pp. 56-58, NGP Response to Haisla Nation IR No. 1.36c)-f)
Exhibit B83-2, p. 47

-- if you meet the code you have not eliminated the risk, the risk is still there. So if the risk is still there then how much is the risk. The code doesn't tell you that.

Dr. Malhotra, Transcript Vol. 109, line 5638

1223. The design rules in API 650 are minimum requirements as clearly stated in the Standard. Design according to API 650 does not guarantee that there will be no leaks in the tanks

[159] Chang, J. and C.-C. Lin. 2006. A study of storage tank accidents. *Journal of Loss Prevention in the Process Industries.* 19: 51-59; Malholtra, P.K.. 2002. Cyclic-Demand Spectrum. *J. Earthquake Eng. Struct. Dyn.*, 31(7): 1441-1457; Malhotra, P.K., Wenk, T., Wieland, M.. "Simple Procedure for Seismic Analysis of Liquid-Storage Tanks." *Structural Engineering International*, 3 (2000): 197-201; Lieb, J.M.. 2006. Seismic Design of Liquid Storage Tanks. Update to API 650 Appendix E; Cortes, G. and A. Nussbaumer. 2010. Seismic Behavior of Shell-to-Base Connections in Large Storage Tanks. *Report Number 1C 491-1*, EPFL, Lausanne, Switzerland , all as referenced in preamble to Haisla Nation IR No. 1.36 (*Exhibit D80-13-1*).
[160] Ibid.

due to future earthquakes. API 650 does not address: (1) the seismic design of floating roofs; (2) nonlinear response of tanks during seismic shaking; and (3) nonlinear interaction between soil-structure and the fluid.

Exhibit D80-13-1, pp.56-58

1224. API 650 does not provide complete technical specifications addressing seismic risks:[161]

- API 650 lacks an explicit expression for evaluation of maximum sloshing wave height during a seismic event.
- API 650 does not specify the type of piping (flexible or otherwise) necessary to withstand a significant seismic event.
- API 650 does not provide guidance on the tank design required to minimize the likelihood of elastic-plastic buckling during a seismic event.

1225. API 650 also lacks evaluation details for maximum sloshing wave height or elastic-plastic buckling due to a seismic event, both potential side effects of seismic activity which can lead to catastrophic failure of the tank(s).

1226. NG's application and evidence do not address these shortcomings or provide any information about how risk is informing evaluations of maximum sloshing wave height or elastic-plastic buckling due to a seismic event and selection of piping type. Further, NG does not disclose how it will address these risks in the absence of code specifications which provide guidance.

1227. API 650 does not provide complete technical specifications addressing seismic risks. NG did not include a site-specific seismic hazard assessment with its application or accompanying information, nor is it known if the proponent even had this assessment done. More specifically, NG has failed to address the following critical issues:[162]

- Sloshing in tanks, which can lead to rupture, occurs from long-period waves which means an earthquake can occur hundreds of kilometers away (such as the 9.1 earthquake in October of 2012 near Haida Gwaii) and still produce this effect. However, the amplitude of long-period waves is not sufficiently characterized in the design standards on which NG is relying. Roof failure, cracking and rupturing of tanks area all documented effects in floating-roof tanks due to seismic activity.

- The natural period of vibration for tanks this size (74 m diameter) is about 10 seconds and thus the response of sloshing liquid within the tanks will be dictated by long-period waves. Such waves can travel from earthquakes with epicentres hundreds of kilometers away without any significant attenuation (i.e., they retain their amplitude and can therefore be expected to cause sloshing). NG has not explained long-period motions will be characterized for computing the response of sloshing liquid in oil and condensate tanks, or how they will be considered in tank

[161] Malholtra, P.K.. 2002. Cyclic-Demand Spectrum. *J. Earthquake Eng. Struct. Dyn.*, 31(7): 1441-1457; Cortes, G. and A. Nussbaumer. 2010. Seismic Behavior of Shell-to-Base Connections in Large Storage Tanks. *Report Number 1C 491-1*, EPFL, Lausanne, Switzerland.
[162] Malhotra, P.K., Wenk, T., Wieland, M.. "Simple Procedure for Seismic Analysis of Liquid-Storage Tanks." *Structural Engineering International*, 3 (2000): 197-201.

design, other than referring to API 650 as guiding the design. API 650 does not take long-period wave effects into account.

Exhibit B83-2, pp. 47-99

- The dynamic response of a floating roof to seismic motions is complex and API 650 does not address the analysis and design of this type of roof.[163] Some examples include: the deck of a pontoon floating roof can be torn by radial shortening, caused by vertical displacements; the deck can pull the pontoon inward, causing it to buckle; and the pontoon can be damaged by circumferential bending due to large vertical displacements. (These examples have all been observed during past earthquakes.) A damaged floating roof can sink or cause a fire. Floating roofs have also been damaged by long-period waves (see explanation in previous bullet point). Enbridge has not provided any in-depth description of the seismic analysis or design of its floating roofs.

  Exhibit B83-2, pp. 47-49

- Code-based design tanks, such as those proposed by NG, are expected to experience inelastic response during design ground shaking.[164] If the inelastic response occurs for a sufficient number of cycles, however, low-cycle fatigue damage can occur, and this cyclic aspect of earthquake loading is not explicitly considered in code-based design. NG has provided no information on this issue, nor has it indicated in any way that it will go beyond the requirements of code-based design.

1228. NG is thus ignoring potential hazards at the proposed tank and marine terminal. NG is compounding the risk of its proposed tank design by failing to provide adequate impoundment for the event of tank failures.

1229. NG proposed an impoundment reservoir and berms around the individual tanks which would be big enough to contain 110% of the volume of the largest tank. This impoundment volume is not large enough to contain the volume from a simultaneous rupture of all tanks.

Exhibit B39-3, pp. 124-125, NGP Response to Haisla Nation IR No. 1.36b)

1230. When questioned about this, NG dismissed the Haisla Nation's concern, stating:

> **A scenario where spill volumes at the terminal would exceed the capacity of both the tank lot containment and the remote impoundment reservoir capacities is not a credible design scenario.**

Exhibit B45-8, Adobe p. 23, NGP Response to Haisla Nation IR No. 2.9a)

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[163] Chang, J. and C.-C. Lin. 2006. A study of storage tank accidents. *Journal of Loss Prevention in the Process Industries.* 19: 51-59; Lieb, J.M.. 2006. Seismic Design of Liquid Storage Tanks. Update to API 650 Appendix E.
[164] Malholtra, P.K.. 2002. Cyclic-Demand Spectrum. *J. Earthquake Eng. Struct. Dyn.*, 31(7): 1441-1457
Cortes, G. and A. Nussbaumer. 2010. Seismic Behavior of Shell-to-Base Connections in Large Storage Tanks. *Report Number 1C 491-1*, EPFL, Lausanne, Switzerland.

1231. The dismissal of the risk of multiple or comprehensive tank failure is tantamount to Enbridge's failure to conceive that a pipeline rupture could occur during a pipeline shutdown. Enbridge's wholly unimaginative approach to risk scenarios contributed to the spill of 3,750,000 liters of oil into the Kalamazoo River. Enbridge has acknowledged that "its technology and other processes did not detect outlier events" and that Enbridge did not expect its pipeline to rupture during a controlled shutdown when pressure was decreasing so failed to detect the rupture.

Mr. Kresic, Transcript Vol. 96, lines 19579-19580
Mr. Baumgartner, Transcript Vol. 96, lines 19574-19578

1232. Despite the "learnings" NG claims be taking from the Kalamazoo spill, and the professed commitment to "a deeper contemplation of what could possibly happen", NG has not applied these learnings to its purported risk-based approach to design. By failing to contemplate simultaneous rupture of all tanks, NG is not preparing for a worst-case scenario at the terminal site.

Mr. Kresic, Transcript Vol. 92, line 14902

1233. The Panel appears to have recognized the paucity of NG's proposed design for containment, by proposing a potential condition requiring secondary impoundment based on six times the volume of the largest tank.

1234. NG states that the proposed tank farms will be in remote areas and have secondary spill containment and control, NG should not be required to exceed the seismic provisions of API 650.

Exhibit B83-2, p. 47

1235. NG's reliance on remote location and proposed secondary impoundment of 110% shows a blatant disregard for potential worst-case scenarios and the extent and degree of effects from a spill at the tank terminal into the marine environment. It also writes effectively characterizes the Haisla Nation as deserving a lower level of protection because it lives in a remote location. If anything, the remoteness of Haisla Nation Territory argues for a much higher level of environmental safeguards as the remoteness of the Territory renders spill response even less effective than elsewhere.

2.2.2 Unproven Geotechnical Stability at Marine Terminal Poses Risk

1236. Unproven geotechnical stability at the proposed marine terminal site poses a risk for the integrity of the terminal site. Two different, documented, viscous slides have occurred in Kitimat Arm, in the vicinity of the proposed marine terminal, as recently as 1974 and 1975. In 1976, a large submarine landslide occurred at the north end of Moon Bay, also in Kitimat Arm approximately 4 km north of the proposed terminal site, during the construction of a rip-rap breakwater. It is not known if these are the only three recent slides in Kitimat Arm.

Exhibits E7-4-2 p. 4
Exhibit E7-4-3, pp. 6-7
Exhibit B80-14, p. 22

Dr. Lintern (NRCan), Transcript Vol. 170, lines 22191, 22197 and 22200

1237. In addition, it is thought these slides caused waves a high as 4 m. NG has not assessed how 4 m high waves could impact berthed tankers and loading arms, or how these waves may contribute to an increase in the risk of spills, particularly during transfer operations.

Exhibit E7-4-3, p. 7

1238. The probability of a submarine slide, either viscous or rigid-body, occurring near the terminal site (in Kitimat Arm) is not known. Natural Resources Canada has stated it cannot calculate risk of a submarine slide occurring within the vicinity of the proposed terminal based on the information that has been provided by NG.

Dr. Lintern (NRCan), Transcript Vol. 170, lines 22206-22207

1239. The risk of a submarine slide at the marine terminal site has not been adequately contemplated by NG. Nothing in NG's application demonstrates that NG has considered the risks associated with submarine slides at the marine terminal and how these may contribute to an accident or malfunction.

1240. It is not possible to assess the likelihood of a submarine slide at the marine terminal on the basis of the information provided by NG.

2.3 NG is Understating Potential Effects of a Spill

1241. NG has modelled a spill of 250m^3 of diluted bitumen at the marine terminal. NG predicts:

> In this example, winds and currents would transport oil north and east up Kitimat Arm over the first 10 hours. Oil would reach the western shores of Kitimat Arm almost immediately along a 500 m section of shoreline adjacent to the north side of the terminal. After three hours, is predicted to reach the eastern shores of the Arm at Kitamaat Village and after four hours, oil is predicted to be stranded from the marina north of Kitamaat Village to the southern marina at the end of Haisla Avenue, with a total affected shoreline of 2.5 km. No oil is predicted to remain on the water surface after 9 hours.

Exhibit B3-22, p. 113

1242. Although the modelling suffers from the shortcomings identified elsewhere in this submission, the scenario described above which would see Kitamaat Village fouled by NG's diluted bitumen within hours of an incident raises profound concerns for the Haisla Nation.

2.3.1 NG Has an Inadequate Information Base to Properly Assess Effects of a Spill

1243. While NG has filed evidence to suggest that the effects of routine releases during operations will be low, it has based this conclusion on an inadequate information base. Further, the lack of information relating to fish and fish habitat, as discussed at paras. 1138 to 1147 above, indicates that NG does not have a full picture of the resources that are at risk.

2.3.2.1 Inadequate Baseline Information About Fish

1244. As set out at paras. 1138 to 1147 above, NG has does not have enough information about fish and fish habitat and other marine habitat at the marine terminal to know what species are there in what life-stages at any given time of the year.

1245. As as a result, NG does not have enough baseline information to realistically assess the potential effects of a spill.

2.3.2.2 Environmental Sensitivity Atlases are Incomplete

1246. NG has relied on draft environmental sensitivity atlases to support its ESA, with an intention to update these if the proposed project is approved. NG is of the view that these atlases are adequate for the purpose of assessing the proposed project. The Haisla Nation disagrees. The atlases have not yet been ground-truthed, and they require **substantial** updating.

Mr. McHugh, Transcript Vol. 133, line 971
Mr. Green, Transcript Vol. 133, lines 996-1000 and 1030-1032

1247. The absence of up-to-date environmental sensitivity mapping prevents a true assessment of risk. In response to questioning from the Province of British Columbia, NG elaborated on the development of geographic response plans and the use of stochastic modelling. NG's oral evidence, however, reveals the extent to which the absence of stochastic modelling and comprehensive environmental sensitivity mapping prevent a reasonable assessment of the risks associated with the proposed project:

> **4575**. Again, that data is included in the existing atlases but we understand that that's some -- something in the range of 20 years old and we would like to update that. The existing traditional use studies that were completed by some of the Aboriginal groups don't provide us with that sort of site-specific information so the harvest study would do that.
> **4576**. The last one that will be of importance are the marine mammal surveys which again are regional and looking at seasonal habitat use by marine mammals. And so when we have all that information together, along with other existing information from the region, we'll have a very rich database on which to develop geographic response plans.
> **4577**. And going back to the use of stochastic modelling I guess from an environmental perspective what I see as the real value there is we'll have a spatial -- temporal spatial database, we can then overlay stochastics on that and look at here's really important biological areas and here's their risk of oiling and here's what we could do in the geographic response plan to address that.
> **4578**. So that's one of the approaches we've been looking at here. Could we have done that now? Well, possibly, but the data I think really is not at the quality that I think would be tremendously useful. The regional geo-spatial data or temporal spatial data is -- is pretty dated and I think it would be much better to spend that effort on new data going forward.

Mr. Green, Transcript Vol. 136, lines 4575-4578

1248. The Panel must therefore presume that the adverse effects of a spill at the marine terminal will be substantial. Given the location of the terminal adjacent to Bish Creek and the Kitimat River Estuary, it can be presumed that there will be extensive and significant adverse effects from a spill of 250m^3 or greater. Mitigation of such a highly complex ecosystem is very unlikely. It should be presumed that it will take years to recover and any impacts and effects of cleanup or residual contamination will serve to reduce the likelihood of recovery since each year that goes by results in the loss of another generation of fish and wildlife.

2.3.3 Fate and Behaviour of Diluted Bitumen in Environment not Well Enough Understood to Properly Assess Effects

1249. The information provided by NG is not sufficient for understanding the effects of the proposed project. A spill of oil into the marine environment is likely to result in adverse environmental effects. The extent to which such effects can or cannot be mitigated and the extent to which they may be significant depends very much on how the spilled products behave when released to the environment. Their behaviour is intricately linked to composition, which also affects toxicity. Finally, the way in which the products behave will affect what biota they will affect, when, as well as the ability to contain and remove the products from the environment.

1250. The uncertainty surrounding the fate and behaviour of diluted bitumen when released to the environment prevents the reasonable assessment of adverse environmental effects, whether they can be mitigated, and significance.

2.3.3.1 Fate and Behaviour Must Be Understood to Assess Potential Effects

1251. NG has submitted its application at a point in time when the fate and behaviour of diluted bitumen that is released to the environment is poorly understood. NG has proposed that this gap in information does not affect the ability to assess the effects of the proposed project, but has acknowledged that more information would be useful for spill preparedness purposes. Spill response is a critical aspect of NG's proposed mitigation. The significance of adverse effects cannot be assessed in the absence of an understanding of mitigation.

1252. The Haisla Nation thus disagrees that an understanding of the fate and behaviour of the products to be transported on the proposed project is not required in order to assess potential effects. This information is required to both assess potential effects and to be prepared for a spill. The evidence in these proceedings supports this view.

1253. In order to assess the potential effects of the proposed project, it is important to understand the pathways of effects. For oil that is spilled into the environment, understanding the pathways of effects requires, in turn, an understanding of the fate and behaviour of the products:

> **17374**. Has DFO established the pathways of effects relating to oil spills in the marine environment?
> **17375**. **MR. MICHAEL ENGELSJORD:** DFO hasn't conducted a review of effects of oil spills in the environment.

> **17376**. **MR. McCORMICK:** Has DFO conducted an assessment to determine whether the information provided by Northern Gateway is both sufficient and accurate enough to adequately assess the risks to fish and fish habitat in the event of a spill?
> **17377**. **MS. BONNIE ANTCLIFFE:** So with respect to that question, an important component of the environmental effects piece would be understanding the fate and behaviour of the products, and we've heard from Environment Canada with respect to recommendations for further work in that regard.
> **17378**. **MR. McCORMICK:** Thank you.
> **17379**. Perhaps I can help to clarify the question. The question goes to the issue of whether the information that's been provided by Northern Gateway to date is both sufficient and accurate in the eyes of DFO to serve as the basis for determining or assessing the risks to fish and fish habitat in the event of a spill?
> --- (A short pause/Courte pause)
> **17380. MS. BONNIE ANTCLIFFE:** So thank you for your patience.
> **17381**. With respect to the information conducted by the Proponent for the environmental assessment purposes, DFO has not reviewed that information, but we think that what we have on the environmental effects side is a good starting point for the environmental assessment.
> **17382**. We did, again, note that with respect to the fate and behaviour that there are deficiencies noted by Environment Canada.
>
> *Mr. Engelsjord (DFO) and Ms. Antcliffe (DFO), Transcript Vol. 167, lines 17374-17382*

1254. Federal government scientists, put forward by the federal government "to provide to the Panel expert or specialist information or knowledge" have advised that without understanding fate and behaviour of a spilled product, it is not possible to understand pathways of effects. Pathways of effect are a critical aspect of effects assessment.

2.3.3.2 NG's Written Evidence Does Not Provide an Understanding of Fate and Behaviour

1255. NG has provided written evidence that includes modelling of select spills at the marine terminal, in the Confined Chanel Assessment Area and in the Open Water Area. This modelling is based on weathering data provided by SL Ross for Syncrude Synthetic Light Oil (SYN), CRW condensate (CRW), Cold Lake bitumen diluted with condensate (CLB), and MacKay River Heavy bitumen diluted with synthetic light oil (MKH).

Exhibit B16-31, pp. 19-29

1256. SL Ross assessed how samples provided by NG weathered in order to inform spill modelling. The SL Ross weathering results were used as inputs into both the freshwater and marine modelling.

1257. In September of 2012, Environment Canada filed the *Environment Canada Technical Review of Enbridge Northern Gateway's Marine Spill Modelling Studies and Related Environmental Consequence Analysis*. This technical report critiqued the modelling conducted by NG and identified problems with the overall approach, problems with scenario selection and problems with consequence analysis.

Exhibit E9-32-2

1258. Environment Canada has highly critical of the SL Ross oil fate modelling, and describe it has having provided "non-realistic results related to weathering":

> One of the most significant issues with the results of the fate modelling shown in both Technical Data Reports (SLRoss 2010a,b) relates to the calculation of natural dispersion. The percentage of oil dispersed is highly overestimated. The algorithm used to model oil dispersion provides unrealistic results. Not only do the data show considerable overestimation of the dispersion, but they also show questionable variations of the process with time. The model needs significant revision and validation. Similar observations were made when checking modelling results for the specific examples discussed in Section 4.2 in Hay and Co. (2011a). Not only the results show overestimations of the dispersion of oil, but also oil re-surfacing was not taken into consideration.

Exhibit E9-32-2, p. 24

1259. Environment Canada also identified the model has having shown "considerable overestimation of dispersion" and also failed to take into consideration re-surfacing of oil.

Exhibit E9-32-2, p. 24

1260. As of December 2012, Environment Canada still identified the following as open questions about the behaviour of oil:

- Changes to dilbit chemistry by evaporation of diluent components (rate of change)
- Dispersion of oil in water (droplet size, rise time, coalescence)
- Resuspension and remobilization potential
- Dissolution in water & bioavailability
- Toxicity, chemical and physical
- Persistence
- Interactions of factors to affect behaviours

Exhibit E9-70, Environment Canada Response to Undertaking U86

1261. During oral questioning, NG repeatedly referred to additional modelling performed by SL Ross, which purported to establish that diluted bitumen, when released to the environment, will not sink by weathering alone. The study, *Meso-scale Weathering of Cold Lake Bitumen/Condensate Blend* dated October 2012, prepared by SL Ross (the "meso-scale study"), was filed as evidence on February 6, 2013 and was subject to short-notice cross examination by some parties.

Exhibit B193-2

1262. The primary goal of the study was to investigate the density change of the diluted bitumen product as it weathers under more realistic conditions than those used in

standard testing completed by SL Ross for NG in 2005. The primary concern being addressed was the potential for the sinking or submergence of diluted bitumen products after prolonged exposure on water.

Exhibit B193-2 p. 2

1263. The meso-scale study found that the "oil subjected to the weathering tests was measured to have an ultimate density that approached but did not surpass that of the water." The potential for the oil to further increase in density under alternative conditions was not discussed or assessed as part of the study.

Exhibit B193-2 p. 16

1264. This is the only study that has been commissioned by NG to examine whether or not diluted bitumen will float or sink.

Mr. McHugh, Transcript Vol. 141, line 12822

1265. The SL Ross 2012 study imposed strict laboratory conditions onto the oil being studied, which included testing done at 15^0C and measurements taken at 20^0C. Further, researchers adjusted fans, increased thrusters to move oil past dead zones and adjusted UV lamp output. The water was kept free of sediments or particles during the meso-scale study.

Exhibit B193-2, p. 6, 8, 14-16
Mr. Belore, Transcript Vol. 141, line 12787

1266. NG has confirmed that the meso-scale study's water motion and small cascading waterfall were not representative of the degree and intensity of motion that is present in the CCAA.

Mr. Belore, Transcript Vol. 141, lines 12797, 12919

1267. Two trials were conducted, differing in UV exposure and duration, and no replicate trials were conducted to confirm the results. The Haisla Nation submits that the failure of NG to complete replicate trials detracts from the reliability of the conclusions of the study.

Exhibit B193-2, p. 6
Mr. Belore, Transcript Vol. 141, line 12816

1268. At the end of the trials, oil on the surface or adsorbed to the sidewalls in the upper 10cm of water was considered surface oil. Oil adhered to the sidewalls below the 10cm mark was also measured. This volume of oil was not reflective of the entire amount of oil that dropped below the 10cm mark during the test. As such, the study did not present information regarding the amount of potential sub-surface exposure to aquatic organisms in the event of a spill.

Exhibit B193-2, p. 13
Mr. Belore, Transcript Vol. 141, line 12887

1269. In response to questions about the effects of an increase in density due to a decrease in temperature, NG stated that the increase in density at lower temperatures would be offset by other factors and would not result in oil sinking. NG did not support this statement with any reference to empirical data. NG later confirmed that it would be necessary to conduct testing at a lower temperature to be able to see what the actual change in properties would be.

Mr. Belore, Transcript Vol. 141, lines 12717-12721
Mr. Belore, Transcript Vol. 141, line 12860

1270. Evidence filed by Gitxaala indicates that had the meso-scale tests been conducted at 12^0C instead of 15^0C, the weathered cold lake bitumen would have sunk by the 96-hour mark in ambient conditions.

Exhibit D72-80-2, p. 9

1271. NG has agreed that temperatures of 20^o or 15^o C would not be common occurrences in the CCAA or the OWA.

Mr. Belore, Transcript Vol. 139, lines 9780-9783

1272. NG has also confirmed that the tank conditions were monitored and altered to ensure that the desired motion of oil throughout the tank was occurring.

Mr. Belore, Transcript Vol. 141, line 12735

1273. In response to questions about the applicability of the study to a spill in the CCAA or OWA, NG that the purpose of the meso-scale study was not to simulate a wide variety of environmental conditions but rather to look at the movement of oil in water under a small amount of energy with controlled UV light.

Mr. Belore, Transcript Vol. 141, lines 12739-12741, 12747

1274. If the study's variables were changed, the end results could be different:

> **12752**. **MR. RANDY BELORE:** If these values were changed, the end results could be different, I agree.
> **12753**. The positions of the fans and the thrusters were set in order to achieve the condition of keeping the oil on the surface and keeping it moving around the surface. If we increase the thrusters to too high a level, there's the potential for entrainment of the oil into the water due to the action of the thruster.

Mr. Belore, Transcript Vol. 141, lines 12752-12753

1275. In order to represent the specific environmental conditions that may be present in the event of an oil spill, the study would need to be at a larger scale in a different environment. The scaling used in this study is not reflective of what may happen in the marine environment.

Mr. Belore, Transcript Vol. 141, lines 12752, 12765, 12920-12923

1276. Further, SL Ross has not used this methodology on other oils whose properties are well understood. No other studies have been conducted in this tank using different parameters. As such, the predictive value of the results is unconfirmed.

Mr. Belore, Transcript Vol. 141, lines 12808, 12820

1277. This is the only additional study that Northern Gateway has conducted to look at whether diluted bitumen will sink or float. Despite the established concerns regarding the applicability of the study's results to the proposed project's potential effects, NG remains confident in the results. In questioning from the Panel, NG stated that SL Ross came closer than anyone to mimicking environmental conditions – contradicting earlier oral testimony cited above.

Mr. McHugh, Transcript Vol. 141, lines 12822-12826
Mr. Green, Transcript Vol. 175, line 28589

1278. SL Ross' experimental evidence and the susceptibility of diluted bitumen to sinking were analyzed in conjunction with the Confined Channel Assessment Area by Dr. Short in Exhibit D72-80-2. The evidence reasoned that conclusions based on experiments at 15^0C were not valid at lower temperatures due to the relative greater increase in density of diluted bitumen compared to fresh or marine water. As such, some of the diluted bitumen would be expected to sink due to evaporative weathering in fresh and brackish marine waters in less than 24 hours following a spill. Dr. Short concluded that evaluation of the environmental risks associated with sinking bitumen products is hampered by the limited number of studies on the kinds of diluted bitumen products likely to be transported by the proposed project. Testing should be done on a much wider range of candidate products, at realistic oil slick thicknesses, and at realistic environmental conditions of wind speeds, temperatures and salinities.

Exhibit D72-80-2, pp. 2-3, 13

1279. Environmental Canada stated in oral testimony that there is a need for more information based on the results presented by SL Ross and by Dr. Short. There isn't enough data to make any conclusions on the fate of weathered oil. As such, NG's reliance on the SL Ross publication is unjustified and does not accurately portray the uncertainty of risk in the event of a diluted bitumen spill to the Panel.

Dr. Hollebone (EC), Transcript Vol. 173, lines 25472, 25523

1280. Determining whether diluted bitumen will sink, submerge or float is crucial to ensuring appropriate spill response capacity and preparedness and is a key component in the assessment of project effects. NG has invested very limited resources to examine this issue and has provided only feeble evidence for consideration by the Panel.

1281. The reliability of the meso-scale study is questionable due the failure to conduct replicate trails and the failure of NG to run similar tests on oils with well-known properties and behavior to confirm the effectiveness and accuracy of the methodology applied. Further, the meso-scale study only looked at the behaviour of diluted bitumen under very specific parameters.

1282. NG acknowledges that the testing conditions are not representative of the marine environment where the product may be spilled and intervener evidence provides contradictory results concerning the likelihood that diluted bitumen would sink if released into the marine environment. Environment Canada has provided evidence that there is insufficient information available to support any conclusive findings regarding whether the product will sink, submerge or float. The Haisla Nation submits that the probative value of the meso-scale study is limited and should be given little to no weight by the Panel in its assessment of the potential fate and behavior of diluted bitumen in the marine environment.

2.3.3.3 Uncertainty About Whether Diluted Bitumen Will Sink or Float Persists

1283. In general, the oral evidence provided by NG witnesses and by intervener and federal government scientists presents opposing views of how diluted bitumen will behave when released to the environment.

1284. While Enbridge is still in the process of trying to remove diluted bitumen from the bottom of the Kalamazoo River, NG persists with its risible suggestion that diluted bitumen does not sink. NG relies on the fact that the diluted bitumen which will be transported on the proposed project will be limited through tariffs to a density of no greater than 940mg/kg. NG has downplayed the other factors that may cause diluted bitumen to sink.

1285. Whether or not diluted bitumen will sink or float is not as simple as what its density is when it comes out of its container. Information such as corresponding density spectrum of the undiluted bitumen (prior to dilution), the viscosity and surface tension of the undiluted bitumen, the asphaltene content would all provide additional information about how diluted bitumen will behave after a release. This information is widely available and ought to have been provided by NG to assist in the assessment of fate and behaviour.

Dr. Short, Transcript Vol. 175, lines 28952-28956

1286. Federal Government scientists have acknowledged the role that factors other than density play in whether diluted bitumen will float or sink: temperature of oil and water and the salinity of water are very important parameter in determining whether or not a spilled hydrocarbon produce will float or sink:

> **21521**. The effects of temperature and salinity in particular do affect things like emulsion formation and that can affect the behaviour of the -- and likelihood of the oil to increase its density or to -- I wouldn't say potentially get to -- it could potentially get to a state where it's overwashed.
> **21522**. My -- the chemistry of the oil can change, and this is again what I was talking about with rates of change and evaporation yesterday. Dissolution would also play a role, photo oxidation would also play a role.
> **21523**. In terms of specific site conditions here, temperature would probably be the most important one in terms of the actual physical changes to the oil, although potential for salinity difference would be important as well.
> **21524**. And maybe my colleague, Dr. Khelifa, can talk more about the particular environmental conditions here.

Dr. Hollebone (EC), Transcript Vol. 167, lines 17230-17231 and 17235-17238
Dr. Hollebone (EC), Transcript Vol. 170, lines 21521 to 21524

1287. When questioned by NG in a manner that sought to compare diluted bitumen to intermediate fuel oil, Environment Canada confirmed that there is not enough known about diluted bitumen to allow such a comparison. Transport Canada deferred to this evidence:

> **25048**. **DR. BRUCE HOLLEBONE:** I would say that you'd want to be very careful taking knowledge that you've obtained from an IFO and transferring it to the context of the dilbit -- of a dilbit; particularly in a -- in a -- if when weathering becomes a problem.
> **25049**. I would not necessarily agree that they would behave the same way in the environment. I think that would get you into trouble.

Dr. Hollebone (EC), Transcript Vol. 172, lines 25048-25049; see also lines 25055-25056
Mr. Roussel (TC), Transcript Vol. 173, lines 25544-25545

2.3.3.4 Uncertainty About Fate and Effects Prevents Reasonable Assessment of Consequences

1288. Federal government scientists have stated unequivocally that more needs to be known about how diluted bitumen will behave when spilled into the environment:

> **21636**. I'd just like to amplify on my colleague's comments that it is not the position of Environment Canada that this product will absolutely sink in any spill. Our statement at this point is that there is this possibility based on the certain characteristics of the material and our position really is that we don't know enough to make that assessment in a quantitative way and so many of our recommendations and many of our future plans for research are aimed at answering those questions.

Dr. Hollebone (EC), Transcript Vol. 170, line 21636

1289. Environment Canada has stated that to understand the effect of an oil spill, one must understand the fate and behaviour of the product, then look at likely or potential exposure, and then one can do more detailed analysis regarding biological effects such as sublethal toxicity, although the research into toxicology could be conducted in parallel with some of the other studies.

Ms. Maclean (EC), Transcript Vol. 167, line 17460 to 17463

1290. Fisheries and Oceans Canada has also stated that understanding the fate and behaviour of the products is an important component in understanding environmental effects. Fisheries and Oceans Canada has stated that it must conduct new research in the future before it will have a scientifically reliable understanding of the pathways of effects for spills in the marine environment for the specific products to be shipped by NG.

Ms. Antcliffe (DFO), Transcript Vol. 167, line 17377
Mr. King (DFO), Transcript Vol. 167, lines 17386-17411

1291. DFO does not have the information it needs to quantify the magnitude and duration of impacts for marine resources in the CCAA and OWA in the event of a spill:

> **17413**. Is it still the opinion of DFO at this time that it is not in a position to quantify the magnitude and duration of impacts for marine resources in the CCAA and OWA in the event of a spill?
> **17414**. **MR. THOMAS KING:** We don't have that information to make a decision on that.

Mr. King (DFO), Transcript Vol. 167, lines 17413 to 17414

1292. Environment Canada has advised the Panel that it has identified information gaps in relation to the fate and behaviour of the products to be transported on the proposed project, and that these gaps relate to how Environment Canada would analyze the consequences of a potential spill.

Dr. Hollebone (EC), Transcript Vol. 171, lines 23612-23614

1293. In addition to questions about how fast the lighter ends of diluted bitumen or synthetic crude will evaporate and increase density, a critical piece of missing information relates to sediments and sediment interactions. The suspended particulate matter concentrations are relevant to understanding whether spilled oil will sink or float. This requires an understanding of what the suspended particulate matter concentrations are in various locations at various times of the year. In addition, sea state is a factor in the oil sediment interaction.

Dr. Khelifa (EC), Transcript Vol. 169, lines 19582-19593 and 19826

1294. Environment Canada has criticized the level of information provided by NG, stating there is very little information about sediment interactions in the data reports provided by NG, that NG has not provided enough information to allow the assessment of sediment spurred sinking of oil droplets, and has not even provided all the data that is already available.

Dr. Hollebone (EC), Transcript Vol. 169, line 19815
Dr. Khelifa (EC), Transcript Vol. 169, lines 19584-19596 and 19604-19606

1295. With respect to whether the products to be shipped on the proposed project will float or sink, Environment Canada has stated that a lot more research and information than has been provided so far is required to understand how fast the products to be shipped by the project will weather to the point that they no longer float. The information that has been filed and discussed does not answer the question whether diluted bitumen will sink or float after weathering in the marine environment.

Dr. Hollebone (EC), Transcript Vol. 169, line 19869
Mr. King (DFO), Transcript Vol. 169, lines 19610 to 19616

1296. Finally, in response to a question from the Panel seeking the opinion about comparisons between effects of diluted bitumen when released to the environment to what is known about effects from spills of other oils, both Environment Canada and Fisheries and

Oceans Canada disagreed that what is known about spills of other oils would apply without qualification to a spill of diluted bitumen:

> **20059**. **DR. CAROLINE CAZA:** I think Environment Canada's perspective on that is that we've made some recommendations for additional information in an area where we see some significant gaps.
> **20060**. So I think we wouldn't be prepared to agree with the statement that says without qualification at this point, recognizing those information gaps in our understanding.

Dr. Caza (EC) and Ms. Antcliffe (DFO), Transcript Vol. 169, lines 2005-20062, but see lines 19943-20063

1297. Federal government scientists – the scientific advisors to the panel – have identified significant gaps in the information provided by NG and available to date, and have provided evidence about the extent to which those information gaps defy reaching conclusions about the effects of a spill of diluted bitumen into the environment. The information gaps have ramifications for mitigation of a spill as well, as they affect how and whether diluted bitumen can be contained and recovered. As a result, the Panel cannot reasonably conclude that there will not be significant adverse effects from a spill of diluted bitumen.

2.3.4 NG's Modelling is Not Reliable

1298. Environment Canada's *Technical Review of NG's Marine Spill Modelling Studies and Related Environmental Consequence Analysis* identified and discussed numerous deficiencies in NG's marine spill modelling. NG submitted a response to the JRP attempting to address the deficiencies. NG's response is inadequate as it does not provide or commit to timely provision of the necessary information that must be considered as a part of the Panel's assessment.

Exhibit E9-32-2
Exhibit B164-13

2.3.4.1 NG Has Not Modelled the Worst Case Volume

1299. The modelling developed described in Exhibit B3-22 is based upon a draft quantitative risk assessment.

Exhibit B3-22, p. 3

1300. NG has confirmed that there was no specific data in terms of detailed engineering drawings or detailed specifications available at the time that the draft quantitative risk assessment was prepared.

Mr. Brandsaeter, Transcript Vol. 161, lines 5976-5978

1301. NG has confirmed that no separate risk assessment had been completed at the time questioning based on the actual design specifications that were available at that time. NG has also confirmed that that the risk levels could increase if the actual specifications provided for greater levels of risk.

Mr. Brandsaeter, Transcript Vol. 161, lines 6002-6003 and 5997-5998

1302. In an application update filed almost two and a half years after the filing of the original application, NG significantly increased the size and capacity of both oil and condensate tanks and the rates at which product would flow in and out of the tanks. NG has failed to provide a risk analysis to assess the impact of these changes on the safe operation of the terminal or the potential volume of any spills that may enter into the marine environment.

B182-2, p. 15-16

1303. The analysis completed in Exhibit B23-34 was used as the basis for calculations relating to the probability, or likelihood, of a hydrocarbon spill occurring at the terminal in Exhibit B23-15 - TERMPOL Surveys and Studies - Section 3.15 - General Risk Analysis and Intended Methods of Reducing Risk.

Exhibit B23-15, p. 64

1304. Exhibit B23-15 states that its objective is to "characterize the risks associated with accidental release events either on route or at the marine terminal site". It further provides that that objective is accomplished by providing information on "credible worst case examples of hydrocarbon spills to develop emergency response planning".

Exhibit B23-15, p. 20

1305. The 250m^3 spill of diluted bitumen modelled at the marine terminal is based on a single loading arm failure. Table 6-14 Distribution of spills from loading/discharge incidents (Source: DNV 2000) provides information on failure frequency based on historical databases from Norway and the UK. The report then provides analysis of potential release volumes relating to the failure of a single loading arm without providing a clear quantitative explanation for why the failure of a single loading arm is the appropriate measure of a spill at the terminal. NG describes the 250m^3 of diluted bitumen spill modelled as a "credible worst-case discharge".

Exhibit B23-34, p. 103-104
Mr. McHugh, Transcript Vol. 142, line 13408

1306. NG has filed conflicting evidence that established that 1,500 m^3 would be the maximum spill size from any tanker loading or unloading at the terminal. The probability of a spill occurring that would result in this volume of release at the marine terminal was not assessed.

Exhibit B69-5, p. 80

1307. NG has confirmed that a spill from the loading or unloading lines that connect the loading arms to the oil and condensate tanks is possible and that it would be possible for such a spill to enter into the marine environment.

Mr. McHugh, Transcript Vol. 142, lines 13467-13472

1308. The spill modelling volume of 250 m^3 for the marine terminal has been treated by NG as a credible worst-case discharge despite NG's own evidence establishing that spills up to 1,500 m^3 are possible. Further, the failure to incorporate specific data in terms of detailed engineering drawings or detailed specifications or to update the risk assessment to consider significant increases in flow rates raises serious concerns about the reliability of the assessment which has been completed and the associated effects assessment premised on those conclusions. The Haisla Nation submits that NG has failed to provide a reliable assessment of a credible worst-case discharge at the marine terminal and any effects assessment premised on a 250 m^3 should be treated as potentially understated and incomplete.

2.3.4.2 NG Failed to Use Stochastic Modelling

1309. NG provided seven marine spill modelling scenarios in the Application and an additional seven opposite-season scenarios as Attachment JRP IR 8.26 (*Exhibits B47-20 to B47-25*). These models were all deterministic models and did not adequately account for the variability of the conditions in the marine ecosystem. The window of environmental conditions considered in the models was limited to one year.

Exhibit B164-13, p. 23
Exhibit E9-32-2, p. 12
Dr. Khelifa (EC), Transcript Vol. 168, line 17990

1310. Stochastic modelling predicts oil trajectory and shoreline oiling considering a wide range (decades) of the uncontrollable variability in environmental conditions, while deterministic modelling addresses oil trajectory considering specific environmental conditions (a few days). Furthermore, outputs of the stochastic modelling are usually used to identify spill scenarios that lead to greatest impact for a given spill volume and location, which cannot be done with the deterministic modelling. These scenarios can then be used for deterministic trajectory and fate modelling to inform spill response planning.

Exhibit E9-32-2, p. 12

1311. Environment Canada, in agreement with the accepted standards used by the oil spill scientific community, stated that the stochastic modelling method should be used to assess the potential environmental consequences of a spill and that the extent of water and shoreline oiling should be assessed using multi-decadal environmental databases for each scenario selected. In this manner, the marine spill scenario with the greatest impact can be identified and properly considered instead of a consideration of uncertainty in deterministic modelling.

Exhibit E9-32-2, p. 12
Dr. Khelifa (EC), Transcript Vol. 168, line 17995

1312. In response, however, NG stated that such modelling was not required for the Panel as it is already established that the environmental effects of a marine oil spill may be adverse and significant.

Exhibit B164-13, p. 23

1313. Establishing that there may be an adverse and significant impact is not enough to conclude that further modelling is not needed. The Panel must make its decision in consideration of the greatest impact marine spill scenario, which can only be obtained through stochastic modelling. If NG's deterministic modelling is evidence that a marine spill will cause adverse and significant impact then there is a greater need for stochastic modelling to determine how much more severe the potential impact to the environment may be.

1314. NG's assertion that a lack of available data makes Environment Canada's recommendation inappropriate is also flawed. A lack of data is not a valid reason to ignore the greatest impact spill scenario. As outlined by Environment Canada, the selection of a one year period (2004) from which weather conditions were sampled and the use of a "single spill from the stochastic model output that is most representative of the overall stochastic result at the release site" were not justified. NG cited lack of availability of multi-decadal wind data.

Exhibit E9-32-2, p. 12
Exhibit B164-13, pp. 23, 48

1315. Environment Canada further explained its concern with NG's approach during oral questioning:

> **18116.** Again, Enbridge, they did stochastic modelling and that was based on 2004 data record. And from that stochastic modelling then, models, deterministic models that they assume that is representative for that period are selected and are presented in the application. That means the oiling, the shoreline oiling, the oil, the fate and behaviour aspect and so on.
> **18117.** So what we recommend we say, okay, maybe it's better to -- it's maybe a good -- may inform the study to use a broader range of weather condition of -- instead of one year perhaps more information, more weather conditions, a couple of decades here and to conduct stochastic modelling.
>
> *Dr. Khelifa (EC), Transcript Vol. 168, lines 18116-18117*

1316. NG holds that the deterministic modelling it has undertaken is sufficient for Panel to review the proposed Project. NG agrees to continue to meet with Environment Canada and develop further stochastic spill modelling post Project approval, but only for the purpose of emergency preparedness and response planning. This timing is inappropriate. The understanding of the greatest spill impact scenario through stochastic modelling is needed by the Panel in its deliberation. Environment Canada made it clear in oral testimony that its recommendations were for informed decision-making by the Panel.

Exhibit B164-13, pp. 24, 29, 31, 34-35 and 40-41
Dr. Caza (EC), Transcript Vol. 168, line 18023

2.3.4.3 NG's Spill Scenario Selection and Methodology Inadequate

1317. Environment Canada's review stated that spill scenarios used by NG are not sufficient to represent high risk spills, either in terms of potential frequency, potential size, or both.

The number and the selection of spill scenarios need to be adequate in order to gain sufficient understanding of relative impact of spill size, types of oil (or hazardous substances) spilled, spill locations, and spill season on the impacts to the environmental and socioeconomic resources. Further, while selected spill scenarios are not expected to be exhaustive, they should provide a wide range of high-risk scenarios with which to evaluate the relative risk and potential impacts to the resources in the study areas should a spill occur.

Exhibit E9-32-2, p. 13

1318. The appropriate spill scenarios should be selected using a risk matrix to determine those spills with the highest potential risk. This method was not used by NG in its application.

1319. NG continues to assert that the conclusion that there would be an adverse and significant risk would not change if the risk matrix approach was used. NG again does not consider that there may be an increased adverse and significant risk that, if present, will be relevant to the Panel's decision.

Exhibit E9-32-2, p. 13
Exhibit B164-13, p. 36

1320. NG agreed with Environment Canada that added considerations of spill modelling using the risk matrix approach may be useful post Project approval, for the purpose of emergency preparedness and response planning. This timing is again inappropriate. The Panel must be provided with representative information on potential marine spill scenarios that can only be generated by additional modelling prior to the Panel's decision. Such additional modelling should be conducted using stochastic modelling (see para. 1311 above).

Exhibit B164-13, pp. 25-26 and 33

2.3.4.4 NG Has not Considered the Full Suite of Condensates

1321. NG has modelled only one type of condensate. As with the diluted bitumen and crude oil products NG intends to ship, condensates can have varying compositions. Condensate tariffs outlining the range of products that can be shipped have not prepared for the proposed project; however, NG's statements and predictions rest on their model being representative of all potential condensate received and shipped.

Mr. McHugh, Transcript Vol. 141, line 13094
Mr. Milne, Transcript Vol. 141, line 13227
Exhibit B23-15, pp. 254-259

1322. NG has not provided information on the actual range of condensates it will ship, but has acknowledged that a range of condensates may be transported as a part of the project. Further, NG conceded that the allowed range within the tariff could result in lighter or heavier condensates than the one modeled being received and shipped.

Mr. McHugh, Transcript Vol. 141, line 13083
Mr. Belore, Transcript Vol. 141, line 13188

1323. In addition, NG has not provided information on how these other condensates will behave upon being spilled into the marine environment. When questioned about the behaviour of condensate in the event of a spill, NG repeatedly only referenced the general behavioural principles of a lighter product than diluted bitumen with increased dispersion and evaporation.

Mr. McHugh, Transcript Vol. 135, line 4402
Mr. Belore, Transcript Vol. 136, lines 4808 and 5452

1324. NG has not filed modelling evidence on the range of condensate products, instead choosing to hypothesize on theoretical grounds in oral testimony on the behaviour of other condensates.

Mr. Belore, Transcript Vol. 141, lines 13104-13105

1325. NG confirmed in oral testimony that Methanex, in contrast, in its spill behavior modelling, modeled 2 condensates, "heavy" and "light", that have API gravities of 46 and 60 respectively.

Mr. Belore, Transcript Vol. 141, lines 13136-13139

1326. These values are not far apart from one another; yet they still cause the condensates to behave quite differently once spilled. Testimony affirmed that the difference in API values resulted in differences in dispersed oil cloud and persistence time.

Mr. Belore, Transcript Vol. 141, lines 13154, 13156, 13175 and 13203

1327. NG's model only considered a lighter condensate (with API 61) and thus underestimated effects since heavier condensates (still within NGP's likely tariff range) produce larger slicks and larger clouds (underwater dispersion). As a result of this increased dispersion, NG has under-represented the risk to aquatic organisms in the event of a condensate spill due to failure to consider the range of condensates the could be shipped on the proposed project and their different behaviours.

Mr. Belore, Transcript Vol. 141, line 13125
Dr. Stephenson, Transcript Vol. 141, line 13220

1328. NG does not have Material Safety Data Sheets (MSDS) for the condensate it expects to receive at the marine terminal. NG was only able to provide the MSDS sheet for condensate currently shipped in the Enbridge system. NG was unsure which MSDS they would be using at the time of the project. This is further evidence that NG has not given the necessary thought and consideration to the range of condensates that will be received and shipped.

Exhibit B200-2
Mr. Milne, Transcript Vol. 139, lines 10338-10339
Mr. Milne, Transcript Vol. 140, line 10623

2.3.5 Toxicological Impacts Not Properly Assessed

1329. In addition to failing to conduct the modelling required to understand the consequences of a spill into the marine environment, NG has failed to properly assess the toxicity of oil to fish and other aquatic biota.

1330. As set out in the section examining the assessment of toxicity of oil spilled from the proposed pipelines, NG has not provided a reliable assessment of the toxicity of oil to fish. The shortcomings of NG's assessment are set out in detail at paras. 948 to 992, above, and will not be repeated here.

1331. The concerns identified by the Haisla Nation with respect to the samples analyzed, the pathways of effects considered, and the dismissal of chronic effects apply equally to marine spills as they do to pipeline spills.

1332. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment at the proposed terminal is not reliable because it does not consider the full range of products that could be shipped on the proposed project.**

1333. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment at the proposed terminal is not reliable because it does not consider all the potential pathways of effect.**

1334. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment at the proposed terminal is not reliable because it does not fully consider chronic toxicity.**

2.3.6 Human Health Risk Assessment Inadequate

1335. NG has prepared a human health risk assessment which evaluated the nature and likelihood of adverse health effects in humans who may be exposed to chemicals based on hypothetical hydrocarbon spill examples at the Kitimat Terminal and during marine transportation through Wright Sound.

Exhibit B16-33, p. 17

1336. The human health risk assessment concludes that there will be no adverse effects on human health.

Exhibit B16-33, p. 5

1337. The Haisla Nation submits that the human health risk assessment has been prepared on the basis of faulty assumptions by failing to seek and obtain reliable empirical information and by considering only a single pathway of effects. Further, the human health risks assessment relied on the analyses of the effects of the composite sample of the three oil NG determined to be "representative" of project oils. As set out in paras. 952 to 966 above, these "representative" oils do not reflect the full range of toxicity of the products that could be transported on the proposed project, resulting in an underestimation of risk.

1338. NG has suggested that the human health risk assessment is based on conservative assumptions, by discussing the uncertainties in the assumptions under a section titled "Conservative Assumptions in the Exposure Assessment". During oral questioning, NG admitted that some of these assumptions were not necessarily conservative, but could over- or **underestimate** risk. The section would more appropriately have been titled "Uncertainties in the Exposure Assessment". Calling it "Conservative Assumptions … misrepresents the extent to which some of these assumptions are uncertainties that either over- or underestimate risk.

Exhibit B16-33, p. 71
Mr. Yee and Dr. Stephenson, Transcript Vol. 140, lines 10665-10736

1339. Haisla Nation members rely on country foods for their health and well-being. Haisla Nation members understand their diets and the consumption of country food to be directly associated with their health and well-being:

> My diet consists of mainly seafood, so if I was to lose this source of diet, I believe that my wellbeing would deteriorate because my body is used to traditional foods.

Exhibit D80-23-3, Affidavit of Mary Muriel Green, p. 23, para. 9

> I live off the land as much as I can because with the diet we how have today which was introduced to us from first contact, we as a family are now suffering from Diabetes, Rheumatoid Arthritis, Cancer and so on.

Exhibit D80-23-3, Affidavit of Trevor Amos, p. 67, para. 8

1340. NG has admitted that 8 of the chemicals to be transported by NG are cancer causing.

Dr. Stephenson, Transcript Vol. 139, line 10473-10475

1341. Ingestion of seafood was the only pathway of effect that NG considered for human health impacts from a spill to the marine environment at the marine terminal or at Wright Sound. It did not, for example, integrate potential exposure due to inhalation.

Dr. Stephenson, Transcript Vol. 139, line 10511
Mr. Yee, Transcript Vol. 140, line 10661

1342. The human health risk assessment relied upon data from Health Canada concerning fish consumption by aboriginal communities. NG failed to take the obvious and necessary step of confirming with the Haisla Nation that the consumption rates in the study were accurate for the Haisla Nation population.

Mr. Yee, Transcript Vol. 140, lines 10744 and 10755

1343. NG also assumed that there was a 50/50 split in consumption between fish and shellfish. NG was unable to confirm that the 50/50 split in consumption between fish and shellfish was accurate for the populations of First Nations that might be affected by a spill of NG product.

Mr. Yee, Transcript Vol. 140, lines 10757 and 10776-10777

1344. NG failed to approach Health Canada, DFO or AANDC to confirm whether unpublished data was available concerning ingestion rates of shellfish or mollusks. NG has admitted that actual first-hand data from the individuals or communities that might be affected in the event of a spill would improve estimates of risk, but was not diligent in obtaining it and merely relied on Health Canada's estimates.

Mr. Yee, Transcript Vol. 140, lines 10787 and 10789
Mr. Yee, Transcript Vol. 140, lines 10795-10796

1345. NG failed to assess the potential human health effects from the ingestion of contaminated seaweed. NG may have falsely eliminated this as a pathway of effect by assuming that the consumption rate would be the same as medicinal plants in aboriginal populations based on the prairies. Haisla Nation members consume seaweed as part of their primary diet.

Mr. Yee, Transcript Vol. 140, line 10831
Exhibit B38-9, p. 15, NGP Response to Gitxaala IR No. 1.1.19
Exhibit D80-23-1, Affidavit of Mike Jacobs, p. 3, para. 8, and p. 3, para. 14
Exhibit D80-23-2, Affidavit of Haisla Members 1, pp. 6, 8, 66, 80, 81, 88
Exhibit D80-23-3, Affidavit of Haisla Members 2, pp. 8, 28, 33, 43, 50, 76
Exhibit D80-34-2, Affidavit of Thomas Gregory Robinson, p. 3
Exhibit D80-32-2, Affidavit of Nina Shaw, p. 2

1346. In assessing toxicity NG has relied on toxicity reference values derived from testing on animals that have limited lifespans which are not comparable to human lifespans. The longest toxicity study referenced was approximately two years. Haisla Nation members rely on seafood for their lieftime.

Mr. Yee, Transcript Vol. 140, lines 10901-10910

1347. NG agrees that a traditional food diet is important to the health of Aboriginal people.

Mr. Yee, Transcript Vol. 140, line 10986

1348. NG has also provided evidence that traditional foods are important nutritionally, taste-wise and socio-economically. NG recognizes that there are health advantages associated with a diet based on country foods and acknowledges that country foods have tremendous, wonderful, nutritional value and they're an extremely important part of the overall health of First Nations people.

Mr. Wooley, Transcript Vol. 140, line 11071
Dr. Stephenson, Transcript Vol. 140, lines 11078 and 11093

1349. The human health risk assessment does not examine any potential human health impacts that may flow from a ban on harvesting and consumption of seafood during a spill and clean up-phase or from avoidance. NG acknowledges that a spill from the Northern Gateway project could disrupt subsistence fishing and harvesting.

Exhibit B16-33 (generally)

Mr. Yee, Transcript Vol. 140, lines 10798-10799
Dr. Stephenson and Mr. Wooley, Transcript Vol. 140, lines 10582-10854
Mr. McHugh, Transcript Vol. 140, lines 11006

1350. NG has noted that following the Exxon Valdez spill traditional food was scientifically determined to be safe for human consumption but there was continued distrust on the part of local populations. NG acknowledges that a spill from the Project could result in First Nation communities in the project area turning to store-bought foods to replace traditional foods in their diets.

Dr. Maki, Transcript Vol. 140, line 11019
Mr. Carruthers, Transcript Vol. 140, line 11024

1351. NG has provided evidence that some types of losses which may be characterized as cultural are not necessarily quantifiable and may not be compensable.

Dr. Ruitenbeek, Transcript Vol. 140, line 11138

1352. NG is aware of past contamination of Haisla Nation traditional food sources and recognizes the burdens associated with acquiring replacement foods from greater distances.

Dr. Pearson & Mr. Carruthers, Transcript Vol. 140, lines 11149-11158

1353. NG has acknowledged the value of country foods to the health of First Nations and has confirmed that contamination may result in First Nations turning to store-bought foods to replace traditional foods in their diets. In the event of a spill, the reliance of the Haisla Nation on marine resources for food and culture will be impaired and the indirect effects may be significant. It is not possible for the Panel to assess the potential indirect effects of contaminated country foods on the health of the Haisla Nation based on the materials filed by NG because NG has not assessed those impacts as part of the human health risk assessment. By failing to include an assessment of the potential impacts on Haisla Nation health occurring from inhibited reliance on traditional foods, NG has neglected to assess significant impacts and has shown a lack of understanding and disregard for the unique ways in which a spill may affect the Haisla Nation.

1354. The human health risk assessment is premised on unreliable assumptions and NG failed to improve the reliability of their assessment by seeking out empirical data or alternative sources of information. The human health risk assessment also fails to assess the indirect effects of a spill on human health. The Haisla Nation submits that the human health risk assessment should be given limited weight by the Panel in its assessment of the Project effects.

2.4 NG is Overstating its Ability to Mitigate Spills Through Spill Response

1355. The third component NG relies on to suggest that the adverse environmental effects of a spill are not significant is mitigation of effects through spill response. NG has not demonstrated that it will be able to respond effectively to a spill, particularly not to a spill of diluted bitumen.

2.4.1 NG Oil Spill Contingency Planning: Promises, Pretty Concepts and Prolonged Delay

1356. The proposed project will transport diluted bitumen, synthetic crude and condensate via pipeline across Alberta and British Columbia, store products at a marine terminal at the pipeline terminus in Kitimat, and ship oil and condensate via marine tankers from and to Kitimat, BC. As it is impossible to eliminate the risk of oil spills from such operations completely, NG has the potential to release any of these substances to freshwater, marine waters, mixed-salinity estuarine waters, soils, and both inland and coastal shoreline.

Exhibit D80-27-09, p. 7

1357. NG assumes that all areas along the Northern and Southern Approaches are at risk of being oiled in the event of a spill.

Exhibit B3-37, p. 18

1358. NG has made numerous promises in relation to spill response and oil spill contingency planning. NG has a policy to operate in a manner designed to prevent incidents and implement emergency response to contain, remove and restore affected areas.

Exhibit B3-37, p. 33

1359. NG has also made numerous promises to take various spill response and oil spill contingency planning actions following the completion of the JRP process, including commitments to:

- establish operational safety limits for visibility, wind and sea conditions;

  Exhibit B3-37, p. 33

- complete project-specific emergency response plans;

  Exhibit B3-37, p. 35

- complete operational spill response plans;

  Exhibit B21-2, p. 13

- include best practice oil spill response protocols in site-specific marine Geographic Response Plans and terrestrial Watercourse Tactical Plans; and

  Exhibit B83-2, p. 19

- work with local communities to complete Geographic Response Plans.

  Exhibit B83-2, p. 20

1360. NG has also identified key concepts for spill response, including:

- Protect the public and responders.
- Protect the environment.
- Protect corporate assets.

- The response capability in place should be risk based and represent best practices for spill response.
- The oil spill response command and control system should be organized consistent with the fundamental principles of the incident command system (ICS).
- Opportunities for mutual aid should be pursued.
- A tiered response system that provides consistent, organized and steady use of resources and equipment of sufficient scale should be applied.
- Input from regulators, local residents, Aboriginal groups and other stakeholders on relevant information, concerns and priorities should be obtained.
- Oil spill response actions should be planned and executed using the most appropriate technology and equipment, based on recommendations from qualified experts, recognizing that safety of the public and responders is the highest priority.

Exhibit B21-2, p. 23

1361. NG has examined the potential pathway and dispersal of hypothetical hydrocarbon spills at the tank and marine terminals and the potential effects of a spill on the biophysical and socio-economic environment, including identifying follow-up and monitoring.

Exhibit B3-22, p. 3

1362. NG acknowledged that an unmitigated hydrocarbon release could have acute (immediate) and chronic (months to years) effects on the health of wildlife, fish and humans, and could reduce habitat quality.

Exhibit B3-22, p. 13

1363. When assessing the potential effects of a spill from the terminal NG has assumed that mitigation and emergency responses have occurred.

Exhibit B3-22, p. 14

1364. NG has also confirmed that it intends to rely on the measures in the Marine OSRP serve to mitigate the effects of a spill from a project-related tanker.

Exhibit B3-37, pp. 24 and 35

1365. NG is relying on oil spill response measures to mitigate the effects of a spill. NG identifies the Marine Oil Spill Response Plan (OSRP) and the Oil Pollution Emergency Plan (OPEP) emergency response actions as available to mitigate the effects of a release from the marine terminal on the marine environment.

Exhibit B3-22, p. 30

1366. NG has identified the following key response actions:

- safety
- notification (fire, police and emergency response)
- incident management
- source control
- assessment

- containment, recovery and protection strategies
- equipment deployment
- wildlife protection
- cleanup and decontamination
- demobilization and emergency response conclusion

Exhibit B3-22, p. 30

1367. NG claims to have based its proposed project on a vision of world-class response capability. The materials provided to date by NG do not demonstrate world-class response capability. The Haisla Nation submits that NG has not given enough thought to spill response and the particular challenges associated with the proposed project to merit a world-class designation.

Exhibit B21-2, p. 15

1368. The materials, promises, concepts and timelines put forth by NG have not been independently assessed by any independent third parties and do not benefit from any other form of independent corroboration.

1369. The Haisla Nation has secured the expert assessment of NUKA Research and Planning Group, LLC (NUKA Research) to evaluate the NG submissions concerning oil spill contingency planning. NUKA Research has prepared two reports to support the Panel in its assessment of the proposed Project: Exhibit D80-27-09 *Preliminary Analysis and Observations regarding Enbridge Northern Gateway Project Proposal Documents – Oil Spill Contingency Planning* (NUKA Oil Spill Contingency Planning Assessment) and Exhibit D80-56-3 *Oil Spill Response Gap and Response Capacity Analysis for Proposed Northern Gateway Tanker Oil Spills in Open Water and Protected Water Operating Environments*.

Exhibit D80-27-9 (generally)
Exhibit D80-56-3 (generally)

1370. NUKA Research, in its expert assessment, has concluded that the NG submission documents do not represent a cohesive, risk-based approach to oil spill mitigation, prevention, preparedness, and response. The documents submitted for the project do not provide sufficient information to evaluate the project's potential to cause unmitigated adverse impacts. The submission relies on faulty assumptions regarding potential fate and effects of a diluted bitumen spill, and does not reflect a thorough review or analysis of relevant published research. Despite the fact that NG has spent many months cleaning up a diluted bitumen oil spill, the submission does not synthesize or even acknowledge many of the key lessons learned during the Kalamazoo River spill.

Exhibit D80-27-9, p. 7

2.4.1.1 Product Fate and Behaviour Not Understood

1371. The fate and behaviour of the products likely to be transported on the proposed project is not well understood. The extent of this lack of understanding is discussed in paras. 1249 to 1297 above.

1372. Sediment interaction is an important aspect of the fate and behaviour of spilled oil, and NG has not adequately considered how sedimentation will impact the fate and behaviour of spilled oil.

1373. NG's ESA for the Marine Terminal has conducted some analysis of the impact of increased sedimentation that will result from the blasting and dredging required at the site, as set out at paras. 1165 to 1174, above. The ESA relies on the high background levels of sedimentation at the proposed marine terminal site to conclude that the sedimentation caused by construction will not be significant. The Haisla Nation has set out the basis for its disagreement with this conclusion above. NG's determination that the sedimentation caused by construction will not be significant is based in part on the ambient levels of sedimentation as a result of Kitimat River outflows. Sediment loads will exist in the Upper Kitimat Arm and likely throughout the CCAA. We just do not know what those levels will be.

1374. Environment Canada has stated that NG has not provided enough information to allow the assessment of sediment spurred sinking of oil droplets and has not even provided all the data that is already available. Environment Canada has also stated that there is very little information about sediment interaction in the data provided by NG.

Dr. Khelifa (EC), Transcript Vol. 169, lines 19584-19596 and 19604 to 19606
Dr. Hollebone (EC), Transcript Vol. 169, line 19815

1375. NG has contributed to the inability to understand how spilled oils will behave by failing to consider oil sediment interactions and provide information relevant to such an assessment.

2.4.1.2 NG has Failed to Consider Sunken and Submerged Oils

1376. Hydrocarbons behave in different ways when spilled to land or water, depending on the chemical composition and the environment to which it is spilled. It is critical to garner the best possible understanding of how a potential spill could behave in order to plan and prepare for an effective response. In particular, it is important to anticipate whether the spilled oil will float, submerge, or sink, and over what time periods and in what conditions. Sunken or submerged oils pose different environmental risks and require different oil spill containment and response strategies.

Exhibit D80-27-09, p. 7

1377. The state of knowledge for responding to spills of heavy oils is in its infancy. The state of knowledge for responding to spills of diluted bitumen is embryonic.

Exhibit D80-27-09, p. 14

1378. The evidence of Environment Canada establishes that based on the current state of knowledge it is very difficult to assess whether the product to be shipped by NG will sink.

Dr. Hollebone (EC) Transcript Vol. 170, lines 21635-21638

1379. In response to questioning concerning response capacity to address the possibility that products from the Project will sink or submerge, Transport Canada has provided

evidence that it will be necessary to gain a better understanding of the product and its behaviours in the marine environment. Transport Canada further notes that the prediction models possessed by Transport Canada are based on conventional oils making it difficult to extrapolate the fate and behavior or the product in the marine environment.

Mr. Kidd (TC), Transcript Vol. 171, lines 22738-22741

1380. The challenges in predicting the fate, behavior, and transport of heavy oil spills are also well established in the published literature. NUKA Research has cited BMT Cordah Ltd., February 27, 2009. RP595 *Sunken and Submerged Oils – Behaviour and Response. Report for the Maritime and Coast Guard Agency*, pp.1---148 and Michel, J., 2006. *Assessment and Recovery of Submerged Oil: Current State Analysis.* Prepared for the United States Coast Guard, Research and Development, Groton, CT, pp. 1---47 as pertinent literature in this respect. NG has also identified these materials as instructive.

Exhibit D80-27-09, p. 39
Exhibit B83-16, p. 29

1381. NUKA Research has also noted that outside of the reports generated during the Kalamazoo River spill, there is virtually no information published in the oil spill literature about diluted bitumen spill fate and behavior, impacts, or response. The 2010 Enbridge pipeline spill in Michigan underscores how little is known about diluted bitumen spills. Cleanup was still in progress 17 months (now 35 months) after the spill occurred, in large part because it is difficult to model the movement of submerged and sunken oils – the oils that, NG has represented to this Panel, will not sink. I; it is extremely difficult to detect areas of submerged oil; and cleanup of submerged oil from rivers and riverbanks is a cumbersome, time-intense, inefficient process.

Exhibit D80-27-09, p. 39

1382. NUKA Research has noted that in the absence of experience dealing with diluted bitumen spills in the marine environment the closest analogue is heavy fuel oils as they mimic what little understanding currently exists regarding the behavior of diluted bitumen.

Ms. Decola, Transcript Vol. 164, line 11851

1383. Diluted bitumen is a heavy oil, and predicting the behavior of heavy oils spilled to marine or freshwaters is complex. Many examples exist of heavy oil spills where the product submerged or sank. Table 5. 1 of the NUKA Oil Spill Contingency Planning Assessment provides numerous examples.

Exhibit D80-27-09, pp. 81-85

1384. Despite Enbridge's direct responsibility for the big spill in Kalamazoo and participation in clean-up and response operations relating to submerged and sunken diluted bitumen, NG has formulated its entire marine spill response approach on the understanding that, with limited exception, the product that will be shipped will float:

> **8228.** So, the recovery strategies that Northern Gateway is proposing, am I correct that those recovery strategies are all premised on the assumption that the oil will float?

> **8229. DR. EDWARD OWENS:** They are based on the premise that the oils that would be transported from the terminal will float, with the one exception -- as I just mentioned -- where oil might make contact with shoreline sediments and therefore increase the density.
>
> *Dr. Owens, Transcript Vol. 138, lines 8228-8229*

1385. Environment Canada has confirmed that there is an information gap and further studies need to be undertaken to assess whether or not the product to be shipped by NG will sink or submerge.

Dr. Hollebone (EC), Transcript Vol. 170, lines 21650-21654

2.4.1.2.1 NG Is Not Prepared to Locate or Contain Submerged Oil

1386. Responders must know where the oil is in order to contain and recover it. Surveillance is typically conducted by trained personnel looking for the oil from an aircraft, vessel, or land. As with other aspects of a response, the methods used depend on whether the oil floats or submerges or sinks. The latter options make the spilled oil much harder to find, and require special equipment and techniques. Other properties of diluted bitumen make many commonly used spill surveillance techniques and technologies less effective or inappropriate.

Exhibit D80-27-09, pp. 14-15

1387. NG agrees that submerged oils are more challenging to track and locate than floating oils

Mr. Underhill, Transcript Vol. 96, lines 19871- 19872

1388. Environment Canada has confirmed that subsurface currents may play a large role in determining where submerged oil may go.

Dr. Hollebone (EC), Transcript Vol. 170, lines 21583-21584

1389. A remote sensing expert from Environment Canada has confirmed that there are challenges associated with observance of slightly submerged oils from the deck of a vessel.

Dr. Brown (EC), Transcript Vol. 170, lines 21558-21559

1390. Containing submerged oil is more challenging than when the oil floats, and requires different equipment and techniques. Recovery of submerged oil on the bottom requires multiple systems for picking up the oil, separating the oil, water, and sediments, and treating the waste streams. Different techniques have been used, with varying success. Nearly all are extremely labour intensive. One commonality among most submerged oil detection, containment, and recovery methods is that they are extremely intrusive. Some techniques may actually cause more harm than good, and ecological risk assessment is a component of submerged oil response operations that should be addressed in the planning phases.

Exhibit D80-27-09, p. 15

1391. According to a 2006 report commissioned by the U.S. Coast Guard:

> Spills of nonfloating oil pose special challenges during all phases of an emergency response. Nonfloating oils are difficult to track and locate. There are no proven containment methods for either oil suspended in the water column or deposited on the seafloor; underwater recovery methods are complex, expensive and inefficient; the oil is often viscous making it difficult to pump; and large volumes of water and/or sediment usually must be handled during recovery and disposal. As is the case for all oil spills, every submerged oil spill is a unique combination of conditions based on oil type and behaviour, environmental setting, and physical processes.[165]

Exhibit D80-27-09, pp. 77-78

1392. Following its big spill in Kalamazoo, Enbridge removed submerged oil by dredging, excavating, and aeration. Nearly two years after the accident, crews were still removing submerged oil and contaminated soils miles from the release site. Nearly 3 years after the accident, the EPA issued an order for ongoing cleanup.

Exhibit D80-69-3, pp. 102 and 144
United States EPA Region 5, Order for Removal under Section 311(c) of the Clean Water Act, Docket No. CWA 1321-5-13-001

1393. NG agrees that sunken or submerged oils pose different response challenges than floatiing oils.

Mr. Underhill, Transcript Vol. 96, lines 19869-19870

1394. NUKA Research has cited examples of positively buoyant parent oils that, upon being subjected to weathering, submerged. This impaired detection prevented the application of skimmers and enhanced the challenges of oil spill response.

Ms. Decola, Transcript Vol. 164, lines 11846-11847

1395. NG has tried to downplay the need for submerged oil response equipment in the marine environment, underlining its lack of understanding of the challenges associated with a spill from the proposed project.

Mr. McHugh, Transcript Vol. 138, lines 8205-8207

1396. Transport Canada has confirmed that it has not developed response plans that outline how to respond to a product from the proposed project that will sink or submerge, and is instead seeking to understand how the products will behave. Further, the Canadian Coast Guard has no experience cleaning up heavy oil that has sunk.

Mr. Kidd (TC), Transcript Vol. 171, lines 22736-22741
Mr. Murdock (CG), Transcript Vol. 169, line 20306 to 20307

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[165] Michel, J., 2006. Assessment and Recovery of Submerged Oil: Current State Analysis. Prepared for the United States Coast Guard, Research and Development, Groton, CT, pp. 1---47. Reference available at Exhibit D80-27-09, p. 113. The report was updated in 2011. See Dr. Taylor, Transcript Vol. 91, line 13522.

1397. NG has also confirmed that mechanical burning and dispersant use at the surface would not be appropriate for oil that sinks. Dispersant application and bio-remediation should not be relied on as part of the mitigation tool-kit to deal with diluted bitumen.

Mr. McHugh, Transcript Vol. 139, lines 10075-10076
Dr. Short, Transcript Vol. 175, lines 28689-28690

1398. The presumption that the product will float has limited the scope of the assessment of potential impacts of the proposed project in the event of a spill. NG has not addressed large amounts of submerged oil or sunken oil.

Mr. McHugh, Transcript Vol. 139, lines 10077-10082

1399. A major deficit that pervades all of the NG oil spill planning is the presumption that all spills will involve floating oil. Submerged and sunken oil spills must be examined in terms of potential fate and effects, risks to the environment and ecology, mitigation measures to reduce the adverse impacts, and response systems to manage the unique response challenges.

Exhibit D80-27-09, p. 17

2.4.1.2.2 NG Has Not Learned its Lesson from Kalamazoo

1400. On July 25, 2010 Enbridge Line 6B, which transports diluted crude oil extracted from the Alberta oil sands, ruptured and released 3,750,000 liters of oil. Estimated clean-up costs had reached $767million by July of 2012, and are still increasing.

Exhibit D80-69-3, p. 144

1401. Once the crude oil mixture entered the water, weathering, volatility, and physical agitation caused the denser oil fraction to sink and incorporate into river sediments and collect on the river bottom.

Exhibit D80-69-3, pp. 101-102

1402. In the NTSB's report examining the spill identified the inadequacy of Enbridge's facility response plan to ensure adequate training of the first responders and sufficient emergency response resources allocated to respond to a worst-case release as a safety issue. NG accepts responsibility for what happened during the big spill in Kalamazoo and accepts the findings of the NTSB Report.

Exhibit D80-69-3, p. 38
Mr. Baumgartner, Transcript Vol. 96, line 19415 & 19441

1403. Submerged oil detection and recovery was by far the most challenging element of the Kalamazoo spill. While novel techniques were developed, this was a slow iterative trial-and-error process. Techniques were labour-intensive and primarily manual. Some scaling was done once basic techniques had been developed, but a great deal of time was lost to trial and error.

Exhibit D80-27-09, p. 135

1404. One of the outcomes from the big spill in Kalamazoo was to include in response plans the strategies and tactics for addressing oil that is not floating.

Dr. Taylor, Transcript Vol. 91, line 13468

1405. NG has filed Exhibit B132-5 *Enbridge. 2011a. Operating and Maintenance Procedures Book 7: Emergency Response. Annual Update Version 9, Section 04-02-11* and Exhibit B132-6 *Enbridge. 2011b. Submerged Oil Recover Plan.*

Exhibit B132-5 (generally)
Exhibit B132-6 (generally)

1406. NG has also filed Appendix D to Exhibit B83-16 *Appendix B to the Preliminary Kitimat River Drainage Area Emergency Preparedness Report, Attachment 7 to Northern Gateway Reply Evidence dated July 20, 2012*. Appendix D notes "[i]t is not the intent of this Appendix to provide detailed response tactics. Northern Gateway will continue to review and refine tactics to respond to submerged and sunken oil."

Exhibit B83-16, p. 29

1407. NG has agreed that there is a need for improving the countermeasures that are available for dealing with submerged oil.

Mr. Underhill, Transcript Vol. 92, line 13639

1408. NG says that it has learned lessons learned from Enbridge's big spill in Kalamazoo, and other incidents where oil has been observed to submerge, will be incorporate these into operational NG response plans.

Exhibit B74-2, p. 28

1409. However, exhibits B132-5, B132-6 and B83-16 are all focused primarily on river context and **offer no tactical or management strategies** to address sunken or submerged oils specific to the marine environment context.

Exhibit B83-16, Appendix D (generally)
Exhibit B132-5 (generally)
Exhibit B132-6 (generally)

1410. Further, many of the tactics described in these documents would be completely inappropriate for the marine context. For instance, Appendix D Submerged and Sunken Oil Response Tactics lists three response measures in Table D-3; Air Curtains/Barriers, Net Booms and Silt Curtains.

Exhibit B83-16, p. 33

1411. Air curtains/barriers have operational limitations to water depths less than 5ft, net booms will only work in low-flow areas such as dead-end canals and piers and silt

curtains are limited to depths of 5-10ft and are meant for still water bodies such as lakes or dead-end canals.

Exhibit B83-16, p. 33

1412. Similarly, the response measures identified in Exhibit B132-5 refer primarily to submerged oil mobilization measures which are either hand held or vessel mounted which suggests limited depth deployment. The methods also rely on the establishment of collection points at the downstream end of each work area which would not be easily accomplished in the marine environment.

Exhibit B132-5, p. 2

1413. Exhibit B132-5 also describes dredging as a possible response measure noting that it is an "aggressive recovery technique" and further explaining that the "use of this technique disrupts and destroys the existing habitat." Further it is identified as an effective measure for circumstances where the "oil is deposited at deeper water depths that limit or restrict other techniques" which suggests that many other techniques would not be available at the depths present in the marine environment.

Exhibit B132-5, p. 3

1414. Lastly, the Submerged Oil Recovery Plan filed as Exhibit B132-6 is premised on the prioritization of submerged oil sites using fluvial geomorphology and the identification of downstream barriers that could limit downstream mobility.

Exhibit B132-6, p. 3

1415. Many of the methods described in Exhibit B132-6 for submerged oil mobilization require hand held manual operation (raking, hand held tiller, hand held stinger or are vessel mounted (vessel mounted water or air injector, vessel mounted pipe drag, rotating stingers). These approaches may be ineffective in the marine context due to depth and a lack of clear collection points.

Exhibit B132-6, pp. 8-15

1416. In the marine context, NG has refused to engage in informed discussions of appropriate spill response measures for sunken or submerged oils away from shorelines. During oral questioning, NG repeatedly deflected questions concerning oil spill response measures relating to sunken or submerged oil in the marine context. The limited and preliminary plans that NG has filed with the Panel in relation to marine spill response are premised on the assumption that oil spilled will float with the limited exceptions of oils interacting with shoreline sediments. The NG witnesses refused to give straight answers to questions relating to measures to respond to sunken or submerged oils in the marine context when provided the opportunity through questioning.

Dr. Owens, Transcript Vol. 138, lines 8221-8223 and 8229
Mr. McHugh, Transcript Vol. 138, lines 8207, 8235 and 8246
Mr. Belore, Transcript Vol. 138, line 8209

1417. If the big spill in Kalamazoo had occurred in a more open system (tidal inlet, estuary, bay) with multi-directional transport and currents and deeper water, it would have been nearly impossible to find most of the spilled oil.

1418. Based on a detailed review of the incident---specific documentation for the Enbridge Line 6B release, and conversations with spill response professionals involved in the response, NUKA Research observed that the oil spill contingency plan for the pipeline segment that spilled had no reference to sunken oil, vastly overestimated the ability to detect and shut down a spill, and underestimated the potential worst case. It does not appear that the contingency plan was utilized at all during the response.

Exhibit D80-27-09, p. 136

1419. NG has confirmed that the techniques described in Exhibit B132-6 for sunken oil were not evaluated in terms of being used in British Columbia. NG has also stated that many of the techniques are new.

Mr. Underhill, Transcript Vol. 92, lines 13578- 13583

1420. Environment Canada has also confirmed that the effectiveness of any techniques for recovery or mitigation options for sunken oils that were developed in Kalamazoo for the CCAA and the OWA are not known and have not been applied or assessed in the environmental or geographical context of Project.

Dr. Hollebone (EC), Transcript Vol. 170, lines 21719-21723

1421. NG has displayed a concerning level of willful blindness about the possibility that oil spilled into the marine environment will sink or submerge, and an unwillingness to assess and prepare for that possibility. As set out above, Environment Canada has testified that the state of knowledge concerning the fate and behavior of diluted bitumen is limited and that it is not possible determine based on the science that is currently available whether diluted bitumen will sink or submerge if released into the marine environment in conditions such as those present in the CCAA and the OWA.

2.4.1.2.3 Nighttime Response Will Impair Response Effectiveness

1422. NG has stated that the NG response organization will be capable of engaging in response 24-hours a day. However, NG has also noted that responding could be limited to **simple monitoring** in some circumstances. Monitoring is not active response.

Mr. McHugh, Transcript Vol. 138, line 8358
Dr. Owens, Transcript Vol. 140 lines 11316-11321

1423. NG has made reference to the response organization Western Canada as an example of a 24-hour operational period. However, NG does not have any plans in place to contract with Western Canada.

Mr. McHugh, Transcript Vol. 138, lines 8338-8339

1424. NG has noted that it is more difficult to work at night and it is less safe to work at night.

Dr. Owens, Transcript Vol. 138, line 8335

1425. NUKA Research has described on-water recovery at night as difficult and potentially dangerous at best. NUKA Research also provided evidence concerning a consensus report completed by industry and spill response operators (including some of the consultants who have appeared as witnesses before the Panel) noting that the report found that night time operations are not recommended or encouraged.[166]

Ms. Decola, Transcript Vol. 164, lines 11981-11985

1426. NG has admitted that there are a lot of tactics that are not readily achievable or even efficient at night time and has noted the use of dispersants from an airplane as an example.

Dr. Owens, Transcript Vol. 138, line 8383

1427. NG has acknowledged that it may not be appropriate to try and apply dispersants at night or to conduct major in situ burning at night.

Mr. McHugh, Transcript Vol. 138, line 8452

1428. NG has professed that the NG response organization will be capable of 24-hour response. TO NG, however, the term "response" simple monitoring. In the absence of a detailed assessment of the actual response capabilities and efficiency of those capabilities in the marine environment in the Project area actual value of that capability remains very much in doubt. NG has listed various limitations on response capabilities in the nighttime context. The commitment to have 24-hour response capabilities does not overcome the significant impacts that reduced visibility may have on response operations.

2.4.2 Response Gaps and Response Capacity Gaps

1429. A spill response is subject to the potential impact of hundreds of factors that can impede or limit the response effectiveness. Effective spill response requires a detailed and realistic plan to ensure that the necessary personnel are available and appropriately trained, the proper equipment is on-site and fully functional, environmental conditions permit safe operations, and that responders have the best possible understanding of the constantly changing location of the spilled oil. NG's oil spill planning documents do not include a realistic or objective assessment of how conditions might limit spill response operations.

Exhibit D80-27-09, p. 14

[166] The report cited was the *Effective Daily Recovery Capacity Project Final Report*, December 7, 2012, by Alan A. Allen, Dean H. Dale, Jerry A. Galt, and John A. Murphy, Genwest System and Spiltec, Edmonds, WA available online at: http://www.bsee.gov/uploadedFiles/BSEE/Research_and_Training/Technology_Assessment_and_Research/tarprojects/600-699/Genwest_EDRC-Project_Final_Report-1.pdf. Mr. Randy Belore, a NG witness, assisted with the oil thickness analysis. See *Ms. Decola, Transcript Vol. 164, lines 12262- 12267.*

1430. A detailed examination of the response gap that exists for NG spill response and the likelihood of encountering environmental conditions which would impair response in the OWA and CCAA is provided at paras. 1356 to 1428, above.

2.4.2.1 Response Capacity

1431. NUKA Research has completed a response capacity analysis for the Project using the Response Options Calculator (ROC) model to calculate the equipment, vessels, and personnel that would be required to contain and recover a 10,000 m^3 oil spill in a generic open water location and a generic channel location in different seasons and with different spilled product.

Exhibit D80-56-3, p. 6

1432. Based on the ROC model outputs for the 16 simulations run, the number of task forces required to contain and recover a 10,000 m^3 spill under idealized conditions within 72 hours is between 8 and 20. The low estimate – 8 task forces – would require 8 oil spill response vessels with 8-16 work boats, 1600 m of ocean boom, and more than 300 personnel to be on-scene and recovering the oil within 8 to 12 hours of the spill (depending upon location). This estimate would presume that sufficient large capacity would be available to support offloading of recovered oil and water from the primary skimming vessel to the barge.

Exhibit D80-56-3, p. 6

1433. Bulk recovery rates across the sixteen 10,000 m^3 spill simulations ranged from 503 m^3 to 2120 m^3 depending on the location, type of oil spilled, and season. In general, more forces are required for an open water spill than for a confined channel area spill, due in part to the longer transit time for resources to arrive on-scene. Likewise, winter spills require additional task forces to achieve the necessary recovery rates because they have shorter operating periods due to reduced daylight. The response capacity estimates for the 16 spill simulations look only at initial on water recovery and do not factor in the additional response resources that would be associated with concurrent response operations, such as nearshore recovery, sensitive area protection, wildlife response, shoreline cleanup and assessment, or spill surveillance.

Exhibit D80-56-3, pp. 6-7

1434. NUKA Research further noted that real world limitations to spill recovery effectiveness would likely reduce the estimated efficiencies derived from the ROC simulations. Factors that could reduce efficiency include slick spreading and thickness, delays in arrival time for response resources, environmental limits to effectiveness, potential for submerged oil, and logistical support constraints. Secondary containment can also be a limiting factor to spill response, because adequate empty tankage is rarely available immediately to support on water recovery. Without adequate storage or recovered oil and water, response operations can quickly grind to a halt and the window of opportunity or oil recovery can be lost.

Exhibit D80-56-3, p. 54

1435. NG's application does not provide any detail about the proposed response structure, capacity and coordination. Without additional detailed information it is not possible to effectively evaluate efficiency, preparedness or capability. The NUKA Research assessment provides valuable information regarding the response capacity that would be necessary to effectively response to spills in both open water locations and confined channel locations. The absence of similar analysis from the NG application materials demonstrates that NG has failed to conduct an adequate assessment of the resources which would be required for effective spill response. Without that information NG is not in a position to provide reliable information about spill response capabilities, associated costs or the effectiveness of response related mitigation measures.

2.4.2.1.1 Inadequate Level of Detail

1436. NUKA Research has assessed application materials filed by NG and concluded that it is extremely difficult to evaluate the oil spill prevention and mitigation measures for the proposed project, because the operational details for the proposed facilities are extremely vague. Oil spill prevention and risk mitigation activities require concrete, targeted actions that attempt to reduce or eliminate specific sources of risk by reducing both the frequency and consequence of oil spills.

> There is simply not enough detail provided by Enbridge to even evaluate the prevention measures, let alone assess whether they are adequate.
>
> *Exhibit D80-27-09, p. 74*

2.4.2.1.2 Conclusion

1437. The NG materials relating to spill response fall short of what should be expected for a project that poses extreme adverse consequences in the event of a large spill. Despite first-hand experience with the propensity of diluted bitumen to sink, NG has ignored this possibility in its assessment of the potential fate and behavior of diluted bitumen in the marine environment. Based on that incomplete assessment, NG has closed the door to effective spill response preparation by limiting its assessment of spill response requirements to floating oils. Environment Canada has confirmed the need for further research before reaching any definitive conclusions about the propensity of diluted bitumen to sink or submerge in the marine environment in the area of the proposed project (see paras. 1249 to 1297 above). By failing to address the possibility of diluted bitumen sinking or submerging in the marine environment, NG has failed to demonstrate a capacity to effectively respond to a spill in those circumstances and claims to be able to mitigate the adverse effects of a marine spill involving sunken or submerged oils should be treated as unsupported and given little weight by the Panel.

1438. By deferring detailed consideration of oil spill contingency planning to a post-JRP process stage of project development, NG has prevented testing of its proposed approaches through the JRP process and has avoided the scrutiny necessary to evaluate whether spill response can be an effective means of mitigating significant adverse effects of a spill into the marine environment. The Panel cannot, therefore, reasonably conclude that spill response can be relied on as mitigation.

1439. Further, the proposed project should not be permitted to proceed as NG has not demonstrated the capacity to effectively respond to oil spills and has shown a complete disregard for the concerns of the Canadian public by failing to ensure that primary project details are available for examination. NG had the opportunity to gain the confidence of the public by submitting its plans and capabilities for transparent public assessment but instead chose to conceal those details from the public and defer them to later processes where public participation will be limited. The failure to present comprehensive and evidence based assessments of spill response capability as part of the JRP process denies the Haisla Nation and the Canadian public the opportunity to have meaningful input into spill response design. The stifling of public participation will ultimately result in a project that is less safe because NG has failed to submit its plans for public scrutiny and will not have the benefit of an informed review process to enhance its spill response planning.

1440. NG is seeking approval for a project which presents unprecedented risk to the Haisla Nation and Haisla Nation Territory. Deferral of detailed spill response planning until post approval prevents testing of NG's proposed response approaches and the capacity of NG to respond to spills, and detracts from public confidence in the JRP Process as an effective means of evaluating the potential effects of the Project.

2.4.2.2 Response Gap Analysis

1441. An assessment of proposed oil spill response systems is crucial to adequately assess the risks posed by the Project.

Exhibit D122-7-13, p. 4

1442. NG has described spill recovery and clean-up as relatively ineffective.

Mr. Michel, Transcript Vol. 162, line 8556

1443. NG has confirmed that during Exxon Valdez oil spill response only 7 to 10 percent of the spilled oil was recovered through skimming and burning, with the majority being recovered through skimming. NG has further confirmed that during the Deepwater Horizon Spill only 8 percent of the spilled oil was recovered through mechanical means.

Dr. Owens, Transcript Vol. 138, lines 8491-8498
Dr. Owens, Transcript Vol. 138, lines 8518-8522

1444. During the best of weather conditions, responding to an oil spill is challenging. **Generally only 10 to 15 percent** of spilled oil is recovered, based on typical estimates for open water recovery efficiencies for mechanical equipment. If response is "impaired," this value may be even less.

Exhibit D122-7-13, p. 25

1445. Transport Canada has confirmed that it is reasonable to expect only a 10 to 15 percent recovery rate of spilled oil in response operations in the CCAA or OWA.

Mr. Kidd (TC), Transcript Vol. 173, lines 25662-25664

1446. Winter storms are the main hazard in the Open Water Area (OWA), which encompasses Hecate Strait, Dixon Entrance and Queen Charlotte Sound. Storm force winds (48-55 knots) and 8 to 10 meter seas are not uncommon in the winter months. Gusts up to 90 knots are known to occur in Queen Charlotte Sound, and Hecate Strait is considered the fourth most dangerous body of water in the world because of the speed at which winds and sea state can change.

Exhibit D122-7-13, p. 7

1447. All response equipment has operational limits. Environmental conditions above or below certain thresholds can impair or preclude effective response regardless of the size or strength of response equipment.

Exhibit D122-7-13, p. 6

1448. Weather and oceanographic conditions are key factors affecting the success of oil spill response. When certain environmental conditions are prevalent, such as high seas and strong winds, conventional oil spill response equipment (e.g. booms and skimmers) ceases to operate effectively. Beyond these conditions, a "response gap" exists because effective oil spill response becomes impaired or impossible. In other words, if an oil spill occurs during these weather and/or sea conditions, oil cannot be properly contained or cleaned up. The response gap is generally represented as the percentage of time when the efficacy of mechanical response equipment is compromised or when the equipment cannot be implemented at all due to logistical challenges.

Exhibit D122-7-13, p. 5

2.4.2.2.1 A Glaring Hole in The Record: NG's Failure to Provide Response Gap Analysis

1449. NG did not file a response gap analysis with the Joint Review Panel and no comprehensive assessment of the expected efficacy of mechanical response was included in the NG application.

Exhibit D122-7-13, p. 4

1450. NG claims that it is not possible to complete a formal gap analysis until equipment is designed and purchased.

Mr. McHugh, Transcript Vol. 134, line 2802

1451. NG has not identified the suite of response equipment available for responding to a marine spill, and does not intend to do so until after project approval. NG has stated that it was not necessary to consider the type of boom, the type of barge or the type of vessel in order to complete initial assessments of response capabilities.

Mr. McHugh, Transcript Vol. 140, lines 14432-14435
Mr. McHugh Transcript Vol. 140, lines 11502-11504

1452. NG professes that it will be able to respond to a marine spill from the proposed project without taking the basic step of examining the availability existing and efficacy of marine response technology and equipment.

2.4.2.2.2 NGs Internal Analysis: Evidentiary Gaps and Credibility Concerns

1453. NG has conducted some form of internal analysis related to response but it has not been filed with the Panel. NG has described the analysis as a "preliminary gap analysis" and confirmed that once specific knowledge of the operating conditions of the equipment is available a formal gap analysis can be completed.

Mr. McHugh, Transcript Vol. 134, lines 2773-2789

1454. In oral questioning, NG suggested that, on the basis of its internal analysis, it will not be able to launch an effective, initial containment operation only 2 percent of the time. NG later clarified its explanation to limit the scope of its stated conclusion to at-source containment.

Mr. McHugh, Transcript Vol. 134, lines 2556-2560
Mr. McHugh, Transcript Vol. 140, line 11300

1455. The internal analysis conducted by NG has not been provided to, and so has not been tested by, the Panel or interveners. NG's assumptions and analytical approach remain a mystery, and there is no objective basis upon which to assess the reliability of NG's internal conclusions. NG could have filed this information but chose not to provide it for testing or examination.

1456. During questioning, NG confirmed that the 2 percent calculation was premised, in part, on assessment of the typical types of equipment that would be used for initial containment and response.

Mr. McHugh, Transcript Vol. 140, line 11290

1457. NG provided general information regarding the analysis that was undertaken to assess and determine the response gap for at-source containment but, despite extensive questioning, was unable or unwilling to provide specific information relating to the operational limitations of the equipment assessed as part of its analysis.

Mr. McHugh, Transcript Vol. 140, line 11290
Mr. McHugh & Dr. Owens, Transcript Vol. 140, lines 11481- 11519

1458. NG was directly asked to provide a quantitative explanation of the 2 percent response gap for at-source containment. No quantitative data was provided to support its assessment in the response.

Mr. McHugh, Transcript Vol. 140, lines 11526- 11547

1459. NG has failed to provide an evidentiary basis upon which to support its assessment of the response gap for at-source containment. NG's assertion of the 2 percent response gap for at-source containment must be given little or no weight.

2.4.2.2.3 NG's Historical Exceedance Examination

1460. In response to questions concerning response gap analysis NG noted that it has filed Exhibit B17-18 *Weather and Oceanographic Conditions at Sites in the CCAA and in Queen*

Charlotte Sound, Hecate Strait and Dixon Entrance. This Technical Data Report provides magnitude, frequency, direction, and exceedance for winds (mean wind speeds), wind wave, swell wave, combined wind wave/swell, visibility and occurrence of fog and sea surface currents.

Mr. McHugh, Transcript Vol. 134, lines 2777-2781
Exhibit B17-18, p. 9

1461. Exhibit B17-18 discusses the weather and oceanographic data in relation to "historical exceedance" but provides no explanation or support for the selection of the historical exceedance standards applied in the document. No information is provided regarding the particular vessels, tactics or equipment that were used as a basis for assessing what constitutes an exceedance. No confirmation has been provided that those vessels, tactics or equipment will be used in for the proposed project. The document makes no mention of responding to sunken or submerged oils.

Exhibit B17-18 (generally)

1462. NG has deferred operational assessment to the future and relied on internal work not filed in the JRP process for many of its representations to the Panel about spill response capabilities. In the opinion of NG "[u]ntil this is a project rather than a proposal, we feel we've taken it far enough."

Mr. McHugh Transcript Vol. 140, lines 11310 to 11312
Mr. McHugh Transcript Vol. 134, line 2798

2.4.2.2.4 Not Far Enough: The Response Gap is Significant

1463. In order to address NG's failure to provide a response gap analysis for consideration by the Panel, two interveners have filed response gap analyses specific to the Project. The Haisla Nation has filed the reports prepared by NUKA Research, and Living Oceans Society has filed Exhibit D122-7-13, the *Preliminary Mechanical Response Gap Analysis for the Enbridge Northern Gateway Project* (LOS Preliminary Mechanical Response Gap Analysis).

Exhibit D80-56-3
Exhibit D122-7-13, p. 4
Ms. Decola, Transcript Vol. 164, line 11966

1464. NG has acknowledged that the *NUKA Oil Spill Response Gap and Response Capacity Analysis* provides a good analysis of the environmental conditions.

Mr. McHugh, Transcript Vol. 134, line 2784

1465. The methodology from the *NUKA Oil Spill Response Gap and Response Capacity Analysis* was developed by NUKA Research and has subsequently been applied by both the National Energy Board and SL Ross, one of the consultants which prepared portions of the NG evidence.

Ms. Decola, Transcript Vol 164, line 11967

1466. Both response gap analysis reports prepared by interveners conclude that there are significant limitations in response capabilities due to the environmental conditions present in the OWA and CCAA.

Exhibit D80-56-3, pp. 6-7
Exhibit D122-7-13, p. 4

NUKA Oil Spill Response Gap and Response Capacity Analysis

1467. The *NUKA Oil Spill Response Gap and Response Capacity Analysis* examined two locations, one within the OWA and one within the CCAA, to serve as representative operating environments for the response gap analysis.

Exhibit D80-56-3, p. 9

1468. Operational limits for four environmental factors (wind, sea state, visibility and temperature) were determined, the operational limits were applied to the weather station datasets, a rule was applied to assess interaction among environmental factors and the response gap rule was applied to the datasets to determine which observational periods had weather that would prohibit response.

Exhibit D80-56-3, p. 13

1469. The study acknowledges certain limitations including:

- As no commercially available response equipment designed specifically for diluted bitumen spills exists, the analysis relied on the application of conventional crude oil technologies;

  Exhibit D80-56-3, p. 16

- Visibility was only assessed in relation to the impact of daylight - fog and other factors impacting visibility were not calculated or assessed; and,

  Exhibit D80-56-3, p. 14

- NG had failed to provide specific information about the quantity or type of equipment that would be used for the proposed project requiring the application of operational limits of standard available technology comparable to the offshore oil spill response equipment maintained by major U.S. oil spill response organizations to address the absence of information relating to the exact quantity or configuration of response equipment and operations;

  Exhibit D80-56-3, p. 15

1470. The operational limits applied in the NUKA Oil Spill Response Gap and Response Capacity Analysis are premised on basic operating limits for mechanical response equipment from a 2007 study completed by NUKA Research in Prince William Sound. The limits were later used by S.L. Ross for a 2011 response gap analysis for the Canadian Beaufort Sea (with minor variations) and were also applied by Living Ocean Society in the LOS Preliminary Mechanical Response Gap Analysis.

Exhibit D80-56-3, p. 19
Exhibit D122-7-13, p. 10

1471. The *NUKA Oil Spill Response Gap and Response Capacity Analysis* concludes that, based on the four environmental factors considered, for Nanakwa Shoals in the CCAA there is a year round calculated response gap of 6.8 % which rises to 13.5 % during the fall and winter.

Exhibit D80-56-3, pp. 21-23

1472. For the Dixon Entrance area located in the OWA the calculated response gap rises to 45.3% year round and 68.5% for the fall and winter.

Exhibit D80-56-3, pp. 26-28

1473. NUKA Research notes that these assessments are based on conservative estimates and the represent "best case" limits and, therefore, the response gap estimates may be low. Conservative estimates were used throughout the analysis, so that the results represent "best case" scenarios. For the response gap analysis, the only environmental factors measured were those for which reliable, hourly data existed to develop the hindcast. It did not incorporate currents; ice; or visibility limitations due to fog, clouds, or precipitation. For the response capacity analysis, logistical factors, mechanical failures, human error, and the impact of on-scene conditions to the overall response are not reflected in the ROC outputs. It is further noted that the conclusions of the report do not establish that an effective response will occur when conditions are amenable, only that the environmental conditions themselves should not prevent it.

Exhibit D80-56-3, pp. 6 and 31

1474. The report notes that "[i]t is clear that there will be times when the proposed Northern Gateway pipeline is operating, necessitating the movement of diluted bitumen and condensate onboard tankers to and from the Kitimat Marine Terminal, when the weather conditions will preclude an effective spill response should a Tanker spill occur."

Exhibit D80-56-3, p. 33

LOS Preliminary Mechanical Response Gap Analysis

1475. The *LOS Preliminary Mechanical Response Gap Analysis* also provides a preliminary response gap analysis by comparing data from the 2007 study completed by NUKA Research and applying it to wave height observations from weather buoys in the proposed marine operating area.

Exhibit D122-7-13, p. 4

1476. The results of the *LOS Preliminary Mechanical Response Gap Analysis* were consistent with the *NUKA Oil Spill Response Gap and Response Capacity Analysis* in that both analyses identified significant gaps in mechanical response. The *LOS Preliminary Mechanical Response Gap Analysis* concluded:

> The preliminary mechanical response gap analysis determined that booms and skimmers are likely to prove ineffective for much of the year in the proposed marine operating area based on wave height alone. This response gap does not include response limitations due to wind, visibility, temperature or currents and thus offers a very conservative response gap estimate. Response is impossible due to wave heights 30.37 percent of the time when averaged across all buoy locations. Response is either impaired or impossible due to wave heights 61.15 percent of the time across all buoy locations. The impairment of, or inability to use mechanical cleanup methods substantially increases the risk posed to marine ecosystems and coastal resources in the event of a spill.
>
> *Exhibit D122-7-13, p. 4*

Conclusion

1477. One of the single greatest risks posed by the proposed project is the possibility of a large scale spill of oil[167] into the marine environment. Large scale oil spills have occurred in many marine locations throughout the world and have had devastating impacts on both humans and the biophysical environment. NG has not demonstrated the capacity or preparedness to respond effectively to a spill and there are significant environmental limitations on effective spill response for the areas at risk. NG has described spill response as a potential mitigating factor in some aspects of its assessment of effects but it has failed to demonstrate the capability to respond in such a manner that spill response and clean up would provide effective mitigation.

1478. Evidence filed by interveners and subject to examination by NG has established significant gaps in response capability due to environmental conditions in the proposed project area.

1479. By seeking to defer such considerations to a post-approval stage of project design, NG has not provided enough information for the Panel to reasonably conclude that NG will be able to mount an effective spill response such that adverse effects to the environment will be insignificant.

1480. Further, one of the key aspects that requires assessment when seeking to determine if the proposed project is in the public interest is whether NG will have the capacity to respond effectively in the event of a spill. NG has not demonstrated an effective capacity to respond to a spill and prevent harm to the Canadian public and the marine environment. Absent credible and transparent evidence of an ability to overcome those significant gaps in response capability the Panel should determine that the proposed project is not in the public interest.

[167] The term oil is being used to refer to diluted bitumen, synthetic crude and condensate.

2.4.3 The Recovery Document is Misleading, Unreliable and Undermines the Credibility of the Northern Gateway Evidence Generally

1481. As part of its reply evidence Northern Gateway has filed Exhibit B83-17 - Reply Evidence, Attachment 8 – Recovery of the Biophysical and Human Environments from Oil Spills (July 2012) (A2V1T1) ("Recovery Document"). The Recovery Document is a literature review of scientific literature, some peer-reviewed, some not, examining studies of past spill events. Literature was reviewed to identify and acquire information on recovery from oil spills and case studies were prepared. The results were then catalogued and interpreted by NG.

Exhibit B83-17, pp. 1-9

1482. The stated purpose of the Recovery Document is to reply to the assertion that ecosystems do not recover from spill events. The document posits six primary conclusions:

- Recovery after oil spills does occur.
- Recovery is common.
- Recovery takes time.
- The time to recovery depends on the environment, Valued Ecosystem Components, and other factors.
- Several factors impede recovery.
- In some cases, recovery needs active human aid.

Exhibit B83-17, pp. 3 and 8-9

1483. The Haisla Nation submits that the Recovery Document has been carefully crafted to provide a false sense of trust and comfort and to detract from the very real and serious impacts of oil spills on the biophysical environment.

1484. This approach is representative of the subtle yet misleading tactics employed by NG to minimize legitimate concerns associated with the proposed project while fostering the fictitious appearance that such concerns are being addressed in a meaningful way.

2.4.3.1 Self-Serving and Contrived Concept of Recovery

1485. NG has acknowledged that a healthy, functioning ecosystem contributes to a healthy society and economy for the Haisla Nation.

Dr. Pearson, Transcript Vol. 142, lines 13913-13915

1486. If a spill were to occur the impacts on the ecosystem and the nature and duration of effects and recovery would have direct bearing on the well-being of the Haisla Nation as a collective and the lives of Haisla Nation members individually. Haisla Nation members have filed extensive affidavit materials and evidence describing their reliance on the biophysical environment, their relationship with their traditional territory and expressing concerns about the potential impacts of a spill.

Exhibit D80-22-04 to D89-22-09 (generally)
Exhibit D80-23-2 (generally)

Exhibit D80-23-3 (generally)
Exhibit D80-23-4
Exhibit D80-34-2 (generally)
Exhibit D80-32-2 (generally)

1487. The issue of what constitutes "recovery" is multifaceted. Environment Canada has confirmed that the definitions of "effect" and "recovery" can significantly influence conclusions.

Dr. Esler (EC), Transcript Vol. 169, line 19979

1488. Environment Canada identified distinctions in direct vs. indirect effects noting that the differentiation between direct and indirect can be an important point. Indirect effects can be observed over a significantly longer time frame.

Dr. Esler (EC), Transcript Vol. 169, lines 19978-19984

1489. Environment Canada also highlighted distinctions between acute and chronic effects (noting that both could be either direct or indirect) and highlighted that distinctions may also be drawn between lethal and sub-lethal effects.

Dr. Esler (EC), Transcript Vol. 169, lines 19985-19986

1490. Environment Canada has also explained that in some instances the environment is so perturbed that the original coalition of species does not return and they are replaced by a different set of species.

Dr. Hollebone (EC), Transcript Vol. 169, lines 20006-20007

1491. The Recovery Document reviews various definitions and factors considered in the literature when defining recovery but it fails to expressly identify a definitive statement of what constitutes recovery in the eyes of the authors or the criteria that would be applied to satisfy that definition. Legal counsel to the National Energy Board directly asked NG what definition or recovery was being applied by NG. NG witnesses responded by describing monitoring programs.

Exhibit B83-17, pp. 23-24
Dr. Pearson Transcript Vol. 137, lines 7209 -7220

1492. The Recovery Document does identify "return to the state that would have been if not for the spill" and "return to a functional ecosystem that provides valuable ecological goods and services" as dominant concepts in the report's definition of the recovery. However, the understanding of the authors of the Recovery Document interaction of these concepts is not articulated and objective criteria are not provided for assessing when these conditions would be met or when one concept would be favoured over the other.

Exhibit B83-17, p. 30

1493. The authors cite Jackson and Hobbs (2009) noting their argument that the goal of recovery and of active restoration of damaged environments should be to recover or

restore the ecosystem to a functional state that provides valuable ecological goods and services.

Exhibit B83-17, p. 24

1494. This concept of recovery advocated by Jackson and Hobbs and endorsed by NG relies on the malleable concepts of "valuable" and "functional" which are easily manipulated to generate results which minimize legitimate concerns associated with spills of oil into the environment. Both "valuable" and "functional" are highly subjective terms and in the absence of objective criteria there is no basis upon which to understand whether the views ascribed to these terms by NG are scientifically sound or whether they are consistent with the understanding of parties which stand to be impacted in the event of a spill.

1495. Further, the use of a functional state analysis as the basis for assessing recovery ignores the important distinctions identified by Environment Canada (discussed above) and prevents the reader from completing a critical assessment of NG's evaluation of when and how recovery occurs. The use of this concept of recovery fails address the actual impacts that may be associated with the adverse effects on the environment from an oil spill in relation to biodiversity, species population or the composition of species which may inhabit a particular place.

1496. Reliance on this concept of recovery in the Recovery Document is self-serving and permits NG to apply a low threshold for assessing recovery. The Haisla Nation submits that NG has purposefully selected a broad and malleable definition of recovery to perpetuate the impression that recovery will occur in a manner that favours the interests of NG by presenting a time limited and minimized version of the impacts of oil spills on the biophysical environment.

2.4.3.2 Timeframes to Recovery

1497. The conclusions of the Recovery Document are unreliable due to the concept of recovery which has been applied. The timeframes to recovery identified are also based on a selective set of data and are inconsistent with the research and knowledge of Environment Canada.

1498. The Recovery Document identified average time to recovered status for the biophysical VECs examined and determined that 2.3 years were required for freshwater environments and 5.8 years for marine environments. Those times were later adjusted downwards by NG during cross examination to 2 years for freshwater VECs and 5 years for marine VECs.

Exhibit B83-17, p. 8
Dr. Pearson, Transcript Vol. 134, lines 1515-1516

1499. Environment Canada has confirmed that there is a growing body of literature indicating that oil spills may affect wildlife for longer timeframes than was previously assumed.

Dr. Esler (EC), Transcript Vol. 168, lines 17644-17645

1500. There were also several instances where Government of Canada written and oral evidence confirmed recovery periods in excess of the conclusions reached in the NG analysis:

- The recovery of Killer Whales "may take decades".

  Dr. Ford (EC), Transcript Vol. 167, lines 17077-17080

- Scientific studies of Sea Otter and Killer Whales in Prince William Sound Alaska indicate that the effects from the Exxon Valdes Oil Spill have persisted for two decades in these two marine mammal species.

  Exhibit E9-21-09, p. 71

- Lance et al. (2001) in their evaluation of marine bird population trends after the Exxon Valdez Oil Spill summarize:

  > …our study indicates that most taxa for which injury was previously demonstrated are not recovering and others continue to show potential population **effects nine years after the oil spill.** We show evidence of slow recovery, lack of recovery, and divergent population trends in many taxa which utilize shoreline and nearshore habitats where oil is likely to persist. These potential lingering spill effects and natural variability appear to be acting in concert in delaying recovery of many PWS bird populations.

  Exhibit E9-6-32, p. 80 (emphasis added)

- In summarizing their study on long-term effects of the Exxon Valdez Oil Spill on Pigeon Guillemots, Golet et al. (2002) indicate:

  > Our study suggests that the recovery of a top-level generalist predator may be constrained by both direct effects (continued exposure to residual oil) and indirect effects (reduced availability of a key prey species) following a large-scale perturbation. Furthermore, it demonstrates that **recovery following oil spills may take considerably longer for certain species than the few years that have been proposed as typical for marine birds.**

  Exhibit E9-6-32, pp. 80-81 (emphasis added)

- Iverson and Esler (2010) developed a model for recovery of Harlequin Ducks from the Exxon Valdez Oil Spill using survey and demographic data. The model estimates a timeline to recovery for Harlequin Ducks of 24 years under the most-likely combination of variables, with a range of 16 to 32 years for the best and worst-case scenarios.

  Exhibit E9-6-32, p. 81

- **19994.** And there are other species like the harlequin ducks that I've worked very much with that showed both direct and indirect effects that occurred

over decades really. So the best estimate of timeline to a full recovery was 24 years. So there's just a lot of variation in terms of recovery times and it really depends on the species that you're considering.

Dr. Esler (EC) Transcript Vol. 169, line 19994

- **20043.** I think your reference was to the status of resources based on the Exxon Valdez Oil Spill Trustee Council. They updated their status of resources I think in 2010. And the three species that were considered not recovering were killer whales, herring and pigeon guillemots. Pigeon guillemots are a small seabird. And I think these guys have covered the whale and herring circumstances pretty well.

Dr. Elser (EC) Transcript Vol. 160, Line 20043

1501. It is also worth noting that the studies examined do not include consideration of recovery, or the absence thereof, relating to VECs impacted by the big spill in Kalamazoo despite the spill having occurred in excess of the average time frame identified by NG for recovery in the freshwater environment.

Mr. Milne, Transcript Vol. 142, lines 14047-14049

1502. In the Recovery Document and in testimony, NG acknowledges that long-lived species such as birds and mammals have longer recovery times than shorter-lived species.

Exhibit B83-17. Pgs. 7, 8, 26, 174 and 177
Dr. Walter Pearson, Transcript Vol. 144, lines 15795-15797[168]

1503. The statistics that were used by NG to derive average recovery times included no data on recovery of mammals[169] and very little on birds[170] (7 VECs, or only 5% of the total number of VECs in the statistics).

B83-17, Appendix B, pp. 231-244

1504. Recovery times calculated in the Recovery Document are shortened due to this gap in the data. Dr. Walter Pearson acknowledged that this was problematic in relation to the lack of data on marine mammals in particular.

Dr. Walter Pearson, Transcript Vol. 133, line 1492

[168] Speaker originally identified as Dr. Maki. See errata Transcript Vol. 145.
[169] Appendix B identifies 174 species originally identified as VECs by NG. Any species that was categorized as having "uncertain" or "insufficient data" under Recovery Status in the table was eliminated from the final list of 140 species that was used to derive the NG statistics for recovery times. There were only 3 mammals identified in the original 174 species listed (see B83-17, UID 7 on page 233 and UID 17 on page 235). All three mammal species are listed as having insufficient data under their Recovery Status, so were not included in the statistics for recovery.
[170] In Appendix B, 11 of 174 initially identified VECs were birds. Four were eliminated due to "insufficient data" (Exhibit B83-17, pp. 233, 235 and 237).

1505. The average timelines presented by NG as conclusive representations of timelines for recovery of VECs from oil spills are much shorter than they would be had a more robust statistical analysis been undertaken. The timelines reported by NG are much shorter than many of the timeframes that have been observed and studied by the Government of Canada and should not be considered a reliable representation of the true nature, duration and extent of the harm caused by oil spills or the recovery times required.

2.4.3.3 Source Data is Not Reliable

1506. A similar study by Jones and Schmitz referenced by NG showed that 40 percent of VECs affected by oil spills have not recovered. The NG study reported 19 percent of VECs affected by oil spills have not recovered. This is a significant difference, but NG claimed that 19 percent and 40 percent were "similar frequencies" showing that recovery does occur.

Recovery Document, B83-17, p. 171
Dr. Pearson, Transcript Vol. 142, lines 13846-13847

1507. NG did not confirm that the studies they assessed applied proper scientific methodology to provide reliable information about the recovery status of valued ecosystem components.

Dr. Pearson, Transcript Vol. 140, lines 11796-11797

1508. NG agrees that many of the studies assessed are consultant's reports and large portion of the studies have not been peer-reviewed. NG also confirmed that where peer review has not been completed there is less assurance that the information provided in the study is reliable and accurate.

Dr. Pearson, Transcript Vol. 140, lines 11820-11825

1509. NG has confirmed that the VECs examined in the studies do not necessarily correspond to the VECs from NG application.

Dr. Pearson, Transcript Vol. 140, lines 11833-11834

1510. Most of the fish species in the Kitimat River (which are migratory species that will pass through the marine environment to reach the Kitimat River) were not considered as part of the Recovery Document.

Exhibit B204-1

1511. The Recovery Document examines very few species from this specific geographic area of the Project.

Dr. Maki, Transcript Vol. 140, line 11912

1512. NG has confirmed that almost all of the research considered in the Recovery Document did not look at biodiversity as an element of recovery.

Dr. Pearson, Transcript Vol. 137, line 7157

Dr. Maki, Transcript Vol. 137, line 7166

1513. NG has also confirmed that the Recovery Document has internal inconsistencies[171] and was prepared in a rushed fashion:

> **14046. DR. WALTER PEARSON:** As I've said before, there were people writing different sections of the report -- this was written by one individual. The other individuals that were developing the -- and doing the analysis of the literature that went into the table in the back were also working independently in -- and there was a fixed deadline and we didn't have a chance to marry all of the particular sections of the report to the table.
>
> *Dr. Pearson, Transcript Vol. 142, lines 14044-14046*

1514. The Recovery Document is an attempt by NG to undermine legitimate concerns associated with the proposed project by minimizing the effects of oil spills and understating the time required for recovery to occur. It promotes a concept of recovery that is malleable, self-serving and inconsistent with the protection of the biophysical environment and the interests of those parties which rely upon the biophysical environment for their sustenance, culture and well-being.

1515. NG has drawn broad stroke conclusions about recovery timeframes and the persistence of effects from oil spills on the biophysical environment based on data that is not peer-reviewed, is not specific to the geographical area of the project, fails to consider biodiversity and does not conform to the VECs in the project area. The Recovery Document was hastily prepared and is based on methodologies and assessments that have not been confirmed to be scientifically reliable. The document is unreliable as a measure of the recovery times that would be required in the event of an oil spill associated with the Project and should be given no weight by the Panel.

2.5 Conclusion re Effects of an Accident of Malfunction

1516. NG has acknowledged that a spill into the marine environment could result in adverse effects, but seeks to rely on the low likelihood of a spill, and mitigation through response and recovery to support a finding that such adverse effects will not be significant.

1517. For the reasons set out above, NG's application does not support a conclusion that the likelihood of a spill is low, or that the effects can be mitigated.

1518. **Finding Requested: The Panel should find that NG has not demonstrated that spill response will be able to mitigate the effects of a spill from at the marine terminal.**

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[171] For example, in Exhibit B83-17 on p. 154 the Recovery Document discusses the big spill in Kalamazoo. It states: "No reports on overall effect and subsequent recovery of bird species or communities." However, in Appendix B of Exhibit B83-17, pg. 239 (where the statistics applied in the Recovery Report were derived from) birds are listed as recovered. Similarly, contradictions are present for reptiles in Kalamazoo. In Exhibit B83-17 on p. 152 it states that "no data are currently available on the success of the recovery of the freshwater turtle fauna." However in Exhibit B83-17 on p. 239 reptiles (turtles) are identified as recovered.

1519. **Finding Requested: The Panel should find that the proposed project is likely to result in significant adverse environmental effects at the marine terminal.**

3. Harvest Studies and FLC are Not Mitigation

1520. NG has proposed to support the establishment of a Fisheries Liaison Committee to mitigate the impacts from marine shipping. The structure and role of the proposed FLC has been examined through information requests and oral questioning. Its usefulness as mitigation of impacts remains in question. It is important to note, however, that the FLC will not be able to mitigate impacts of a spill.

1521. NG has also proposed to conduct harvest studies with potentially affected aboriginal groups so that these groups will be able to establish losses to support compensation claims in the event of a spill.

1522. Harvest studies will not mitigate the biophysical effects of a spill. If they support compensation claims, these studies may mitigate some socioeconomic effects of a spill. The deep cultural effects that the Haisla Nation has identified at paras. 1526 to 1535, below, would not, however, be mitigated by harvest studies.

4. Impacts of the proposed Kitimat Marine Terminal on the Haisla Nation

1523. The Haisla Nation relies on the lands, waters, and resources of Haisla Nation Territory in the exercise of its aboriginal rights. The Haisla Nation asserts aboriginal title to the lands NG proposes to use for the marine terminal for the proposed project. NG's project will result in an infringement of the Haisla Nation's aboriginal title to those lands. The proposed project is fundamentally incompatible with Haisla Nation stewardship obligations and with the use the Haisla Nation could choose for these lands.

4.1 Impacts on Haisla Nation Historical, Archaeological, Paleontological Sites

1524. The proposed terminal will require the destruction of Haisla Nation CMTs and will put at risk Haisla Nation cultural heritage sites. This will result in significant adverse environmental effects under a *CEAA 2012* analysis.

1525. **Finding Requested: The Panel should find that the construction and operations of the proposed Kitimat Terminal will result in significant adverse environmental effects on Haisla Nation cultural heritage and on Haisla Nation historical, archaeological and paleontological sites.**

4.2 Impacts on Haisla Nation Current Use of Land and Resources for Traditional Purposes

1526. Haisla Nation members are engaged in ongoing use of the lands and waters at the proposed Kitimat Terminal. The aboriginal rights exercised in the PDA and PEAA for the terminal and in the areas that could be adversely affected by a spill at the terminal consists of:

- Hunting and trapping of a number of species, including but not limited to: deer, mink, fox, geese, otters, weasels, squirrels, seals, sea otter, sea lions.

- Fishing of a number of species, including but not limited to: eulachon, chum salmon, coho salmon, Chinook salmon, pink salmon, sockeye and spring salmon, halibut, herring (including roe), red snapper, black cod, grey cod, red cod, rockfish, ling cod, octopus, shrimp, prawns, squat lobster, sea urchins (red, green purple).

- Gathering of a number of species, including but not limited to: blueberries, raspberries, red huckleberries, gooseberries, crabapples, rose hips, salmonberries, fern roots, clover roots, buttercup roots, wild rice, hellebore, alder bark, devil's club, fireweed, cattails, cow parsnips, wild rhubarb, large cedar, cedar bark, cedar withes, hemlock cambium, spruce root and spruce gum, clams, cockles, mussels, sea cucumbers, crabs, sea prunes, abalone, chiton, geoduck, octopus, seaweeds, sea grass, kelp, and sea gull eggs.

  Exhibit D80-22-04, pp. 52 and 55
  Exhibits D80-23-2 and D80-23-3, Affidavits of Haisla Nation Members
  Exhibit D80-23-1, Affidavit of Michael Jacobs
  Exhibit D80-32-2, Affidavit of Nina Shaw
  Exhibit D80-34-2, Affidavit of Thomas Gregory Robinson

1527. The construction of the Kitimat Terminal will prohibit the exercise of those aboriginal rights over an area of at least 478 ha of land. In addition, Haisla Nation members will be excluded from a 33 ha of marine habitat, including a 2,220 m stretch of foreshore and marine riparian habitat.

  Exhibit B3-1, pp. 35 and 41
  Mr. Green, Transcript Vol. 114, lines 13540-13544

1528. In addition to the known and anticipated effects set out above, the construction and operation of the proposed Kitimat Terminal is likely to have additional significant effects on Haisla Nation current use of land and resources for traditional purposes in the form of impacts to fish and other aquatic biota and their habitats at the proposed terminal site, in Upper Kitimat Arm and in the Kitimat River Estuary. NG's failure to provide the information required in the Scope of Factors prevents the Panel from reaching a conclusion that the construction and operations of the proposed project will not result in significant adverse environmental effects.

1529. **Finding Requested: The Panel should find that the construction and operations of the proposed Kitimat Terminal will result in significant adverse environmental effects by prohibiting the Haisla Nation's current use of lands and resources for traditional purposes.**

1530. An accident of malfunction from the proposed project that results in a spill of oil is also likely to cause significant adverse environmental effects which will also impact the Haisla Nation's current use of lands and resources for traditional purpose. NG has not demonstrated that there is no likelihood of significant adverse environmental effects from an accident or malfunction.

1531. **Finding Requested: The Panel should find that an accident or malfunction at the proposed Kitimat Terminal will result in significant adverse environmental**

effects on the Haisla Nation`s current use of lands, water and resources for traditional purposes.

4.3 Impacts on Haisla Nation Cultural Heritage

1532. Both the construction and routine operations of the proposed Kitimat Terminal and an accident or malfunction that results in a spill will result in significant adverse effects to Haisla Nation cultural heritage.

1533. Haisla Nation cultural heritage is described in paras. 172 to 185 above. Impacts that prevent Haisla Nation members from exercising their aboriginal rights and aboriginal title result in impacts to Haisla Nation cultural heritage. Imposing a project that is fundamentally at odds with Haisla Nation stewardship obligations is not only an unjustified infringement of Haisla Nation aboriginal title, it also an adverse effect on Haisla Nation cultural heritage.

1534. Further a spill at proposed Kitimat Terminal that prevents the Haisla Nation from accessing its lands, waters and resources in a manner that fosters the continued health of Haisla Nation cultural heritage will result in a significant adverse environmental effect. This is discussed in more detail at paras. 1078 to 1089 above.

1535. **Finding Requested: The Panel should find that the construction and operations of the proposed Kitimat Terminal will result in significant adverse environmental effects by negatively impacting Haisla Nation cultural heritage.**

VI. ENVIRONMENTAL EFFECTS ASSOCIATED WITH MARINE SHIPPING

1. Introduction

1536. The legal context for the assessment of marine shipping is set out at paras. 582 to 628, above. The proposed project requires the use of marine tankers to bring condensate to Kitimat from abroad, and to carry oil from Kitimat to destinations abroad. These tankers will travel to and from the proposed Marine Terminal through Kitimat Arm and Douglas Channel. They will pass through what NG calls the Confined Channel Assessment Area (CCAA) and the Open Water Area (OWA).

1537. The resources harvested by the Haisla Nation in Kitimat Arm are discussed at paras. 159 to 165 and para. 1526, above. Haisla Nation members also harvest resources in Douglas Channel, the CCAA and the OWA. The Haisla Nation relies extensively on marine resources, including the following:

- Fish: eulachon, chum salmon, coho salmon, Chinook salmon, pink salmon, sockeye and spring salmon, halibut, herring (including roe), red snapper, black cod, grey cod, red cod, rockfish, ling cod.
- Invertebrates and shellfish: clams, cockles, mussels, sea cucumbers, crabs, sea prunes, abalone, shrimp, prawns, squat lobster, sea urchins (red, green purple), chiton, geoduck, octopus.
- Mammals: seals, sea otters, sea lions.
- Seaweeds, sea grass, kelp.
- Sea gull eggs

Exhibit D80-23-1, Affidavit of Michael Jacobs
Exhibit D80-32-2, Affidavit of Nina Shaw
Exhibit D80-34-2, Affidavit of Thomas Gregory Robinson

1538. In addition, Haisla Nation members hunt, fish and gather throughout the lands, water, and resources of Haisla Nation Territory, a large tract of which will be at risk of being fouled by an oil spill from a marine tanker if the proposed project proceeds.

Exhibit D80-22-4 (generally)

1539. Haisla Nation members stand to be exposed to potential health impacts from a spill of diluted bitumen, synthetic crude or condensate[172] into the marine environment through direct exposure, through consumption or through lack of access to country foods. In addition, Haisla Nation culture and cultural heritage could be devastated by a large spill of oil from a marine tanker.

[172] Sometimes referred to collectively as oil.

2. Effects of Accidents or Malfunction Associated with Marine Shipping

1540. The Haisla Nation submits that the Panel cannot recommend that the proposed project can proceed, as an accident or malfunction is likely to result in significant adverse environmental effects.

1541. The fact that the effects of a spill will have serious adverse effects is acknowledged by NG and confirmed by federal government witnesses – see paras. 1210 to 1213, above.

2.1 NG's Assessment of the Likelihood of a Marine Tanker Spill is Unreliable

1542. NG's assessment of the likelihood of a marine tanker spill is based on unreliable data and contains significant information gaps, false conservatism, lack of transparency and insufficient consideration of real-world conditions.

1543. Further, serious questions also exist about the federal and provincial governments' roles, responsibilities, knowledge, experience and capacity to monitor, manage, oversee and set guidelines, criteria and regulations that ensure safe practices and effective environmental protection.

1544. Recent budget cuts to federal regulatory agencies, including Transport Canada, Environment Canada, the Canadian Coast Guard and Fisheries and Oceans Canada, will necessarily impact their ability to monitor and enforce compliance with regulations aimed at preventing or mitigating marine oil spill risks.

1545. NG takes the position that the likelihood of a marine spill is low. The Haisla Nation disagrees with this conclusion.

2.1.1 The DNV Report Relies on Data that Underreports Incidents

1546. NG's assessment of risks associated with the marine transportation of oil and condensate in tankers and the risk of incidents occurring during loading and discharge operations at the marine terminal is premised primarily on the Marine Quantitative Risk Assessment prepared by Det Norske Veritas (DNV) and filed as Exhibit B23-34 (DNV Report).

Exhibit B23-34

1547. NG has emphasized that the purpose of the DNV Report is not to specifically identify the probability of a spill; it is meant to assess mitigation measures.

Mr. Michel, Transcript Vol. 156, line 32295

1548. Frequencies for marine transportation incidents in the DNV Report are derived from World-wide statistics catalogued in the Lloyds Register-Fairplay database which is now known as IHS Fairplay (LRF database).

Exhibit B23-34, p. 14

1549. The data assessed from the LRF database was limited to tankers over a certain size. Only data for the years 1990 to 2006 was assessed. NG explained that this approach was taken

in order to limit analysis to vessels that had similar characteristics, with regard to accident probabilities, to those that will be used for the proposed Project.

Mr. Brandsaeter, Transcript Vol. 155, line 31298

1550. NG has acknowledged that the LRF database suffers from significant underreporting of incidents (somewhere between 25-70% of incidents are not reported).

Mr. Brandsaeter, Transcript Vol. 155, lines 31358 to 31364

1551. When first questioned about this in the hearings on March 18, 2013, NG stated that it was aware of the issue of underreporting in the LRF database, and acknowledged that it did not disclose this limitation of the data within the DNV Report.

Mr. Brandsaeter, Transcript Vol. 155, lines 31434-31441

1552. When questioned about underreporting in the LRF database, NG referred to other elements of conservatism in the DNV Report but failed to provide a satisfactory explanation of how that professed conservatism explicitly addressed the issue of underreporting in the DNV Report.

Mr. Michel, Transcript Vol. 156, lines 31639-31648

1553. The use of source data which is compromised by known and significant rates of underreporting should have been acknowledged in the DNV Report and clearly presented to the Panel and the public as a limitation on the confidence of the conclusions of the DNV Report. The non-disclosure of this important aspect of the DNV Report calls into question the reliability of the DNV Report as a whole and raises apprehensions the presentation of the risks of the proposed project.

1554. The use of source data with known underreporting of incidents undermines the accuracy of the DNV Report. To the extent that the source data does not represent actual incident frequencies due to underreporting, the risk levels presented in the DNV Report are understated.

2.1.2 The DNV Report Applies Scaling Factors that are Questionable

1555. The DNV Report applies scaling factors as a method to adjust base frequencies derived from World-wide data to reflect local conditions. NG notes that applying average World-wide data would provide World-wide results but would not add much information that could be useful for the assessment of the proposed project.

Mr. Brandsaeter, Transcript Vol. 156, lines 31723-31724
Exhibit B23-34, p. 21

1556. The scaling factors were calculated based upon the results of a HAZID workshop held in Vancouver, British Columbia with local maritime experts. The hazard identification process used to develop the scaling factors was a subjective rather than quantitative process, and failed to include the views of either commercial fishermen or First Nations groups who operate vessels in the area.

Exhibit B23-34, p.52
Mr. Brandsaeter, Transcript Vol. 156, line 31771
Mr. Carruthers, Transcript Vol. 156, lines 31798-31803 and 31818

1557. Hazards related to potential increases in traffic were not adequately considered. The risk assessment looked at vessel traffic from July and October of 2005, assumed that this traffic would be constant over the 50 year period of operation of the proposed project, and used this traffic level to determine probabilities of collisions. The increase in hazards from any future increase in traffic is ignored, as NG has assumed it will be offset by unknown future improvements to regulations and ship operations.

Exhibit B3-23, p. 27
Mr. Brandsaeter, Transcript Vol. 156, lines 31920 and 31939-31945

2.1.3 The Scaling Factors Do Not Adequately Account For Mitigation

1558. Escort tugs had been in use during the years 1990 to 2006, the time period of the LRF data used by NG.

Mr. Scalzo, Transcript, Vol. 156, lines 32200-32203

1559. The DNV report used data from the LRF database for all incidents that happened within coastal waters where groundings are potential risks without determining whether or not escort tugs had been used. NG was unable to say what number of groundings, if any, from the LRF database included the use of tugs, or whether the use of tugs had been effective in reducing incidents reported to LRF.

Mr. Brandsaeter, Transcript Vol. 158, lines 1818-1819

1560. The DNV Report estimated that use of an escort tug would reduce risk of groundings by 80%, and use of a tethered tug was estimated to reduce risk of drift groundings by 90%. This reduced the total incident frequency by 65%. The use of tug escorts is the cornerstone of the risk reduction measures proposed by NG.

Exhibit B23-34, p. 131

1561. Testimony regarding the mitigation of hazards for collisions with other vessels was inconsistent. NG stated that the use of escort and tethered tugs was effective in reducing potential collisions. However, in other testimony, NG stated that "tugs are very effective in mitigating drift groundings, slightly less effective in power grounding and quite a bit less effective in collisions."

Mr. Brandsaeter, Transcript Vol. 156, line 31858
Mr. Michel, Transcript Vol. 156, lines 32293-32294

1562. NG was not able to identify a single instance in the DNV Report where the assessment of risk had accounted for the availability of particular mitigation measures in the source incident data.

Mr. Brandsaeter, Transcript Vol. 161, line 5943-5946

1563. NG did not fully account for instances where mitigation measures proposed for the proposed project may already have been in use or available to vessels involved in incidents which were included in the LRF database. The inclusion of mitigation measures that are already reflected in the source data results in NG "double dipping" on the effect of mitigation measures on risk probabilities. Where the original source data already reflects reduced spill incident frequencies due to mitigation measures proposed by NG for the proposed project, the risk levels presented in the DNV Report will be understated due to the mitigation measures being double counted.

2.1.4 Changes to the Project Have Not Been Accounted for in the DNV Report

1564. The design specifications for the proposed project have undergone a number of significant revisions since the DNV Report was first drafted. The DNV Report has not been updated to reflect those changes. It is unknown whether these design changes might increase the risk probability of spills.

Mr. Brandsaeter, Vol. 161, lines 5992-6003

2.1.5 NG has Ignored the Risks Associated with the Corrosivity of Dilbit

1565. NG's assessment of risk of oil spills is predicated on the assumption that the products being shipped are equivalent to conventional crude oils, and makes no adjustments for the unique chemical and physical characteristics of oil sands products. This failure to consider the higher corrosive potential of diluted bitumen is an inadequacy of the DNV Report with respect to potential structural fatigue and failures.

1566. Diluted bitumen has a higher sulphur content than other heavy oils. See paras. 856 to 862 above for a discussion of the sulphur content in diluted bitumen products.

Exhibit B50-2, p. 11 (Figure 1a)
Exhibit D80-27-03, p. 2
Exhibit B101-2, p. 33

1567. Sulphate reducing bacteria are known to cause microbial induced corrosion in cargo tanks containing higher levels of sulphur.

Mr. Michel, Transcript Vol. 160, lines 5323- 5324

1568. Best practice to prevent corrosion of cargo tanks would be to coat the tops and bottoms of cargo holds. The IMO will require this of all newly constructed vessels after 2016. It its own evidence, NG stated that:

> It is anticipated that modern oil tankers will experience less actual corrosion due to the enactment of requirements for coating ballast tanks (effective for new ships contracted for construction after 1 July 2008) and the tops and bottoms of cargo tanks (effective for new ships contracted for construction after 1 January 2013).

Exhibit B83-20, pp. 3-4

1569. However, NG would not commit to requiring that all vessels to be used for the proposed project have coated tops and bottoms of cargo tanks as part of its Tanker Acceptance Program.

Mr. Michel, Transcript Vol. 162, lines 7802-7803

1570. NG stated that tankers that do not coat tops and bottoms of cargo tanks are predominantly shipping cargos that, unlike diluted bitumen, are not likely to corrode tanks.

Mr. Michel, Transcript Volume 159, line 3433

1571. Transport Canada has stated that international best practices, including the recent amendment to the IMO regulations for new ships, entail coating the tops and bottoms of cargo tanks to guard against corrosion.

Mr. Dwyer (TC), Transcript Vol. 170, lines 21190 and 21235

1572. Even in cargo tanks that are coated, there is evidence that shows that higher acidity and sulphur content may significantly enhance rates of corrosion.

Exhibits D187-5-1 to D187-5-3, pp. 1-2 (See also Appendices 1-4)
Exhibit D80-027-03, pp. 1-16

1573. There is a body of research that suggests that diluted bitumen may be more corrosive than conventional crude oils. NG's failure to assess the risks of sulphur-related corrosion risk as part of its assessment of risk undermines the reliability of the results and raises concern that the DNV Report is underestimating risk levels.

2.1.6 Inspections and Regulations Do Not Provide the Assurances Needed

1574. NG proposes to rely heavily on tanker inspections to ensure that vessels are meeting the standards they are planning to incorporate into their Tanker Acceptance Program.

1575. Close-up visual inspections are the most effective means for detecting cracks or failures in coatings of cargo and ballast tanks.

Mr. Michel, Transcript Vol. 160, line 5404-5406

1576. Initial port state control or tanker inspection visits by Transport Canada will not ordinarily include either a full cargo tank or ballast tank inspection; they consist primarily of a review of documentation, assessment of any potential complaints by crew members, as well as a tour of different areas of the ship to get a "feel of how the vessel is."

Mr. Roussel (TC), Transcript Vol. 171, lines 23019 & 22910

1577. Physical inspection of cargo and ballast tanks is time-consuming and complex. It requires one to two days for each inspection, including preparation time (2 days if ballast and cargo holds are properly inspected).

Mr. Roussel (TC), Transcript Vol. 171, lines 23071-23072 and 22919-22922

1578. There are no facilities on the West Coast for either dry dock inspections or repairs that might be necessary to investigate or address significant structural issues.

Mr. Roussel (TC), Transcript Volume 171, line 23105

1579. Serious questions remain as to whether the federal government has the capacity, experience and expertise to conduct tanker inspections. The number of port state inspections carried out by Transport Canada has been decreasing. Nationally, Transport Canada conducted 1,082 port state inspections of foreign tankers that arrived at Canadian ports in 2010 and only 540 in 2012.

Exhibit E9-20-13, p. 7
Mr. Turner (TC), Transcript Vol. 171, line 23451

1580. The number of port state inspections of foreign flagged oil tankers conducted in the Pacific Region represents a tiny fraction of those. In 2010 there were 45 inspections conducted; 23 inspections were conducted in 2011; and an unknown number conducted in 2012.

Exhibit E9-21-6, p. 5

1581. With the proposed project's addition of up to 250 tankers calling in Kitimat annually, with an unknown number of them being first arrivals in Canada requiring a Transport Canada port state inspection, and further requiring an annual inspection of each vessel for each year thereafter, this would represent a significant increase in the number of inspections to be conducted by Transport Canada. Inspection of tankers requires experienced inspectors with specialized knowledge and training.

1582. Transport Canada has demonstrated a lack of sufficient procedures and guidance materials with respect to inspections related to the transportation of dangerous goods, including oil and oil sands products in the past. As stated in the Office of the Auditor General of Canada's *Report to the Commissioner of the Environment and Sustainable Development:*

> Procedures and guidance are critical to ensure that sufficient evidence is collected and documented so government can prosecute organizations that do not comply.
>
> *Exhibit D53-3-4, p. 19*
>
> Transport Canada has not ensured that corrective action has been taken on instances of non-compliance. In the sample of completed inspection files we reviewed, 53 percent identified instances of noncompliance and, of those files, 73 percent contained incomplete or no evidence that corrective action had been taken.
>
> *Exhibit D53-3-4, p. 8*

> Supporting documentation is critical to demonstrate that inspectors have properly discharged their duties to verify organizations' compliance with regulations for the transport of dangerous goods. Transport Canada's Inspectors' Manual requires that good documentation be kept. We found that about 70 percent of the files we reviewed did not indicate the scope of the inspection, such as which regulatory requirements were assessed during the inspection. Without clearly laying out the inspection scope, anyone reviewing or following up on the inspection would have no way of knowing the requirements that had been evaluated.
>
> *Exhibit D53-3-4, p. 18*

1583. According to the Auditor General's Report, federal departments have failed to successfully carry out their mandates with respect to the transportation of dangerous products. Given that the proposed project relies heavily on an inspection and enforcement regime to ensure safe operation, these flaws provide little assurance that safety of tankers will be adequately assessed through the inspection process.

1584. Interveners also sought to test the financial and resources capacity of the federal government to provide appropriate services to ensure safe operation of the proposed project through government oversight. However, the federal government took the position that staff and funding cuts were not relevant to the mandate of the Panel.

2.1.7 Challenges that Accompany New Tanker Traffic Not Fully Considered

1585. Increases in tanker traffic and the number of very large tankers create new navigational challenges not encountered before in this region. VLCCs are approximately 320,000 tonne vessels. The largest vessels that have historically navigated the CCAA are 50,000 tonnes.

> *Mr. Al Flotre, Transcript Volume 162, line 8386*

1586. While a limited number of computer simulations have been run, these provide limited reassurance that tankers will not encounter situations that are uniquely challenging to these larger vessels. The differing effects of wind, waves and currents on VLCCs compared to smaller ships in the region have not been adequately considered or assessed by NG.

2.1.8 NG Has Not Considered Impacts of Climate Change

1587. The DNV Report and the Marine Physical Environment TDR fail to account for the probability of increased extreme weather events due to climate change.

> *Exhibits B16-26 to B16-30*

1588. As part of an Environmental Assessment under *CEAA 2012,* NG must consider the impacts of the environment on the proposed project. The *Scope of Factors* specifically explains that this includes long-term climate variability:

The sensitivity of the Project to long-term climate variability and effects will also be identified and discussed.

Exhibit D122-3-13, p. 17

1589. The *CEAA Guidance Document: Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*[173] states that a rationale should be provided as to why or why not climate change impacts were or were not considered within an environmental assessment.

1590. Canada has confirmed that there is a projected increase in extreme ocean wave heights from November to March in the project area due to climate change.

Exhibit E9-21-6, p. 89-90
Dr. Zhang (EC), Transcript Vol. 168, line 17883

1591. Environment Canada evidence has acknowledged that during the past half century or so, the frequency and intensity of strong cyclones over Queen Charlotte Sound, Hecate Strait and Dixon Entrance have slightly increased in autumn (October-December) and spring (April-June).

Exhibit E9-21-6, p. 89-90

1592. There are methods for assessing the risks to a project of climate extremes and changing climatic conditions. An example of this would be the new IPCC assessment called SREX (*Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*[174]) referred to by Environment Canada in testimony.

Dr. Zhang (EC), Transcript Vol. 168, line 17907

1593. NG has filed a *Technical Data Report on the Marine Physical Environment* as Exhibit B16-26 (Marine Physical Environment TDR) which reviews the existing marine physical environment of Douglas Channel, from the Port of Kitimat out to and including Caamaño Sound and Principe Channel. Although not listed in the references for the DNV Report, the Marine Physical Environment TDR is cited throughout the DNV Report.

Exhibit B16-26, p. 9
Exhibit B23-34

1594. There are many characteristics of the marine physical environment that were assessed by NG that may be affected by climate change. Weather events, waves, currents, wind speed and direction all affect the potential for spills and all may potentially be impacted by environmental changes. These factors were all discussed in Marine Physical Environment TDR evidence in relation to the TERMPOL and the location of specific

[173] CEAA Guidance Document: Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners, Prepared by The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment, November 2003, which can be accessed on the CEAA website: http://www.ceaa.gc.ca/default.asp?lang=En&n=A41F45C5-1&offset=&toc=hide
[174] Can be accessed on the IPCC website: http://ipcc-wg2.gov/SREX/

content within the Marine Physical Environment TDR is provided below for ease of reference.

Exhibit B16-26, p. 73, re ocean currents
Exhibit B16-26, p. 26, re sea level
Exhibit B16-27, p. 8, re freshwater discharges and salinity distributions in the CCAA
Exhibit B16-27, p. 81, re ocean pH
Exhibit B83-23, pp. 23-32, re wave heights

1595. None of the materials noted above provide analysis of the potential impact of climate change.

1596. Extreme weather events, currents, sea level, wave heights, and salinity distribution are all factors that impact navigation of vessels and are considered as scaling factors in the marine DNV Report. The failure to address the potential impact of climate change on the marine portion of the project is a failure to conduct a proper environmental assessment, and a failure to adequately assess the likelihood of a spill over the lifetime of the proposed project.

1597. NG has failed to provide relevant and reliable information to the Panel regarding the potential effects of climate change on the risks associated with the project.

2.1.9 Deficient Weather Information Increases the Risks

1598. Weather data from the DNV Report was based on subjective recollections of BC pilots rather than accurate weather statistics.

Mr. Brandsaeter, Transcript Vol. 158, lines 1563-1565 and Transcript Vol. 161, lines 5729-5730

1599. Weather forecast accuracy is an important factor in the safe navigation of vessel traffic. When transiting the open ocean, tanker companies purchase dedicated weather forecasts from weather routing services. Upon entering Canadian waters, marine forecast information is provided by Environment Canada.

Mr. Wood, Transcript Vol. 162, lines 7300-7307
Mr. Fissel, Transcript Vol. 162, lines 7311-7313

1600. Meteorologists use verification statistics to measure the accuracy of forecasts and identify areas where further improvements are needed. Environment Canada does not have verification statistics for Douglas Channel.

Mr. Fissel, Transcript Vol. 162, line 7283
Mr. Doyle (EC), Transcript Vol. 170, line 21885

1601. NG has neither requested nor obtained verification statistics from Environment Canada for the portions of the shipping routes where that data does exist.

Mr. Doyle (EC), Transcript Vol. 170, line 21887

1602. There are no Environment Canada or other visibility stations in the Douglas Channel.

Mr. Doyle (EC), Transcript Vol. 170, line 21961

1603. Severe weather conditions, including hurricane force winds, are known to occur along the proposed tanker routes and may exceed the limits for safe transit of the area.

Mr. Doyle (EC), Transcript Vol. 170, line 21932

1604. Visibilities below a half mile may occur in the Project area and may go undetected by Environment Canada monitoring systems.

Mr. Doyle (EC), Transcript Vol. 170, line 21943

1605. None of the simulations conducted by NG entertained the possibility of visibility below 3-5 nautical miles.

Exhibit B23-18, pp. 29, 34, 35, 36, 37, 39, 41, 49 and 52

1606. The pilot evaluation of the scenario run for arrival at Kitimat with a VLCC in ballast condition noted that the approach will "require good visibility." The simulation was not run in poor visibility conditions.

Exhibit B23-18, p. 43

1607. Because of the severe weather conditions and low visibilities within the proposed project area, Transport Canada has recommended that safe operational limits for weather and sea conditions should be set for all vessels, including both oil tankers and escort tugs. These operational limits have not yet been assessed.

Exhibit E11-3-2, p. 38

1608. The weather information for the region is insufficient to be able to provide forecasts regarding the conditions that vessels are likely to encounter on each transit. It is currently not known what the operational limits will be for vessels. The DNV Report relied on visibility information that does not represent conditions that may be encountered in the proposed project area. The risk of accidents related to weather or shortcomings in weather forecasting have not been adequately assessed by NG.

2.1.10 NG Underestimates the Importance of Emergency Anchorage

1609. NG has stated in written evidence that there are no effective anchorages available for rough weather along the entire route. Holding areas and the Anger Island anchorage are recommended for fair to moderate weather only.

Exhibit B23-18, p. 63

1610. However, in oral questioning, NG contradicted its own evidence and claimed that Anger anchorage could be used in any weather up to and including a "moderately severe storm."

Mr. Flotre, Transcript Vol. 157, line 894

1611. NG also repeatedly suggested that emergency anchorage is not required for transport safety, as tugs can provide the support required should the situation arise where a tanker would need to seek anchorage.

Mr. Cowdell, Transcript Vol. 157, line 890
Mr. Flotre, Transcript Vol. 157, lines 893-896

1612. This oral evidence contradicts evidence filed by the Haisla Nation in the *Analysis and Observations regarding final TERMPOL report on Enbridge Northern Gateway Project* by NUKA Research (Exhibit D80-50-8). The Haisla Nation expert assessment of spill contingency planning and spill response cautions that:

> Escort tugs are not a workable alternative to safe anchorages, as the tugs themselves may suffer casualties, or on-scene conditions may preclude the tug's ability to effectively keep a tanker on station.
>
> *Exhibit D80-50-8, p. 11*
>
> Project approval should be conditional upon more detailed planning for safe anchorages and places of refuge.
>
> *Exhibit D80-50-8, p. 18*

1613. NG downplays the importance of emergency anchorage along the transport routes. However, the environmental conditions in the area demonstrate that unfavourable transport conditions are often present along the tanker routes proposed for the Project. The fact that NG plans to introduce larger transports with more destructive cargo than have ever traversed the waters of the CCAA demands stronger commitments to safety and risk reduction. NG's dismissal of the need for emergency anchorage does not demonstrate this commitment.

2.1.11 Double Hulls Do Not Eliminate Spills

1614. Many accidents and spills can be traced to ships with double hulled cargo tanks. Research and evidence submitted to the Panel indicates that non-accidental structural failures of double hulled oil tankers may increase after 2020.

Exhibit D35-14-5, p. 29
Exhibit D35-21-1, p. 38

1615. NG has committed to having double hulled protection for service fuel tanks. This suggests that all tankers to be used on the proposed project will be built after 2010, when the IMO requirement for double hulled protection of service fuel tanks came into effect.

Ms. DeCola, Transcript Vol. 164, line 11607

1616. It is questionable whether there are enough tankers in the world fleet built after 2010 to meet the all of the specifications of the proposed project. There is currently a surplus of oil tankers on the market, due to the large number of ships built between 2008 and 2011. There are very few new ships being built.

Mr. Michel, Transcript Vol. 156, lines 31666-31669

2.1.12 Conclusion

1617. Although the DNV Report concludes that the likelihood of a spill from marine tankers associated with the proposed project is low, the evidence is not convincing:

- questions remain about how risk was quantified in the DNV Report;
- tanker corrosion has not been adequately addressed;
- NG seeks to rely on government inspection of tankers, and that government inspection has been found as recently as the fall of 2011 to suffer shortcomings;
- potential impacts of climate change on shipping have not been considered at all;
- uncertainties in weather forecasting have not been considered; and
- visibility conditions that are known to exist in the project area have not been considered.

1618. The Haisla Nation does not accept that the spill return periods generated by the DNV Report are accurate and submits that the Panel should carefully assess the reliability of the DNV Report and accord it limited weight in the assessment of the risks associated with the project.

2.2 NG Is Understating Potential Effects of a Spill

1619. The effects of a spill of oil from marine tankers associated with NG's proposed project could have severe adverse effects on the lands, water, and resources of Haisla Nation Territory and pose a health threat to the Haisla people. NG's application seeks to minimize the degree and extent of such effects, by systematically underestimating risks and overestimating ecological resilience.

1620. For the reasons set out at paras. 948 to 992 and 1335 to 1354, above, NG has understated the potential effects of a spill.

1621. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment from tankers is not reliable because it does not consider the full range of products that could be shipped on the proposed project.**

1622. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment from tankers is not reliable because it does not consider all the potential pathways of effect.**

1623. **Finding Requested: The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment from tankers is not reliable because it does not fully consider chronic toxicity.**

2.3 NG is Overstating the Ability to Mitigate Spills Through Spill Response and Recovery

1624. For the reasons set out at paras. 1355 to 1515, above, NG has overstated its ability to mitigate the effects of a spill through spill response.

1625. **Finding Requested: The Panel should find that NG has not demonstrated that spill response will be able to mitigate the effects of a spill from marine shipping.**

1626. **Finding Requested: The Panel should find that the proposed project is likely to result in significant adverse environmental effects at marine shipping.**

3. Impacts of a Marine Spill on the Haisla Nation

1627. Haisla Nation members are engaged in ongoing use of the lands and waters at the proposed Kitimat Terminal. The aboriginal rights exercised in the area that would be impacted by a marine tanker spill includes those exercised at marine terminal area, as discussed in para. 1526, above, as well as in other waters of Haisla Nation Territory. Haisla Nation members engage in the following activities in these areas:

- Fishing of eulachon, chum salmon, coho salmon, Chinook salmon, pink salmon, sockeye and spring salmon, which transit through waters of the OWA, CCCA and proposed Kitimat Terminal.
- Fishing of a number of species, including but not limited to: halibut, herring (including roe), red snapper, black cod, grey cod, red cod, rockfish, and ling cod.
- Gathering of invertebrates and shellfish, including but not limited to: clams, cockles, mussels, sea cucumbers, crabs, sea prunes, abalone, shrimp, prawns, squat lobster, sea urchins (red, green purple), chiton, geoduck, and octopus.
- Hunting of marine mammals, including but not limited to: seals, sea otters, sea lions.
- Gathering of seaweeds, sea grass, kelps.
- Gathering of sea gull eggs

Exhibits D80-23-2 and D80-23-3, Affidavits of Haisla Nation Members
Exhibit D80-23-1, Affidavit of Michael Jacobs
Exhibit D80-32-2, Affidavit of Nina Shaw
Exhibit D80-34-2, Affidavit of Thomas Gregory Robinson

1628. The list of resources above is not exhaustive, as a large extent of Haisla Nation Territory will be at risk of an oil spill from marine tankers if the proposed project proceeds.

1629. An accident of malfunction from the proposed project that results in a spill of oil is also likely to cause significant adverse environmental effects which will also impact the Haisla Nation's current use of lands and resources for traditional purpose. NG has not demonstrated that there is no likelihood of significant adverse environmental effects from an accident or malfunction.

1630. **Finding Requested: The Panel should find that the marine shipping associated with the proposed project is likely to result in significant adverse environmental effects by prohibiting the Haisla Nation's current use of lands and resources for traditional purposes.**

1631. Further, a marine tanker spill will result in significant adverse effects to Haisla Nation cultural heritage. Haisla Nation cultural heritage is described in paras. 172 to 185 above. Impacts that prevent Haisla Nation members from exercising their aboriginal rights and aboriginal title result in impacts to Haisla Nation cultural heritage. Imposing a project that is fundamentally at odds with Haisla Nation stewardship obligations is not only an unjustified infringement of Haisla Nation aboriginal title, it also an adverse effect on Haisla Nation cultural heritage.

1632. A spill from a marine tanker that prevents the Haisla Nation from accessing its lands, waters and resources in a manner that fosters the continued health of Haisla Nation cultural heritage will result in a significant adverse environmental effect. This is discussed in more detail at paras. 1078 to 1089 above.

1633. **Finding Requested: The Panel should find that the marine shipping associated with the proposed project is likely to result in significant adverse environmental effects by negatively impacting Haisla Nation cultural heritage.**

1634. **Finding Requested: The Panel should find that the proposed project is likely to result in significant adverse environmental effects from marine shipping.**

1635. **Finding Requested: The Panel should conclude that these significant adverse environmental effects from marine shipping cannot be justified due to the profound impact they would have on the Haisla Nation, on Haisla Nation Territory, and on Haisla Nation cultural heritage.**

VII. PUBLIC INTEREST AND RECOMMENDATIONS REQUIRED

1. Public Interest

1636. The Haisla Nation submits that the Panel should recommend that the proposed project should not receive certificates under the *NEBA* or a positive decision statement under *CEAA 2012*, as it is not in the public interest.

1.1 Economic Benefits and Burdens

1637. The Haisla Nation submission provides support for a Panel finding that NG has overinflated the benefits associated with the proposed project and has failed to account for the burdens flowing from the proposed project.

1.2 Environmental Effects

1638. The Haisla Nation submission provides support for a Panel recommendation that the proposed project should not receive a positive decision statement under *CEAA 2012*. NG has failed to provide all the information required by the *Scope of Factors*. NG's ESA underestimates risk and overestimates the availability and effectiveness of mitigation. NG has failed to adequately assess risks and toxicity, has not provided enough information about the fate and behaviour of diluted bitumen to allow an assessment of effects from a spill to the marine environrment, and has not demonstrated spill response will act as an effective mitigation measure.

1639. Given the seriousness of the adverse environmental effects associated with a spill from the proposed project and the lack of evidence to demonstrate that a spill could be responded to quickly or effectively, the proposed project cannot be found to be in the public interest.

1.3 Impacts to Haisla Nation Aboriginal Rights and Title

1640. The proposed project will result in significant adverse impacts to Haisla Nation aboriginal rights and title. The proposed project will use Haisla Nation aboriginal title lands for a purpose which is antithetical to Haisla Nation stewardship obligations to its Territory, and in so doing will expropriate the Haisla Nation's opportunity to use those lands for its own purposes in a manner that is consistent with Haisla Nation stewardship of its Territory.

1641. The proposed project will require the destruction of Haisla Nation CMTs and put at risk Haisla Nation rock art, will prevent Haisla Nation members from accessing key areas of their Territory for the exercise of aboriginal rights, and it will pose a risk to the very identity of the Haisla Nation.

1642. The Crown has not commenced to consult with the Haisla Nation in a way that is meaningful about any of these impacts.

1.4 Impacts to Haisla Nation Cultural Heritage

1643. The proposed project threatens Haisla Nation cultural heritage. The Haisla Nation cultural identity is integrally linked to the lands, water, and resources of its Territory.

The Haisla Nation depends on the harvesting and processing of resources from its Territory to ensure its cultural heritage is preserved. A large spill into the Kitimat River or into the marine waters in Kitimat Arm, Douglas Channel or other marine waters in Haisla Nation Territory could be devastating to Haisla Nation cultural heritage. This is not in the public interest.

1.5 Current Status of Regulatory Oversight

1644. There needs to be a clear government structure with adequate expertise and capacity for enforcing regulations for the proposed project and for managing spill response. The structure that is currently in place is insufficient.

1.5.1 Federal Government Ability to Assess Effects Is Limited

1645. The federal government did not conduct an assessment of the potential environmental effects of the project. Fisheries and Oceans Canada stated: "determining or estimating or predicting the effects of the Project is the Proponent's responsibility."

Mr. Engelsjord (DFO), Transcript Vol. 167, line 16766

1646. Fisheries and Oceans Canada, Environment Canada and Transport Canada do not currently have a scientifically reliable understanding of the pathways of effects for spills in the marine environment for products to be shipped by Northern Gateway (see paras. 1253 to 1254, above).

1647. Until the fate and behaviour of products proposed to be shipped has been determined, neither Environment Canada nor Fisheries and Oceans Canada can determine potential environmental effects of the project or assess the adequacy of the information provided by the proponent.

1648. Environment Canada, Fisheries and Oceans Canada and Natural Resources Canada have all noted significant uncertainties and gaps of information in the spill modelling, fate and behaviour, environmental effects and spill response preparedness information filed by NG, requiring further research in order to be able to assess the potential consequences of the project. This research will not be completed in time to inform the Panel's recommendations (see paras. 1249 to 1297, above).

1649. Neither Environment Canada nor Fisheries and Oceans Canada has internal experience or expertise related to aquatic toxicology and environmental effects in the event of an oil spill, and an assessment has not been done by federal government scientists to determine whether the toxicological model used by NG is an appropriate means of assessing effects.

Exhibit E9-21-12, p. 87, Federal Government (EC) Response to Haisla Nation IR No. 1.46g)
Mr. Engelsjord (DFO), Transcript Vol. 108, lines 3992-3993
Dr. Caza (EC) and Mr. King (DFO), Transcript Vol. 168, lines 17706-17715

1650. There is little or no experience in federal government departments with oil pollution effects or oil spill preparedness and response planning:

- The Canadian Coast Guard has no experience with detection, containment, recovery or clean-up of sinking oils.

  Mr. Murdock (CG), Transcript Vol. 169, line 20307

- Environment Canada has never gone through the process of assessing whether or not dispersants are an appropriate response action to an oil spill.

  Mr. Hogg and Mr. Brown (EC),Transcript Vol. 168, lines 17693-17698

- It has not yet been determined which federal department would have approval authority for allowing the use of dispersants in the event of a spill.

  Mr. Hogg (EC), Transcript Vol. 170, lines 22361

1.5.2 Regulatory Agencies Suffer From Limited Budgets

1651. Regulatory agencies have not identified how recent budget cuts or legislative changes will impact their ability to oversee the proposed project in a way that will prevent or mitigate the risks of spills from the proposed project.

1652. While the federal government declined to comment on staff and funding cuts to responsible government agencies, these cuts have occurred.

Ms. Anderson (legal counsel), Transcript Vol. 168, line 18139-18140

1653. Interveners questioned the federal government about its capacity to oversee the proposed project, and in particular sought responses to how funding cuts would affect staffing and work. In response to the proposition that it is public knowledge that DFO staffing in the Pacific Region was cut by nearly one third in 2012, counsel objected to the question, and stated that "I don't think that issues related to the funding of Government and Government internal workings and staffing are of relevance to the Joint Review Panel."

Mr. McCormick (legal counsel), Transcript Vol. 168, lines 18137
Ms. Anderson (legal counsel), Transcript Vol. 168, line 18139

1654. In response to the proposition that it is public knowledge that Environment Canada's budget is being cut by $88 million for 2014-2015, counsel objected that "matters related to the budget of government are, in our view, not relevant to the issues before this panel."

Ms. Fong (legal counsel), Transcript Vol. 168, lines 18321
Ms. Anderson (legal counsel), Transcript Vol. 168, line 18322

1655. The Haisla Nation submits that federal government budgets are directly relevant to the public interest question. The effect of funding cuts on staffing levels and workload is a source of great uncertainty, and raises particular concern given examples of past failures to carry out mandates effectively (see paras. 1582 to 1583, above). It raises legitimate questions about the ability of the federal government to oversee or manage risks inherent in the proposed project.

1656. As was demonstrated in the context of Enbridge's big spill in Kalamazoo, lack of coordinated government oversight can play a critical role in contributing to the likelihood of spills.

Exhibit *D80-69-3, p. 20*

1.5.3 Legislative Amendments Create Uncertainty

1657. There is a lack of any proper jurisdictional structure for federal and provincial departments to address risks inherent in the proposed project.

1658. Federal omnibus Bills C-38 and C-45 were passed in 2012. These bills introduce substantial changes to environmental protection laws in Canada and shift some responsibilities from the federal to the provincial level. At this time, many of the roles of various government departments and the proposed changes to environmental protection laws are ill-defined. This uncertainty in the roles and responsibilities of government departments introduces additional risk from the proposed project.

1659. The combined effect of the legislative changes to the *Fisheries Act* and resulting in *CEAA 2012* and deep cuts to federal departments raises serious concerns regarding whether federal government institutions will have the experience, expertise, capacity or mandates to investigate and enforce potential infractions of Canada's environmental protection laws.

1.6 Public Interest Assessment

1660. In assessing public convenience and necessity, the Panel must consider overall public interest. The NEB confirmed in *Sumas Energy 2, Inc*. that:

> The public interest is inclusive of all Canadians and refers to a balance of economic, environmental, and social interests that changes as society's values and preferences evolve over time. As a regulator, the Board must estimate the overall public good a project may create and its potential negative aspects, weigh its various impacts and made a decision.[175]

1661. In discussing its role, the NEB wrote in *Sumas 2*:

> Inherent in the concept of balancing benefits and burdens is the recognition that something more is required than simply reviewing the evidence to determine if the project would meet the minimum regulatory requirements, standards, objectives or guidelines.[176]

1662. Further, the NEB recognized that regulatory requirements include an implicit recognition that even when there is compliance with the regulatory requirements, standards, and objectives or guidelines, some risks still remain. Such risks, the NEB

[175] National Energy Board Reasons for Decision, *Sumas Energy 2*, Inc. EH-1-2000, March 2004 [*Sumas 2*], p. 109.
[176] *Sumas 2, supra,* p. 110.

concluded, potentially constitute burdens which must be considered in the overall assessment of the benefits and burdens of a project.[177]

1663. Finally, in *Sumas 2*, the NEB noted that a finding of no significant adverse effects under the *Canadian Environmental Assessment Act* does not necessarily indicate an absence of environmental effects which may result in a project being found to not be in the public interest:

> With respect to the Board's consideration of the benefits and burdens of the IPL [Proposed SE2 International Power Line in Canada] under the NEB Act, the Board notes that its conclusion, under the CEA Act, that the IPL would not be likely to cause significant adverse environmental effects, does not imply that there would be no adverse environmental effects associated with the IPL. There still may be some adverse environmental effects that should be considered in identifying, weighing and balancing the overall benefits and burdens of the IPL under the NEB Act. The Board must balance the totality of benefits against the totality of burdens to come to its final determination.[178]

1664. The Panel can, and in the submission of the Haisla Nation must, take into consideration the totality of the burdens associated with the proposed project. These include:

- The environmental burdens flowing from infrastructure development that have not been captured in NG's assessment of project benefits.
- The significant risk the project poses to the environment and to Aboriginal groups, including and specifically the Haisla Nation, who rely on their lands, water and resources for their sustenance and cultural heritage, and who would suffer devastating effects in the event of a large spill.
- The current status of regulatory oversight and governance for various project related matters, including budget constraints and legislative uncertainty.
- The fact that the federal government has to date failed to engage honourably and meaningfully with Aboriginal groups, including and specifically the Haisla Nation, about the potential impacts of the proposed project on aboriginal rights and title.
- The fact that the federal government has unilaterally imposed an impoverished approach to consultation that is not suitable to meaningfully discharge the honour of the Crown in relation to the proposed project.
- The opposition voiced by Canadian Aboriginal groups (including ones that are not participating in the JRP process) and the Canadian public to the proposed project based on concerns that are legitimate and well-founded, as set out in this submission.
- An approval of the proposed project will be divisive and detrimental to the Crown-Aboriginal relationship.

[177] *Sumas 2*, *supra*, p. 110.
[178] Sumas 2, *supra*, p. 110.

1665. **Finding Requested: The Panel should find that in the totality, the impacts and risks associated with proposed project outweigh the potential benefits, so the proposed project is not in the public interest.**

1666. **Finding Requested: The Panel should find that the impacts and risks associated with the project are so disproportionately distributed compared to where the benefits lie, that the proposed project is not in the public interest.**

1667. **Finding Requested: The Panel should find that the potential impacts of the proposed project on the Haisla Nation are of a nature that cannot be justified, so the proposed project is not in the public interest.**

1668. **Finding Requested: The Panel should find that the potential impacts to asserted Haisla Nation aboriginal rights and title from the proposed project are such that the proposed project cannot be found to be in the public interest in the absence of meaningful consultation. The engagement that has occurred to date cannot be considered meaningful consultation and is missing significant components of a meaningful consultation process. The current status of engagement and the federal government imposition of a 6-month time limit to complete consultation raise serious concerns that meaningful consultation will not be possible. Therefore the proposed project is in public interest.**

1669. The Panel's report should capture these findings as well as the ones outlined in the preceding sections of this submission in its report to the Governor-in-Council.

VIII. PROPOSED CONDITIONS

1670. The Panel has proposed a number of potential conditions for the proposed project. The Haisla Nation has included comments on these conditions in other sections of this submission, where warranted, but is also including a separate submission on the potential conditions.

1671. The inclusion of comments and submissions on the proposed potential conditions does not mean that the Haisla Nation condones the issuance of s. 52 certificates for the proposed project or that it accepts NG's proposition that the proposed project will not result in significant adverse effects that cannot be mitigated. The Haisla Nation does neither.

1672. Further, by providing comments on the proposed conditions, the Haisla Nation is not condoning NG's reliance on follow-up or monitoring to determine significance of adverse effects or effectiveness of mitigation. The Haisla Nation is of the view the NG's application is fundamentally defective to the extent that it prevents the Panel from making a positive recommendation.

1673. Finally, the Haisla Nation reserves the right to raise additional concerns relating to the proposed conditions or to raise new potential discussions during any future consultation activities that may occur with federal government decision makers on the proposed project.

1674. This submission will set out whether or not conditions address the Haisla Nation's concerns, comment on the proposed conditions, and identify additional conditions which should be attached to any certificates issued to the proposed project.

1. Adequacy of Proposed Conditions

1675. For the reasons outlined above, the proposed project is likely to result in significant adverse effects and is not in the public interest. The proposed conditions do not have the effect of changing that conclusion, so they cannot be relied on to pave the way for project approval.

1676. The proposed conditions do not address the concerns of the Haisla Nation, as they do not ensure that the proposed project can be constructed and operated in a safe manner, will not cause significant adverse environmental effects, will not threaten Haisla Nation cultural heritage, and will not fundamentally infringe the Haisla Nation's constitutionally protected aboriginal rights and title.

1677. Further, as has been set out in preceding sections of this submission, a number of the proposed conditions are for work that should have been conducted by NG prior to submitting its application and seeking favourable recommendations on the s. 52 *NEBA* certificates and under *CEAA 2012*.

1678. The work outlined in the following conditions should have been completed prior to NG submitting its application. Conditions requiring this work should be conditions precedent to any certificate taking effect, and should be issued under the *NEBA*, for approval.

Panel's Proposed Conditions

1679. **Nos. 13-15 and 16-18 – Pipeline Environmental Effects Monitoring Program and pre-construction surveys:** NG should have engaged in at least 5 years of baseline monitoring of seasonal utilization by species and life stages of potentially affected fish and fish habitat in the Kitimat River Valley prior to submitting its application.

1680. **Nos. 22 and 23 - Marine Environmental Effects Monitoring Program and pre-construction surveys**: NG should have engaged in at least 5 years' worth of baseline monitoring of seasonal utilization by fish and marine bird species and life stages of shoreline and marine habitat in the vicinity of the proposed Kitimat Terminal, in the Upper Kitimat Arm and in the Kitimat River Estuary prior to submitting its application.

1681. **No. 65 - Pre-construction Caribou habitat assessment**: NG should have done this work to support the application.

1682. **Nos. 75-77 - Geohazard Assessment, Mitigation and Monitoring Report:** NG should have provided detailed geohazard assessment and mitigation work to support the application.

1683. **Nos. 85-86 – Provisional Least Risk Periods:** NG should have identified provisional least risk periods to support the application.

1684. **Nos. 127-129, 170-171 and 172 – Preparation of Emergency preparedness and response planning documents and plans**: NG should have prepared these to support the application.

1685. **Nos. 130-131 – Freshwater Fish and Fish Habitat Compensation Plan**: NG should have prepared this to support the application, as outlined in the *Scope of Factors*. This cannot be completed prior to completing proper baseline monitoring in the Kitimat River Valley, as outlined above.

1686. **No. 132 – Marine Habitat Compensation Plan**: NG should have prepared this to support the application, as outlined in the Scope of Factors. This cannot be completed prior to completing proper baseline monitoring at the proposed Kitimat Terminal, in the Upper Kitimat Arm, and at Kitimat River Estuary.

1687. **No. 164 – Enhanced marine spill trajectory and fate modelling:** NG should have prepared this to support the application.

1688. **No. 165 – Research program on behaviour and clean-up of heavy oils**: NG should have conducted this to support the application.

Additional Conditions Precedent

1689. In addition, the following should also be required as conditions precedent to any certificate taking effect:

1690. **Aggregate Seismic Risk Analysis:** NG should be required to submit a seismic risk analysis that aggregates the seismic risk along the whole length of the pipeline. This should be a condition precedent to any certificate taking effect, and should be issued

under the *NEBA*, for approval. The risk analysis must also be provided to the Haisla Nation. Further, the Haisla Nation must be provided with an opportunity to review, question and make submissions on the analysis, and must be provided with funding to do so.

Exhibit B27-14 (generally)
Dr. Malhotra, Transcript Vol. 109 (generally)

1691. **Valve Placement Requirement:** NG should be required to revise its valve placement strategy so that releases under a full bore rupture, with a 13-minute shutdown scenario will be no more than $100m^3$ of oil and $100m^3$ of condensate. This should be a condition for the lifetime of the pipeline and any capacity expansion should be required to comply. This condition should be issued under the *NEBA*, for approval. The valve placement strategy should also be provided to the Haisla Nation. Further, the Haisla Nation must be provided with an opportunity to review, question and make submissions on the valve placement strategy, and must be provided with funding to do so. Putting forward this condition is not an endorsement of the volumes identified in the condition as acceptable: no spill of oil or condensate is acceptable in Haisla Nation Territory.

Mr. Doering, Transcript Vol. 88, lines 8719-8721

1692. **Effects of Climate Change on the Project:** NG has not submitted any evidence about the effects of climate change on the marine shipping component of the project. As outlined in earlier submissions, this is a fundamental flaw in the application. NG should be required to include an assessment of the effects of climate change on the proposed project and on all the risk assessments it has conducted for the proposed project. The risks should be reanalyzed on the basis of climate change, with a report prepared and submitted, under the *NEBA*, for approval. The report should also be provided to the Haisla Nation. Further, the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.

2. Where the Proposed Conditions Should Find a Home

1693. The potential conditions proposed by the Panel are silent with respect to which aspect of the Panel's report they would inform: the s. 52 recommendations under *NEBA* or the *CEAA 2012* recommendation. While any conditions that are finally imposed on the proposed project would attach to any certificate that is issued, differences in the *NEBA* and *CEAA 2012* suggest that the Governor-in-Council could issue conditions in response to mitigation measures and follow up recommended pursuant to *CEAA 2012* that do not fully capture the recommendations.

1694. The National Energy Board has broad jurisdiction to make conditions:

> The National Energy Board's authority allows us to condition, enforce and conduct compliance monitoring for a number of requirements related to environmental protection, which include many recommendations of the Joint

> Review Panel. The National Energy Board is responsible for lifespan regulation of the project.[179]

1695. The Haisla Nation submits that it is the Panel that is charged with reviewing all the evidence and submissions and that the Governor-in-Council should defer to the Panel on conditions, regardless of whether they are presented in the context of the s. 52 *NEBA* recommendations or the *CEAA 2012* recommendation. There must be reasonable assurance that the Panel's recommendations are implemented. The Panel's report should therefore be clear about how its recommendations are informed by and situated within its public interest analysis and the extent to which they are immutable if the public interest is to be met.

1696. The Haisla Nation recognizes that the Governor-in-Council may identify a requirement for additional conditions as a result of consultation. Any such conditions should supplement the conditions and recommendations of the Panel rather than replace them.

3. Comments and Submission on Proposed Conditions

1697. The proposed potential conditions should by no means be made less stringent than what the Panel has proposed. In a number of instances, the conditions need to be strengthened or clarified, to ensure they meet their objectives.

1698. **Definitions**: **Third Party**- this definition requires clarification as to who is responsible for the selection of third parties where independent external review is required. Consideration should be given to involvement of potentially affected Aboriginal groups and stakeholders in the selection of independent reviewers.

Proposed Condition No. 5: Marine Voluntary Commitments

1699. Proposed Condition No. 5 does not go far enough to capture the marine voluntary commitments made by NG in its application and through the hearing process. This condition therefore needs to be expanded to include the additional NG commitments.

1700. This condition should read:

> **Marine Voluntary Commitments**
>
> No ~~laden~~ oil or condensate tanker shall unload or load at Kitimat Terminal until Northern Gateway has implemented or caused to be implemented all of its voluntary commitments related to marine tanker traffic and enhanced oil spill response associated with the Project (Marine Voluntary Commitments). As referenced in the Project application and other evidence, including the TERMPOL Review Committee's TERMPOL Review Process report filed on 23 February 2012, these include, but are not limited to:
>
> a) simulator training <u>to be required throughout the lifetime of the project</u> for <u>completion by all</u> pilots and tug crews <u>prior to assuming their duties on board a vessel</u>;

[179] NEB Reasons for Decision, *Mackenzie Gas Project*, GH-1-2004, Volume 2, December 2010, p. 46.

b) live field trials in the confined channel assessment area for tankers and tug escort operations simulating both laden and ballasted condition with results of the trials reviewed and commented on by a qualified third party and reported to the NEB;

c) a requirement for laden tankers in the confined channel assessment area to have two escort tugs (one tethered);

d) a requirement for ballasted tankers to be accompanied by a close escort tug;

e) purpose-built escort tugs available for ocean rescue;

f) escort tugs equipped with oil pollution emergency response equipment including, but not limited to, containment boom and the means to deploy and distribute sufficient boom to encircle the largest vessel to be used in the Project, oil recovery systems proven to be effective for the recovery of both floating and submerged oil, and enough tankage to store recovered oil until larger floating tankage can be brought to the scene;

g) safe transit speeds for tankers to be identified for all segments of potential tanker routes in Northern Gateway's Port Information Book;

h) a requirement for tankers to modify their speed to reduce the risk of marine mammal strikes;

i) a requirement for tankers to be accompanied by whale-spotting vessels during transit through core humpback whale area (Mr. Green, Transcript Vol. 112, line 9416 and Mr. Carruthers, Transcript Vol. 116, line 16798);

j) the installation of radar to monitor marine traffic and provide additional guidance to pilots and other vessels in the area as well as information to the Canadian Coast Guard's Marine Communications and Traffic Services (MCTS) and, with the approval of the Canadian Coast Guard, become a component of the MCTS Vessel Traffic Services (VTS) system for the region;

k) establishment of vessel operational safety limits that address visibility, wind, and sea conditions;

l) establishment of terminal operational safety limits that address visibility, wind, and sea conditions, including consideration of cargo loading, unloading, ballasting and deballasting sequences;

m) the development of a Tanker Acceptance Program by Northern Gateway that has been audited by a qualified, competent, independent third party auditor and the results have been made publically available, and including, but not limited to, the following conditions:

    i) the non-acceptance of tankers with full width cargo tanks at Kitimat Terminal;

    ii) non-acceptance of tankers greater than or equal to twenty years old;

    iii) non-acceptance of tankers that do not have double-hulled fuel tanks;

    iv) non-acceptance of tankers that do not have double-hulled cargo tanks;

v) non-acceptance of tankers 15 years of age or older that do not have CAP 1 or CAP 2 inspection ratings;

vi) non-acceptance of tankers that do not have coated ballast tanks;

n) the ~~development of~~ Terminal Regulations and ~~a~~ Port Information Handbook to be completed at least 6 months prior to commencing operations and provided to Transport Canada, Fisheries and Oceans Canada, Pacific Pilotage Authority Canada, B.C. Coastal Marine Pilots and the Haisla Nation for their review, comment and approval;

o) ~~the non-acceptance of tankers with full-width cargo tanks at Kitimat Terminal~~ the use of skilled and properly-trained terminal personnel;

p) a requirement for deployment of a boom around tankers during cargo transfer operations;

q) the use of tug crews trained in emergency response; and enhanced oil spill response capabilities including:

i) establishment of a Transport Canada-certified Response Organization with a 36 000 cubic metre response capability capable of being at the site of a spill in the confined channel assessment area within 6 to 12 hours, and at the site of a spill in the open water area within 6 to 12 hours plus travel time;

ii) strategic location of oil spill response equipment and vessels to meet the response time capabilities;

iii) oil spill response capability at the Port of Kitimat that is equal to or greater than that of a designated port;

iv) identification and prioritization of particularly sensitive areas for oil spill response in Geographic Response Plans developed in consultation with the Province of British Columbia and potentially-affected communities in the event of a spill; and

v) development of Community Response Plans.

1701. With regard to the requirement for the establishment of a Transport Canada certified response organization with a 36,000 cubic metre response capacity, the conditions should distinguish between area of primary responsibility and other response areas in the same way the Transport Canada's response organization standards do. In other words, the additional travel time is permitted only for areas beyond the primary area of responsibility, that being the CCAA.

Proposed Condition No. 10: Part IV application

1702. The proposed condition should be expanded to include the following:

- NG should be required to submit its proposed project's capital, operating and financing plan for the proposed project, including each component of the capital structure, prior to applying for tolls approval, and on a go forward basis.

- **10 (b)** NG should be required to submit a Class III Capital Cost Estimate for each of the three scenarios: as an aggregated project, as if only the Oil Export Line is built, and as if only the Condensate Import Line is built. A Class III Capital Cost Estimate is necessary for each scenario to determine the rate base relevant for each possible outcome since the potential investors will decide whether to proceed with the proposed project, or one of the two pipelines independently, irrespective of the Panel's decision on the two certificate requests. As a result, should NG's investors decide to proceed with only one of the pipelines, the Panel needs to know the Class III estimate related to that scenario, and the likely applicable toll rates triggered by the capital Class III estimates.

- NG should be required to submit an equivalent to a Class III Capital Cost Estimate should be undertaken with regards to the operating costs associated with the aggregated project, as if only the Oil Export Line is built, and as if only the Condensate Import Line is built.

- NG should be required to submit revised tolls for approval based on the information identified above.

Proposed Condition No. 22: Marine Environmental Effects Monitoring Program

1703. The Panel should include a condition that the Marine Environmental Effects Monitoring Program include a mitigation table that identifies mitigation measures for potential impacts to fish and fish habitat associated with construction and operations and that clearly links the mitigation to the impact (Exhibit B83-2, p. 11).

1704. If the proposed project is approved, the Haisla Nation would seek to be fully involved in the development of the Marine Environmental Effects Monitoring Program, and would seek to have a significant role in that monitoring. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the development of the Marine Environmental Effects Monitoring Program and be provided with funding for such participation.

1705. In the alternative, this condition should include a requirement that the Marine Environmental Effects Monitoring Program and pre-construction surveys should also be provided to the Haisla Nation. Further, this condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on it, and must be provided with funding to do so.

1706. This condition should include a requirement that Marine Environmental Effects Monitoring Program and pre-construction survey framework must include a description of how the Haisla Nation has been engaged in the development of the framework.

1707. The condition for the Marine Environmental Effects Monitoring Program must include a requirement of a **minimum of five years** of pre-construction marine environmental effects monitoring is required before construction can commence at the marine terminal.

1708. NG has indicated that it actually intends to commence construction of the terminal prior to completing adequate baseline surveys. NG plans to commence construction with less than three years of baseline data. NG has justified this on the basis of the length of time

required to construct the marine terminal and has referred to a time squeeze that will allow for only 2 years and 4 to 6 months of pre-construction monitoring.

Mr. Green, Transcript Vol. 112, lines 9359-9360
Mr. Green, Transcript Vol. 116, lines 16960-16961

1709. Any time squeezes that NG faces in terms of baseline information gathering are time squeezes created by NG. Enbridge and NG have been contemplating this project since at least 2005, and likely much earlier. NG's failure to engage diligently in baseline information gathering does not justify foreshortening this process.

1710. Environment Canada has recommended three years of monitoring prior to construction, three years post-construction, and ongoing monitoring for the MEEMP. Although this recommendation was made in the context of Environment Canada's mandate for migratory birds, it was specifically identified as extending to things beyond marine birds that are relevant to marine birds, such as contaminants and prey (i.e., fish).

Ms. deShield, Transcript Vol. 169, lines 19658-19664

1711. The shoreline and waters at the marine terminal are utilized by number of fish species and life stages, including salmon spp., eulachon and herring. The area may also be used by herring for spawning. The Haisla Nation has filed a *Framework for Aquatic Baseline Monitoring Oil Pipeline Development in the Kitimat River Valley Report*, prepared Dr. Hodson, which details the baseline monitoring which should be conducted prior to disturbance in the Kitimat River Valley.

Exhibit D80-80-64-3

1712. As with a baseline study for the Kitimat River Valley, baseline monitoring at the proposed marine terminal must be long enough to account for variability in prevalence and abundance of species and the range of environmental conditions known to occur. When questioned about monitoring timelines, Dr. Hodson identified fish species in the Kitimat River with 5-7 year lifespans, and stated that the monitoring should be long enough to capture a full life cycle of potentially affected species. NG has identified the salmonid lifecycle as including a period of 1-6 years in the open ocean. Other important fish species that are likely present in the marine terminal also have multi-year life cycles. Most salmon species and eulachon have four-year life cycles, so a minimum of five years of monitoring is required. This is significantly longer than the approximately 2.5 years committed to by NG.

Dr. Hodson, Transcript Vol. 164, line 11365
Exhibit B9-25, p. 32
Mr. Green, Transcript Vol. 116, lines 16960-16961

1713. The Panel has proposed a potential condition requiring the filing of a Marine Environmental Effects Monitoring Program framework and a pre-construction survey framework within one year of approval, as well as pre-construction survey results within 90 days of having completed them, but no later than one year prior to operations. NG has committed to carrying out monitoring prior to construction but seeks to limit this to approximately 2.5 years' worth of data collections.

Exhibit A346 Proposed Potential Condition Nos. 22-24
Mr. Green, Transcript Vol. 113, lines 12511-12515

1714. The proposed condition for the MEEMP should therefore include the requirement that the pre-construction surveys include at a minimum **five** years' worth of pre-construction survey data. Further, potential impacts of the construction and potential impacts at the construction and routine operations on fish and fish habitat must be reassessed after this information has been provided.

Proposed Condition No. 78-79: Tunnel Infrastructure

1715. This condition should be reworded to read:

Tunnel Infrastructure

Northern Gateway must file with the NEB for approval, and provide to the Haisla Nation, at least ~~six~~ twelve months prior to commencing tunnel construction activities:

a) a report on the characterization of the rock mass quality and groundwater conditions expected to be encountered during construction and how they will be addressed during construction;

b) details of mitigation measures for control and treatment of groundwater and protection of surface water during and following construction and for the lifetime of the tunnels;

c) details of mitigation measures for the treatment of sulphide-bearing rock, if encountered;

d) tunnel confined space entry procedures during and following construction;

e) final cross-sectional design drawings;

f) a summary of Northern Gateway's consultation with appropriate federal and provincial authorities, other appropriate stakeholders, and potentially-affected Aboriginal groups regarding the tunnel construction activities. This summary must include any issues or concerns raised by those consulted with regarding the planned activities and how Northern Gateway has addressed or responded to those issues or concerns; ~~and~~

g) details of the construction plans for the tunnels including but not limited to:

i) construction methods to be used;

ii) permanent road access;

iii) tunnel portals and doors;

iv) geohazard mitigation measures at tunnel entrances;

v) tunnel lining system;

vi) ground support system;

vii) ventilation and lighting;

viii) location, size, and design of waste rock disposal areas;

ix) plans for disposal of any waste rock that cannot be stored in waste rock disposal areas on site, identification of suitable alternative disposal sites in the region, confirmation that the Project will be permitted to dispose of waste rock at the remote sites if required, and costs of transportation and disposal at remote sites on a per tonne basis; and

x) location, size, and design of staging areas.

1716. Further, to address the concern that potentially acid generating rock will be excavated from the tunnel areas, and that it could affect both surface and ground water quality with consequential effects on fish and fish habitat if it is allowed to be exposed to the atmosphere, the Acid Rock Drainage Plan should be in place at least one year prior to commencement of construction and monitoring must continue for the lifetime of the project. The Plan should exceed British Columbia guidelines on metal leaching and acid rock drainage at mine sites, as committed to in NG's application.

1717. The waste rock disposal areas during construction must have underwater storage capacity. If underwater storage on-site is not feasible, the waste rock must be transported to a storage site that meets or exceeds the above-noted standards.

Exhibit B1-5, p. 31,
Mr. MacKay and Mr. Cavers, Transcript Vol. 91, lines 12559-12581

1718. Finally, this condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.

Proposed Condition No. 147: Financial assurances – operations phase

1719. These financial assurances are considered to be a minimum, and in relation to the entire package of proposed conditions. If any of the proposed conditions that are intended to mitigate risk associated with the proposed project's safety and design are relaxed, the financial assurances in Condition 147 will need to be increased.

1720. The report from an independent third-party assessing the financial assurances plan and key components should be required to be filed every year, not every fifth year.

1721. If a separate legal structure is required for the Northern Gateway Condensate Pipeline, the terms and conditions respecting adequate financial resources, as provided in Condition 147, should be separately and additionally applied for the Condensate Pipeline.

1722. Cost associated with these financial assurances should be included in the development of NG's operating budgets to ensure these costs are clearly reflected in the toll rates developed for the oil pipeline as a stand-alone project, and the condensate pipeline as a stand-alone project.

1723. The designed capacity of the proposed project is greater than the capacity applied for and under review by the Panel. If the proposed project is approved, a potential condition should be added that, if the NG applies to expand the capacity of the proposed project, it

will be required to obtain a commensurate amount of insurance appropriately reflecting the underlying increased risk of the enhanced throughput capacity, structured along the framework outlined for Potential Condition 10 (b).

Proposed Condition No. 164: Enhanced marine spill trajectory and fate modelling

1724. The conditions as proposed fails to capture both oil and condensate and does not identify all the interactions and issues associated with the products to be transported on the proposed project.

1725. The condition should be reworded as follows:

Northern Gateway must file with the NEB for approval, and serve a copy on all potentially-affected Aboriginal groups, **at least three years prior to commencing operations**, a plan to prepare enhanced marine spill trajectory and fate modeling for Kitimat Terminal and marine tanker traffic. The plan must include, but not be limited to:

a) a summary of Northern Gateway's consultation with Environment Canada and all potentially-affected Aboriginal groups regarding the scope of work to be undertaken. This summary must include any issues or concerns raised by Environment Canada regarding the scope of work and how Northern Gateway has addressed or responded to those issues or concerns;
b) the membership of a Scientific Advisory Committee and its Terms of Reference;
c) a schedule for completing the work and confirmation that it will be completed prior to commencing operations;
d) the scenarios to be modeled, which, at minimum, must include the same six scenarios in terms of locations and potential spill volumes included in Northern Gateway's modeling work referenced in Exhibit B3-22 (Volume 7C of the Project application, Section 9 - Examples for Response Planning), and Exhibit B3-42 (Volume 8C, Section 10 - Mass Balance Examples for Response Planning); and
e) a detailed discussion of how Northern Gateway will include in its enhanced modeling the following:
    i) stochastic calculations and visual representations;
    ii) how the model will be adapted to different physical characteristics of the ~~oil~~ products that ~~is~~ are intended to be shipped to and from Kitimat Terminal with particular reference to water uptake, density, adhesion properties, and evaporation rates;
    iii) sediment interaction in coastal and river environments and resuspension or remobilization of oil from the shorelines due to tidal or other influences such as varying adhesion properties of the oil intended to be shipped from Kitimat Terminal, and oil retention times;
    iv) resurfacing of submerged or entrained oil;
    v) toxicity and bioavailability;
    vi) potential for oil to sink based on temperature, weathering and adhesion to sediment;
    vii) how weathering and trajectory models will be integrated to provide

an accurate representation of the potential fate of oil within the environment;

viii) how the models will be used at any time of the year and under varying meteorological and hydrological conditions; and

ix) how the models will be used to inform decision-making during spill response exercises and actual spill events.

1726. Finally, this condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.

Proposed Condition No. 165: Research program on behaviour and clean-up of heavy oils

1727. Sequentially, this work will likely have to precede the work outlined in proposed condition No. 164.

1728. 165(a)(ii) should only refer to funding that is demonstrated as existing.

1729. Further, this work should include toxicity to marine and freshwater species and oil residue recovery in 165(d) as topics to be addressed through research:

> 165(d): topics to be addressed through the research including varying physical and chemical properties of the oil intended to be shipped from Kitimat Terminal, product weathering, dispersion and oil/sediment interactions, product submergence, toxicity to marine and freshwater species, product behavior and residue recovery following in situ burning, and clean-up and remediation options for sediments and shoreline;

1730. 165(g) should include a discussion of the purchase of specialized equipment:

> 165(g): how Northern Gateway will incorporate the results of the research into its emergency preparedness and response plans, including the purchase of specialized equipment; and

1731. Finally, this condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the research program, and must be provided with funding to do so.

1732. In addition to the comments set out above, the Haisla Nation has captured its shorter comments on other proposed conditions in the table below:

Condition No.	Haisla Nation Comment
1	**Compliance with conditions** 1. This condition should include a requirement for NG to advise the Haisla Nation of any request to the National Energy Board of any application to vary any of these conditions.
12	**Commitments Tracking Table** 1. This commitment should include some way of tracking and verifying that NG has implemented and is complying with the commitments contained within the commitments tracking table.

13 – 15	**Pipeline Environmental Effects Monitoring Program** 1. If the proposed project is approved, the Haisla Nation would seek to be fully involved in the development of the Pipeline Environmental Effects Monitoring Program, and would seek to have a significant role in that monitoring. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the development of the Marine Environmental Effects Monitoring Program and be provided with funding for such participation; in the alternative, 2. NG should provide to the Haisla Nation that portion of its Pipeline Environmental Effects Monitoring Program which is relevant to Haisla Nation Territory. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the program, and must be provided with funding to do so. 4. The Pipeline Environmental Effects Monitoring Program should include a description of how the Haisla Nation has been engaged in the development of the framework.
16 – 18	**Pipeline Environmental Effects Monitoring Program: Pre-Construction Survey Framework** 1. This condition must specify the degree and extent of baseline information that should be collected in the Kitimat River Valley, and should ensure the pre-construction information gathering time period is adequate to gain an understanding of pre-construction conditions. Dr. Hodson has suggested at least 5-7 years (Dr. Hodson, Transcript Vol. 164, line 11365). 2. The Pipeline Environmental Effects Monitoring Program should include a mitigation table that identifies mitigation measures for potential impacts to fish and fish habitat associated with construction and operations and that clearly links the mitigation to the impact (Exhibit B83-2, p. 11). 3. If the proposed project is approved, the Haisla Nation would seek to be fully involved in the development of the Pipeline Environmental Effects Monitoring Program: pre-construction survey framework, and would seek to have a significant role in that surveying. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the surveying and be provided with funding for such participation; in the alternative, 4. NG should provide to the Haisla Nation that portion of its Pipeline Environmental Effects Monitoring Program: pre-construction survey framework which is relevant to Haisla Nation Territory. 5. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the framework, and must be provided with funding to do so. 6. The Pipeline Environmental Effects Monitoring Program: pre-construction survey framework should include a description of how the Haisla Nation has been engaged in the development of the framework.
19 – 21	**Pipeline Environmental Effects Monitoring Program: Pre-Construction Survey Results and Monitoring Plans** 1. NG should provide the Pipeline Environmental Effects Monitoring Program: Pre-Construction Survey Results and Monitoring Plans to the Haisla Nation at the same time as it provides them to the NEB.

	2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the program, and must be provided with funding to do so.
23	**Marine Environmental Effects Monitoring Program: Pre-Construction Survey Framework** 1. If the proposed project is approved, the Haisla Nation would seek to be fully involved in the development of the Marine Environmental Effects Monitoring Program: survey framework, and would seek to have a significant role in that monitoring. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the surveying and be provided with funding for such participation; in the alternative, 2. The survey framework associated with the Marine Environmental Effects Monitoring Program: survey framework should also be provided to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the framework, and must be provided with funding to do so. 4. The framework should include a description of how the Haisla Nation has been engaged in the development of the framework.
24	**Marine Environmental Effects Monitoring Program: Pre-Construction Survey Results and Monitoring Plans** 1. NG should provide the Marine Environmental Effects Monitoring Program: Pre-Construction Survey Results and Monitoring Plans to the Haisla Nation at the same time as it provides them to the NEB.
38	**Fisheries Liaison Committee (FLC) Meeting Summaries** 1. NG should provide the report summarizing the meetings of the FLC to the Haisla Nation and to members and attendees. 2. NG should provide the update to this report to the Haisla Nation and attendees. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
39	**Aboriginal, Local, and Regional Skills and Business Capacity Inventory** 1. This commitment should be reworded to require NG to provide this information much earlier, to ensure reasonable opportunities for aboriginal groups to participate in project opportunities.
43 – 46	**TLU Investigation Plan** 1. NG should provide the updated TLU Investigation Plan to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
47	**Development of Marine Mammal Protection Plans** 1. NG should provide the updated Development of Marine Mammal Protection Plans to the Haisla Nation.
48 – 51	**Environmental Protection Management Plan (EPMP)** 1. NG should provide the updated EPMP (Environmental Protection Management Plan) to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an

	opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
52	**FLC Operational Guidelines** 1. The FLC operational guidelines should be provided at an earlier date than is suggested in the proposed condition, to reflect the fact that terrestrial construction may also have impacts which require FLC input. The FLC operational guidelines should be filed at least two years prior to commencement of construction.
53	**Socio-Economic Effects Monitoring Plan** 1. NG should provide its plan for monitoring potential adverse socio-economic effects of the project during construction to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
54 – 57	**Pre-Construction TLU Investigation Report** 1. NG should be required to provide the pre-construction TLU investigation report and updates to aboriginal groups as well. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
59 – 62	**Wetlands Functional Assessment Plan** 1. If the proposed project is approved, the Haisla Nation would seek to be fully involved in the development of the wetland functional assessment plan and the follow up steps required as a result of that assessment; in the alternative, 2. NG should also provide the wetland functional assessment plan to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
63 – 64	**Access Management Plan** 1. NG should also provide the access management plan to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
71 – 73	**Linear Feature Management and Removal Plans** 1. The Linear Feature Management and Removal Plan should, in the identification of areas where linear feature management and removal measures will be implemented, demonstrate that the feature removal will result in no net gain of linear features in Haisla Nation Territory.
74	**Construction Marine Mammal Protection Plan** 1. NG should also provide its Construction Marine Mammal Protection Plan to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
75 – 77	**Geohazard Assessment, Mitigation, and Monitoring Report** 1. A representative of the Haisla Nation should be included in the independent geo-hazards working group.

	2. The Report should include additional detail regarding the Clore and Holt Tunnels and should, at a minimum, include verification of bedrock stability in the Clore and Holt Tunnel construction areas. 3. The Report should include a copy of the report(s) by the independent geohazard working group (or committee) comprised of specialists from various organizations, including, but not limited to, governments, local experts, and consultants for NG. 4. NG should also provide its final Geohazard Assessment, Mitigation, and Monitoring Report to the Haisla Nation. 5. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
82	**Air Quality Emissions Management and Soil Monitoring Plan** 1. NG should also provide the Air Quality Emissions Management and Soil Monitoring Plan for the Kitimat Terminal to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
83 – 84	**Watercourse Crossing Design** 1. NG should provide its Watercourse Crossing Design to the Haisla Nation. 2. The Haisla Nation must be included in the entities with whom NG ought to consult regarding the design of watercourse crossings.
85 – 86	**Provisional Least Risk Periods** 1. Those portions of the summary of NG's consultation with DFO and BCMOE regarding least-risk periods and additional mitigation that deals with watercourses in the Kitimat River and Douglas Channel drainages should be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
87	**List of Infrastructure Sites** 1. The construction of infrastructure sites should include but not be limited to the construction of access to the infrastructure.
88	**Construction Schedule** 1. The detailed Construction Schedule should show all planned construction timing and all timing constraints due to fish, wildlife, vegetation, or traditional use consideration.
91 – 93	**Technology and Site-Specific Mitigation Related to Emergency Preparedness & Response** 1. Where NG is providing a rationale for not using emergency preparedness and response technology and site-specific mitigation discussed in the application and the hearings, NG must include an analysis of the extent to which its decision to not use such technology is inconsistent with commitments made in the application and the hearing record. 2. The footnote describing examples of technology and site-specific mitigation should include road culvert containment systems in the Kitimat River Valley and equipment caches in remote locations.
94 – 97	**Protection and Management Plan for Post-AD 1846 Culturally-Modified Trees**

	(CMTs) 1. NG should provide its protection and management plan for post-AD1846 culturally-modified trees in Haisla Nation Territory to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
98 – 100	**Acid Rock Drainage Monitoring and Follow-Up Program** 1. NG should provide the Acid Rock Drainage Follow-Up Program and results to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
101 – 104	**Surveys and Mitigation for Rare Plants and Rare Ecological Communities** 1. This commitment should be extended to include old growth management areas and culturally important plant species. 2. The results of the surveys should be provided to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
112 – 113	**Complementary Leak Detection Systems** 1. The report should include demonstration of the effectiveness of complimentary leak detection.
114 – 117	**Heritage Resources Regulated Under the *Heritage Conservation Act*** 1. All permits obtained for Haisla Nation Territory as required for archeological and heritage resource permits and clearances should be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
118	**Landowner Consultation** 1. Records of consultation with the Haisla Nation as a land owner should also be provided to the Haisla Nation.
126	**Implementation and Monitoring of, and compliance With, Marine Voluntary Commitments and the TERMPOL Review Committee** 1. NG's plan for implementation, monitoring, and compliance with its marine voluntary commitments and TERMPOL recommendations should also be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
127-129	**Preparation of Emergency Preparedness and Response Planning Documents** 1. The plan for preparing oil spill response plans should be provided much earlier than 30 days prior to commencing construction. 2. A copy of the plan should also be provided to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so. 4. The approximate timing for completion of plan development should

	demonstrate that it can be completed and fully field exercised prior to the commencement of operations. 5. There should be an additional condition that prohibits the commencement of operations until such plans are completed and fully field exercised at least twice.
130 – 131	**Freshwater Fish and Fish Habitat Compensation Plan** 1. The Haisla Nation should be involved in any freshwater fish and fish habitat compensation plan development in Haisla Nation Territory. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the plan development and be provided with funding for such participation; in the alternative, 2. The Freshwater Fish and Fish Habitat Compensation Plan for the pipeline right-of-way should also be provided to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
132	**Marine Habitat Compensation Plan** 1. The Haisla Nation should be involved in any marine habitat compensation plan development in Haisla Nation Territory. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the plan development and be provided with funding for such participation; in the alternative, 2. The Marine Habitat Compensation Plan should also be provided to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
133	**Post-Construction Environmental Monitoring Methods** 1. If the proposed project is approved, the Haisla Nation would seek to be fully involved in the development of the post-construction environmental monitoring methods, and would seek to have a significant role in that monitoring. The Panel should include in this condition a requirement that the Haisla Nation be a participant in the monitoring methods development and be provided with funding for such participation; in the alternative, 2. The post construction environmental monitoring methods must also be provided to the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
134	**Secondary Containment at Kitimat Terminal** 1. NG should identify whether the increased containment required will increase the blasting and excavation at the terminal site and how this has been accounted for in the ESA. 2. The increase from 110% of one tank volume to 600% of the volume of the largest tank is a good first step, but does still not create a large enough containment. 3. The requirement to provide accommodation for peak precipitation and have allowance for potential future tanks in water generated from potential

	firefighting activities must be stated to be an addition to the volume required to accommodate six times the volume of the largest tank in the tank farm.
135	**Construction Progress Reports** 1. NG should provide the construction progress report to the Haisla Nation for that portion of the work which is taking place in Haisla Nation Territory. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
141	**FLC – Annual Report** 1. NG should provide the Annual Report for the FLC to the Haisla Nation and to the members of the FLC. 2. The Annual report should also include a summary of concerns identified by FLC members, a summary of input from fishers, a summary of mitigation measures proposed and/or implemented, and confirmation that the annual report has been provided or made available to all meeting attendees, other government agencies involved in the FLC, and any groups or parties involved in any issues brought forward for dispute resolution. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and must be provided with funding to do so.
142 – 143	**Watercourse Crossing Contingency Plans** 1. NG should provide confirmation of successful completion of watercourse crossings in Haisla Nation Territory, as well as changes to proposed trenchless watercourse crossings in Haisla Nation Territory to the Haisla Nation for those watercourse crossings in the Kitimat River and Douglas Channel drainages. 2. The notification of changes to watercourse crossings should set out whether any additional HADDs are anticipated.
144 – 145	**Construction Outside of Least Risk Periods** 1. NG should notify the Haisla Nation of proposed trenchless crossings outside least-risk period for watercourse crossings in the Kitimat River or Douglas Channel drainage. 2. NG should provide to the Haisla Nation the information for trenched crossings proposed outside least-risk period for watercourse crossings in the Kitimat River and Douglas Channel drainages.
146	**Reporting on the Construction Marine Mammal Protection Plan** 1. NG should provide the report on the Construction Marine Mammal Protection Plan to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
151-152	**Column Separation** 1. Failure to comply with this condition should result in the revocation of the Certificate.
153 – 155	**Field Changes Manual for Geohazard Mitigation** 1. The Field Changes Manual for Geohazard Mitigation should be provided to the Haisla Nation as well. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the manual, and

	must be provided with funding to do so.
166	**Annual Research Program Progress Reports** 1. The progress report for the Scientific Advisory Committee research should be made publicly available and should be subject to peer review.
167	**Consultation on Emergency Preparedness and Response with Interested Parties** 1. The consultation that is required should be a robust process involving stake-holder participation, review and comment on plans and other documents. 2. The plan for consulting on emergency preparedness and response for the pipeline and the Kitimat Terminal should also be provided to the public and the Haisla Nation. 3. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
168	**Emergency Preparedness and Response Exercise and Training Program** 1. The Emergency Preparedness and Response Exercise and Training Program should be designed to address worst-case scenarios. Conditions 168(d)(i)–(iii) should therefore be reworded to include a consideration that a full bore rupture will not be shut down in 13 minutes but will take longer to detect. Further 168(d)(iii) should therefore should be reworded to refer to peak flow conditions (which may not occur in the spring). Finally, 168(d)(iv) and (v) should require consideration of a much larger spill volume, such as 1500m^3. 2. 168(e) should include a minimum number of table-top and full-scale exercises to be completed prior to the commencement of operations and annually during the life of the project. 3. 168(f) should include reporting on the exercises, learnings, a listed of needed improvements and a timetable for implementing improvements.
170 – 171	**Emergency Preparedness and Response Plans with Transport Canada, the Canadian Coastguard, and Environment Canada** 1. The confirmation of third-party review should be provided by the third-party and not NG. 2. The response times for equipment and personnel to the right-of-way and to high consequence areas should be verified by field exercises under varying daylight and weather conditions.
172	**Emergency Preparedness and Response Plan for Kitimat Terminal** 1. The Third-Party Confirmation Report should be provided by the third-party and not by NG.
173	**Operations Marine Mammal Protection Plan** 1. The Operations Marine Mammal Protection Plan should also be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
176	**Availability of Enhanced Marine Spill Trajectory and Fate Models for Spill Responders** 1. The letter regarding enhanced marine spill trajectory and fate models should be provided to all parties who stand to be impacted by spills.
177 – 178	**SCADA and Leak Detection System Design** 1. A description of the automatic shut-down procedure that can be implemented

	should be added.
181	**Ongoing Implementation of Marine Voluntary Commitments and Recommendations of the TERMPOL Review Committee** 1. The report documenting continued implementation of the Marine Voluntary Commitment and TERMPOL recommendations should also be provided by the Haisla Nation.
182	**Submission of Final Research Program Report** 1. The research on behaviour and clean-up of heavy oils report should be finished prior to the operations. This condition should be moved into the pre-operations phase. The research results should be made available to the public once they are completed.
185	**Post-Construction Environmental Reports (Terrestrial)** 1. The Preconstruction and Environmental Monitoring Reports (terrestrial) should also be provided to the Haisla Nation for those portions relevant to Haisla Nation Territory.
186	**Reporting on the Operations Marine Mammal Protection Plan** 1. The report on Operations Marine Mammal Protection Plan should also be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the plan, and must be provided with funding to do so.
187 – 188	**Quality Program for the Complementary Leak Detection Systems** 1. The report on observed detectability, etc. should also include a reference to learnings from other systems where similar technology is in use.
189 – 190	**Quality Program for the SCADA and Leak Detection Systems** 1. The SCADA Technology Report should also include a reference to learnings from other systems.
191	**Pipeline Environmental Effects Monitoring Program: Monitoring Results** 1. The Pipeline Environmental Effects Monitoring Progress Report should also be provided to the Haisla Nation for those portions relevant to Haisla Nation Territory. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the results, and must be provided with funding to do so.
192	**Marine Environmental Effects Monitoring Program: Monitoring Results** 1. The Marine Environmental Effect Monitoring Results should also be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the results, and must be provided with funding to do so.
193 – 194	**Pipeline Inspections** 1. This condition should include enhanced pipeline integrity monitoring for the lifetime of the project.
196	**Project Completion** 1. The Project Completion and Construction Compliance Report should also be provided to the Haisla Nation. 2. This condition should provide that the Haisla Nation must be provided with an opportunity to review, question and make submissions on the report, and

	must be provided with funding to do so.

4. Additional Conditions Are Required

1733. As set out above, the Haisla Nation does not believe that certificate conditions can address the fundamental flaws in NG's application, ensure the project will not cause significant adverse environmental effects, or result in a project that will not fundamentally infringe Haisla Nation aboriginal rights and title. By proposing these additional conditions, the Haisla Nation is not agreeing that these additional conditions can overcome the flaws in the application of the infringement of Haisla Nation aboriginal rights.

1734. The following additional conditions would improve on the proposed potential conditions issued by the Panel or more fully capture NG's commitments:

Rare Plan Community Restoration

1735. Implementation of a rare ecological community restoration program as described by Mr. Reid.

Mr. Reid, Transcript Vol. 104, lines 29141-29149

Enhanced Pipeline Inspection

1736. The proponent has stated that it will implement pipeline inspection procedures along high-risk segments of the pipeline that exceed standard Enbridge integrity management processes. This commitment should become a condition. The condition should be that the portion of the pipeline in the Kitimat River drainage area will be inspected annually through high-resolution internal inspection tools such as a GEOPIG in the first year of operations, ultrasonic crack detection within the first two years of operations, ultrasonic corrosion detection and ultrasonic magnetic flux leakage.

Exhibit B83-10, p. 23

Meteorological Monitoring

1737. NG should be required to implement and maintain additional meteorological monitoring in the Kitimat River Valley in order to be prepared for emergencies. NG should be required to put into place additional meteorological stations in the OWA and CCAA:

> **5692.** I think the other point I'd just make is that we have committed to putting in place meteorological stations for the project to give us the information so that we can -- additional information for informing our environmental limits that we'll put in place for operations and visibility could definitely be included on those stations that get put in place and will be planned out during the detailed design process.

Mr. Cowdell, Transcript Vol. 161, line 5692

1738. This commitment has not been captured in either the proposed potential conditions or in NG's table of commitments. It should be included in the list of marine voluntary commitments.

Vessel Strikes

1739. NG should be required to expand its vessel strike analysis to include a sub-analysis of potential effects on grey whales.

Ms. Ahrens, Transcript Vol. 115, line 14628

IX. CLOSING COMMENTS AND RECOMMENDATION REQUIRED

1. Closing Comments Regarding Process

1740. Testing the evidence put forward by NG in support of its application proved extremely challenging for a number of reasons. The evidence was extensive and evolved with the hearing process, making it difficult to stay current with the evidence.

1741. In addition, the following particular challenges to testing NG's evidence should be taken into consideration by the Panel when it ascribes weight and assesses reliability of the evidence.

1.1 Failure to Fully Respond to Information Requests

1742. The Haisla Nation submitted a number of information requests to NG to which it never received complete responses. Despite a motion seeking to have answers provided, the Haisla Nation and other parties who made similar motions were largely directed to the oral questioning phase to test the evidence further.

Exhibit D80-16-1

1.2 Failure to Answer Questions Helpfully in Oral Questioning

1743. Experts are supposed to be objective and their role is to assist the party weighing the evidence, in this instance the Panel. Former Supreme Court of Canada Chief Justice Beverly McLachlin has written about the role of expert witnesses in court settings. These words are, in the Haisla Nation's submission, instructive for the role of experts appearing before an administrative tribunal such as the Panel:

> Above all, experts must restore the Court's faith in them by reaffirming their objectivity. An expert who contests too obviously for one side or the other loses his or her credibility. He reduces himself to the status of a hired gun, nothing more. … The expert must bear in mind that regardless of who is paying him, his duty is to tell the truth, **his role is to assist** the Court (emphasis added).[180]

1744. In numerous instances, NG's experts answered oral questions in a manner that was unhelpful to the Panel or the interveners seeking to test the evidence. The Panel ought to take this into consideration when ascribing weight or assessing the reliability of evidence.

1.2.1 Avoiding Providing a Direct Response

1745. On numerous occasions, NG sought to avoid answering questions by seeking to deflect the question or by answering a different question.

1746. An example of NG seeking to avoid a question, first by suggesting it had been answered in an IR and then by trying to deflect the question, can be found at Transcript Vol. 147, lines 20079 to 20128. A portion of this transcript is set out below:

[180] B. McLachlin, "The Role of the Expert Witness," (Sept. 1990), 14:3 Prov. Judges J. 27.

20079. **MS. GRIFFITH:** I'll rephrase the question in terms of knots. But just for the record, it's very difficult to keep moving between these different -- the measurements and units.
20080. So -- most of Northern Gateway's river data is in metres per second, not knots, which was why I was trying to put it into metres per second. But I will rephrase the question.
20081. Is it fair to say that Northern Gateway will not be able to contain non-floating oils in waters moving faster than 0.75 knots?
--- (A short pause/Courte pause)
20082. **MR. OWEN McHUGH:** So this question has been specifically addressed in a response to the Haisla IR on this document in B132-2 on page 166 -- I hope it's the same.
20083. **MS. GRIFFITH:** That might have been 163 that we were on earlier.
20084. **MR. OWEN McHUGH:** So the IR number is 4.102, which is in page number -- it's 160. Not Adobe page, though. And response (f). This is the response to your question.
20085. **MS. GRIFFITH:** That's the response that was provided to the IR, but I don't think it's responsive to the specific question I asked, which is, is it fair to say that Northern Gateway would not be able to contain non-floating oils in waters moving faster than 0.75 knots?
20086. **MR. OWEN McHUGH:** Essentially, that's the exact same question. And the -- what we describe is that the methods identified in those tables are most effective in low flowing areas.
20087. **MS. GRIFFITH:** Mr. McHugh, the question may be the same, but I don't think (f) answers the question.
20088. **DR. ELLIOTT TAYLOR:** I believe that what we -- what's important to recall here is we're talking about an oil that's floater, primarily. It's on the surface of the water.
20089. We've already gone -- I think there's been a lot of discussion about the relative densities of this oil. And so again, we have to recognize there's water -- oil on the surface, which is where your conventional boom is working. And as Mr. McHugh described, there -- you change your tactics according to different flow velocities.
20090. If there is oil that has been entrained -- and I think our esteemed modeller has described the process there -- if it's in the water column because of turbulence that keeps it in the water column and flow when it gets to a quieter location, that, again can refloat to the surface.
20091. And so the last bit we're looking at is oil that may settle because it's actually made contact with particles, and that's your sunken oil.
20092. Can you intercept those different phases of oil through the water column? It's much easier -- most effective at the surface, less effective in the water column. And the natural settling points are where you would look, again, for the sunken oil. And there are some possible strategies for oil that is sunken in terms of containment.

1747. And:

> **20109**. And those other options for responding to oil in the water column, are they effective at speeds above 0.75 knots?
> **20110**. **DR. ELLIOTT TAYLOR:** The -- some of these tactics would be used and potentially could be oriented to work more effectively at higher velocities but they would be preferentially located at spots where you have lower flow. Which is -- again goes back to part of this whole process of identifying flow conditions and knowing the flow conditions at control points downstream so that you're using these at -- at an optimum location.
> **20111**. So you don't go to a higher speed location and say well let's put it here and it's not going to work. Choose your -- choose the best places to make the -- make most efficiency out of your -- out of the tactics that you're going to be using.
>
> *Mr. McHugh and Dr. Taylor, Transcript Vol. 147, lines 20079-20111*

1748. An example of NG answering a different question than was asked can be found at Transcript Vol. 148, lines 22382 – 22387, where the Panel Chairperson asks whether an acute effect would exacerbate a chronic effect and the witness' answer is directed at whether chronic exposure would exacerbate acute effects and whether one acute episode would predispose a fish to being more susceptible to another acute episode:

> **22382**. **THE CHAIRPERSON:** This is an area that I'm interested in making sure I understand. So do I hear your evidence to be that there aren't cases, ecologically, from the modelling in the study that you've done, where an acute effect would exacerbate a chronic effect?
> **22383**. **DR. MALCOLM STEPHENSON:** Again, let me speak to the Blue-sac disease endpoint first.
> **22384**. A fish exposed as a freshly fertilized egg, given sufficient exposure at the right time, could develop a sub-lethal deformity that would still allow the embryo to hatch and the fish to emerge from the gravel and swim away as a juvenile fish.
> 22385. There could be effects on the fitness of that individual as a result of the -- as a lingering result of the deformity, in effect an injury but I don't believe that that would predispose the fish subsequently to narcotic effects of hydrocarbon exposure that would be in any way really different than a fish that had not had that previous exposure.
> **22386**. On the narcosis side, as I indicated, a sub-lethal exposure of short duration to a narcotic chemical is something that would result in the accumulation, temporarily, of hydrocarbons by the fish. When the sub-lethal exposure was removed, the fish would metabolize or excrete those hydrocarbons and return to a normal state.
> **22387**. And no, I don't believe that that fish would then be any more susceptible to a future episode of narcotic intoxication than a fish that was previously unstressed.
>
> *Dr. Stephenson, Transcript Vol. 148, lines 22382-22387*

1749. While this may have been inadvertant, the result is that the questions remained unanswered.

1750. Another way NG avoided providing direct answers was to rephrase and refocus the question:

> **7757**. To touch on another portion of ALARP, it includes reference to reasonably -- as low as reasonably practicable.
> **7758**. Who makes the ultimate determination as to what is reasonable in terms of the risk level that will be acceptable in all segments of the project?
> **7759**. **MR. JAMES MIHELL:** There is no standard that I can point to that says this is the definition of ''reasonably'' and this is the definition of ''practicable''. It's a principle that establishes a point of diminishing returns.
> **7760**. And, ultimately -- I guess the reason why I threw out the example initially of third-party damage is that it did a good job of illustrating the concept that, as we -- if we were to contemplate further increases in wall thickness, neither the models nor the empirical evidence would suggest that you would accrue great benefit in terms of risk reduction from the perspective of third-party damage.
> **7761**. So it requires some subjectivity, some engineering judgment and some evaluation and I can't provide you with a hard and fast rule of what the definition of ''reasonably'' is or ''practicable'' is.
> **7762**. **MR. McCORMICK:** Thank you.
> **7763**. And just for clarification, at no point in my question did I raise third-party damage, wall thickness or did I request a definition of the word ''reasonable''.
> **7764**. The first word in the question was ''who''.
>
> *Trancript Vol. 87, lines 7757-7764*

1.2.2 Using Semantics to Provide Self-Serving Answers

1751. On a number of occasions, NG provided answers based on minor and subtle distinctions in language in a way that was not helpful to the Panel or to interveners asking questions. For example, NG's response to Haisla Nation IR No. 4.51 turned on the qualifier "to a watercourse" in the response, but that qualifier did not exist in the request.

1752. The IR read:

> 4.51 – Small Leak, Large Volume
> …
> Request: a) Is it possible that a small leak that goes undetected for a long period of time could result in a larger volume of released hydrocarbons than a full bore rupture event?
>
> *Exhibit D80-70-2, p. 33*

1753. The Haisla sought to question NG's response, as set out in the ensuing exchange from Transcript Vol. 146, lines 19271-19285:

19271. **MS. GRIFFITH:** Madam Clerk, could we please have B80-3, page 197?
19272. In the third paragraph down the -- I think it's the second sentence which is about four lines in, beginning with "different oil spill scenarios". If I could just ask the witnesses to read that remaining -- from there to the end of the paragraph please.
19273. In its IR Number 4.51 the Haisla Nation referred to this caveat in the EHHRA which acknowledged that -- acknowledged the possibility of small leaks going undetected and causing significant adverse effects and potentially involving smaller or larger volumes of oil that are modelled. When asked to confirm that this was possible, Northern Gateway stated in its response that:

> *"It is […] unlikely that a small leak occurring for an extended period would result in a larger volume released to a watercourse than a full bore rupture."*

19274. Was this IR response provided by the same person who wrote the EHHRA report?
19275. **MR. LANGEN:** Just for the record, it says it is "highly unlikely".
19276. **MR. PAUL ANDERSON:** Could you please tell us what IR you're referring to, please?
19277. **MS. GRIFFITH:** Yes, it's Exhibit 132-2, IR 4.51 which is on page 89, and it's answer (a) -- the request is there -- "Is it possible that a small leak…" -- it goes on. And then the response is there:

> *"It is highly unlikely that a small leak occurring for an extended period would result in a larger volume released to a watercourse than a full bore rupture."*

19278. And I'm just wondering whether the -- there's a contradiction there, in my mind, between the EHHRA and this response. So I'm wondering whether the same person wrote the report and provided the response.
--- (A short pause/Courte pause)
19279. **MR. PAUL ANDERSON:** The short answer to your question is that Dr. Stephenson did have a hand in writing both the IR response and in the EHHRA, so I'll ask him to comment on the -- your -- what you perceive as an apparent contradiction.
19280. **DR. MALCOLM STEPHENSON:** There is in fact, no contradiction. A full bore rupture results in a large amount of oil reaching a watercourse in a short period of time.
19281. If we could go back to the IR -- Madam Clerk, if we could go back to the IR?
19282. **MR. RAY DOERING:** I believe that's the B132-2?
19283. **DR. MALCOLM STEPHENSON:** Thank you.
19284. The key wording here is:

> *"…highly unlikely that a small leak occurring for an extended period would result in a larger volume released to a watercourse..."*

19285. That is the particular phrase "released to a watercourse" is what differentiates the two scenarios.

1754. These types of responses made it particularly challenging for intervenors to test the evidence and were, it is respectfully submitted, not helpful.

1.3 Compartmentalized Information and Witness Panels

1755. NG's evidence was presented in a compartmentalized fashion, requiring repeated cross reference to technical data reports to understand the evidence in the application. Given the different project components it is understandable that NG had to make choices about how to present its evidence, both in written form and for oral questioning. NG's strict insistence on only answering questions during oral hearings if they were for subject matters ascribed to a particular witness panel was, however, frustrating. This is clearly demonstrated throughout the transcripts for oral questioning.

1756. The Haisla Nation submits that this approach also allowed NG to avoid providing answers to legitimate questions relating to its application. Given the cumbersome nature of the oral hearing process, NG could, in the submission of the Haisla Nation, have taken a less compartmentalized approach to oral questioning, particularly when a number of witnesses sat repeatedly on different witness panels and ought to have had the ability to respond (for example, Mr. Green and Mr. Anderson sat on a number of the witness panels).

1.4 Timing of Information

1757. Finally, NG's gathering of information in support of the proposed project was cut off as a result of its decision to file its application at a certain point in time. Critical information relevant to the assessment of the proposed project has not been provided. This lack of information undermines the reliability of NG's application and the ability of the Panel to properly assess the proposed project.

1758. It must be borne in mind that it was NG's choice to file its application when it did. Any information deficiencies are of its own doing. Just because NG has chosen to live with these information deficiencies does not mean that the Panel, the Haisla Nation or the Canadian public should.

2. Panel Recommendations and Findings Requested

1759. The Haisla Nation has set out support for and submits that the Panel should make the following recommendations and findings:

Haisla Nation Aboriginal Rights and Title

1. The Panel should find that the Haisla Nation has a very high strength of claim to its Territory, and that it has provided clear, cogent, and persuasive evidence of exclusive use and occupation of its Territory that pre-dates 1846.

2. The Panel should find that Haisla Nation members rely on the lands, water, and resources of Haisla Nation Territory in the exercise of their aboriginal rights, and that the exercise of these rights entail fishing, hunting, trapping, and gathering in Haisla Nation Territory and, more specifically, in the *wa'wais* which will be impacted by the proposed project.

3. The Panel should find that Crown consultation with the Haisla Nation has, up to this point, not been adequate.
4. The Panel should find that the proposed Crown consultation process raises serious doubts about whether it can be meaningful and whether it can be relied on to discharge the honour of the Crown.

Economic Benefits and Burdens

5. The Panel should recommend against the issuance of a s. 52 certificate for the Condensate Import Line.
6. The Panel should find that NG has not established that the proposed project is needed and in the public interest.

Environmental Effects of Proposed Pipelines

7. The Panel should determine that it cannot reasonably assess the significance of adverse effects from the proposed project on the basis of the information provided by NG.
8. The Panel should determine that the proposed project is likely to result in significant adverse effects to rare ecological communities that cannot be mitigated.
9. The Panel should find that NG has not provided enough information to allow a reasonable assessment of the risk of a spill from the proposed pipelines.
10. The Panel should find that NG has not adequately considered the factors that contribute to the risk of a spill from the proposed pipelines.
11. The Panel should find that NG's assessment of the toxicity of oil when spilled from the proposed pipelines is not reliable because it does not consider the full range of products that could be shipped on the proposed project, it does not consider all the potential pathways of effect, and it does not fully consider chronic toxicity.
12. The Panel should find that NG has not demonstrated that spill response will be able to mitigate the effects of a spill from the proposed pipelines.
13. The Panel should find that the proposed project is likely to result in significant adverse environmental effects from the proposed pipelines.
14. The Panel should conclude that these significant adverse environmental effects cannot be justified due to the profound impact they would have on the Haisla Nation, on Haisla Nation Territory, and on Haisla Nation cultural heritage.

Environmental Effects of Proposed Kitimat Terminal

15. The Panel should find that the scale of the destruction of Haisla Nation CMTs at the proposed terminal site will result in significant adverse environmental effects on Haisla Nation cultural heritage and on Haisla Nation historical, archaeological and paleontological sites.

16. The Panel should recommend that additional baseline information is required about fish and fish habitat at the proposed marine terminal, as required by the *Scope of Factors* before a decision statement can be issued.

17. The Panel should find that NG has failed to provide the information required about baseline conditions at the proposed marine terminal site and that this prevents the Panel from determining that the proposed project is not likely to cause significant adverse environmental effects.

18. The Panel should recommend that additional information is required about fish habitat compensation, as required by the *Scope of Factors*, before a decision statement can be issued.

19. The Panel should find that NG has failed to provide the information required about fish habitat compensation for HADDs at the proposed marine terminal site and that this prevents the Panel from determining that the proposed project is not likely to cause significant adverse environmental effects.

20. The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment at the proposed marine terminal is not reliable because it does not consider the full range of products that could be shipped on the proposed project, it does not consider all the potential pathways of effect, and it does not fully consider chronic toxicity.

21. The Panel should find that NG has not demonstrated that spill response will be able to mitigate the effects of a spill from at the marine terminal.

22. The Panel should find that the construction and operations of the proposed Kitimat Terminal will result in significant adverse environmental effects on Haisla Nation cultural heritage and on Haisla Nation historical, archaeological and paleontological sites.

23. The Panel should find that an accident or malfunction at the proposed Kitimat Terminal will result in significant adverse environmental effects on the Haisla Nation`s current use of lands and resources for traditional purposes.

24. The Panel should find that the construction and operations of the proposed Kitimat Terminal will result in significant adverse environmental effects by negatively impacting Haisla Nation cultural heritage.

25. The Panel should find that the proposed project is likely to result in significant adverse environmental effects at the marine terminal.

26. The Panel should conclude that these significant adverse environmental effects from the proposed Kitimat Terminal cannot be justified due to the profound impact they would have on the Haisla Nation, on Haisla Nation Territory, and on Haisla Nation cultural heritage.

Environmental Effects of Marine Shipping

27. The Panel should find that NG's assessment of the toxicity of oil when spilled to the marine environment from tankers is not reliable because it does not consider the full range of products that could be shipped on the proposed project, it does not consider all the potential pathways of effect, and it does not fully consider chronic toxicity.

28. The Panel should find that NG has not demonstrated that spill response will be able to mitigate the effects of a spill from marine shipping.

29. The Panel should find that the marine shipping associated with the proposed project is likely to result in significant adverse environmental effects by prohibiting the Haisla Nation's current use of lands and resources for traditional purposes.

30. The Panel should find that the marine shipping associated with the proposed project is likely to result in significant adverse environmental effects by negatively impacting Haisla Nation cultural heritage.

31. The Panel should find that the proposed project is likely to result in significant adverse environmental effects from marine shipping.

32. The Panel should conclude that these significant adverse environmental effects from marine shipping cannot be justified due to the profound impact they would have on the Haisla Nation, on Haisla Nation Territory, and on Haisla Nation cultural heritage.

Public Interest

33. The Panel should find that in the totality, the impacts and risks associated with the proposed project outweigh the potential benefits, so the proposed project is not in the public interest.

34. The Panel should find that the impacts and risks associated with the project are so disproportionately distributed compared to where the benefits lie, that the proposed project is not in the public interest.

35. The Panel should find that the potential impacts of the proposed project on the Haisla Nation are of a nature that cannot be justified, so the proposed project is not in the public interest.

36. The Panel should find that the potential impacts to asserted Haisla Nation aboriginal rights and title from the proposed project are such that the proposed project cannot be found to be in the public interest in the absence of meaningful consultation. The engagement that has occurred to date cannot be considered meaningful consultation and is missing significant components of a meaningful consultation process. The current status of engagement and the federal government imposition of a 6-month time limit to complete consultation raise serious concerns that meaningful consultation will not be possible. Therefore the proposed project is not in the public interest.

1760. The Haisla Nation requests that the Panel's report to the Governor-in-Council incorporate these findings and recommend that no certificate be issued for the proposed project pursuant *to NEBA*, and that no positive decision statement is possible under *CEAA 2012*.

All of which is respectfully submitted on behalf of the Haisla Nation, per:

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Appendix I – Tables

Table 4

SUMMARY OF NORTHERN GATEWAY BENEFIT CALCULATION (Real Millions of 2012 U.S. Dollar per Year, Unless Noted)																		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Gross Canadian Producer Benefit	2,281.6	4,997.2	4,932.9	3,734.3	2,533.9	2,437.5	3,835.0	3,905.0	3,851.1	4,284.4	3,701.9	3,709.6	3,796.1	3,321.4	3,527.4	4,161.9	3,742.4	4,327.6
Less Canadian Refinery Impact	(424.7)	(948.9)	(884.7)	(691.1)	(442.5)	(382.7)	(596.7)	(566.4)	(532.2)	(522.7)	(445.7)	(423.2)	(417.9)	(359.1	(314.3)	(296.1)	(241.0)	(280.7)
Less Northern Gateway Committed Toll	(685.4)	(687.5)	(689.7)	(689.4)	(756.2)	(758.0)	(759.8)	(759.5)	(763.4)	(765.3)	(767.9)	(768.4)	(772.6)	(774.7)	(776.8)	(563.9)	(561.1)	(547.4)
Net Canadian Benefits	**1,171.5**	**3,360.8**	**3,358.5**	**2,353.7**	**1,335.1**	**1,296.8**	**2,478.6**	**2,579.2**	**2,555.6**	**2,996.4**	**2,488.3**	**2,518.0**	**2,605.6**	**2,187.7**	**2,436.4**	**3,302.0**	**2,940.3**	**3,499.5**

Appendix II – List of Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada
API	American Petroleum Institute
ARD	Acid Rock Drainage
BBL	Oil Barrel
BCA	Benefit-Cost Analysis
BCMOE	British Columbia Ministry of Environment
BPD	Barrels per Day
BSD	Blue Sac Disease
CAPP	Canadian Association of Petroleum Producers
CCAA	Confined Channel Assessment Area
CG	Canadian Coast Guard
CEAA	Canadian Environmental Assessment Act
CMT	Culturally Modified Tree
COPC	Chemical of Potential Concern
DFO	Fisheries and Oceans Canada
EC	Environment Canada
EC50	Half Maximal Effective Concentration
EGS	Ecological Goods and Services
EHHRA	Ecological and Human Health Risk Assessment
EPA	United States Environmental Protection Agency
EPMP	Environmental Protection Management Plan
ERA	Ecological Risk Assessment
ESA	Environmental and Socio-Economic Assessment
EVOS	Exxon Valdez Oil Spill
FLC	Fisheries Liaison Committee
FLOC	Frequency of Loss of Containment
GDP	Gross Domestic Product
HADD	Harmful Alteration, Destruction and Disruption of Fish Habitat
HDD	Horizontal Directional Drilling
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IR	Information Request or Indian Reserve, as the context dictates
JRP	Joint Review Panel
KI	Key Indicator
LNG	Liquefied Natural Gas
LRF	Lloyd's Register-Fairplay
LRP	Least Risk Period
MCTS	Marine Communications and Traffic Services
MEEMP	Marine Environmental Effects Monitoring Program
MRP	Mean Return Period
MSDS	Material Safety Data Sheet
NEB	National Energy Board
NEBA	National Energy Board Act
NG	Northern Gateway
NRCan	Natural Resources Canada
NTSB	United States National Transportation Safety Board
OPEP	Oil Pollution Emergency Plan
OSRP	Oil Spill Response Place

OWA	Open Water Area
PAH	Polycyclic Aromatic Hydrocarbon
PDA	Project Development Area
PEAA	Project Effects Assessment Area
QRA	Quantitative Risk Assessment
ROC	Response Options Calculator
ROW	Right of Way
SARA	Species at Risk Act
SCADA	Supervisory Control and Data Acquisition
SIMAP	Integrated Oil Spill Impact Model System
SQRA	Semi-Quantitative Risk Assessment
TAN	Total Acid Number
TC	Transport Canada
TDR	Technical Data Report
TLU	Traditional Land Use
TPAH	Total Polycyclic Aromatic Hydrocarbons
TSA	Transportation Service Agreement
TSS	Total Suspended Solids
VEC	Valued Environmental Component
VLCC	Very Large Crude Carrier
VTS	Vessel Traffic Services
WCSB	Western Canada Sedimentary Basin

Appendix III – List of Authorities

Case Law

Alberta Wilderness Assn. v. *Express Pipeline Ltd.* (1996), 137 D.L.R. (4th) 177 (F.C.A.).

Bow Valley Naturalists Society v. *Canada (Minister of Canadian Heritage)*, [2001] 2 FC 461 (FCA).

Canadian Transit Co. v. *Canada (Minister of Transport)*, 2011 FC 515.

Canadian Wildlife Federation Inc. v. *Canada (Minister of the Environment)* (1989), 34 F.T.R. 1.

Cheslatta Carrier Nation v. *B.C.*, 2000 BCCA 539.

Conseil des innus de Ekuanitshit c. *Canada (Procureur général),* 2013 FC 418.

Delgamuukw v. *British Columbia*, [1997] 3 S.C.R. 1010.

Friends of the Island Inc. v. *Canada (Minister of Public Works),* [1993] 2 F.C. 229.

Gitxsan First Nation v. *B.C. (Min. Forests*), 2002 BCSC 579.

Haida Nation v. *BC (MOF),* [2004] 3 S.C.R. 511, 2004 SCC 73.

Halfway River First Nation v. *B.C. (Min. Forests),* [1997] 4 C.N.L.R. 45 (BCSC), 199 BCCA 470.

Inverhuron & District Ratepayers Ass. v. *Canada (Minister of the Environment),* 2001 FCA 203.

Kwikwetlem First Nation v. *British Columbia (Utilities Commission),* 2009 BCCA 68.

Métis Nation of Alberta Region 1 v. *Joint Review Panel*, 2012 ABCA 352.

Mikisew Cree First Nation v. *Canada (Min. Heritage*), 2001 FCT 1426.

Mitchell v. *M.N.R.*, [2001] 1 S.C.R. 911, 2001 SCC 33.

Musqueam Indian Band v. *B.C. (Min. Sust. Res. Mgmt.),* 2005 BCCA 128.

NEB Reasons for Decision, *AEC Suffield Gas Pipeline Inc.*, GH-2-2000, August 2000.

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NEB Reasons for Decision, *Enbridge Southern Lights LP*, OH-3-2007, February 2008.

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NEB Reasons for Decision, *Nova Gas Transmission Ltd.*, GH-001-2012, January 2013.

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NEB Reasons for Decision, *Sumas Energy 2, Inc.*, EH-1-2000, March 2004.

NEB Reasons for Decision, *TransCanada Pipelines Ltd.*, MH-1-2006, February 2007.

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