

APPENDIX A

**BEAR HEAD LIQUEFIED NATURAL GAS TERMINAL FEDERAL-
PROVINCIAL ENVIRONMENTAL ASSESSMENT AGREEMENT; AND
COMMENTS ARISING FROM THE FEDERAL AND PROVINCIAL REVIEW
OF THE DRAFT ENVIRONMENTAL ASSESSMENT OF THE ANEI BEAR
HEAD LNG TERMINAL AND PROPONENT RESPONSES**

COPY

**Bear Head Liquefied Natural Gas Terminal
Federal-Provincial Environmental Assessment Agreement**

This Agreement dated this **MAR 08 2004** is made in duplicate

AMONG

**Her Majesty the Queen in Right of the Province of Nova Scotia
as represented by the Minister of Environment and Labour, hereinafter referred to as "NSEL"**

OF THE FIRST PART

AND

**Her Majesty the Queen in Right of Canada as represented by
the Minister of Fisheries and Oceans Canada, hereinafter referred to as "DFO"**

OF THE SECOND PART

is reached to coordinate the conduct of a Class I environmental assessment pursuant to the *Environmental Assessment Regulations of the Nova Scotia Environment Act* and a federal screening pursuant to the *Canadian Environmental Assessment Act (CEAA)*.

Access North East Energy's proposed Liquefied Natural Gas Terminal at Point Tupper Nova Scotia involves the construction of a facility for the liquefaction, storage, or regasification of liquefied natural gas, with associated marine works that include construction of a jetty platform, ship berthing and trestle structure, dolphins, navigational aids, and unloading facilities.

The proposal is a Class I undertaking pursuant to the *Nova Scotia Environmental Assessment Regulations*. The proponent must register the proposed project for an environmental assessment pursuant to the *Environmental Assessment Regulations* and Part IV of the *Environment Act*.

It has been determined that a screening level EA pursuant to the clause 5(1)(d) of *Canadian Environmental Assessment Act (CEAA)* must also be conducted because DFO considers issuing a subsection 35(2) *Fisheries Act* authorization and a paragraph 5(1)(a) *Navigable Waters Protection Act* approval for the project.

Pursuant to subsection 47(1) of the *Nova Scotia Environment Act*, when an undertaking is also subject to another jurisdiction's environmental assessment review, the Minister may enter into an agreement with the other Government agency to conduct a joint review and to adopt, for the purposes of the review, all or part of the procedures for environmental assessment, including time frames.

**Bear Head Liquefied Natural Gas Terminal
Federal-Provincial Environmental Assessment Agreement**

The Parties, or their designates, will agree on the scope of the environmental assessment.

The Parties, or their designates, will seek to ensure the proponent prepares and submits one environmental assessment document in a manner that meets the requirements of CEAA and the requirements for registration of a Class I undertaking pursuant to the *Environmental Assessment Regulations*.

The Parties, or their designates, will establish a mutually agreeable workplan. NSEL will make and release its decision pursuant to Section 13 of the Nova Scotia *Environmental Assessment Regulations* and DFO will take their course of action pursuant to the CEAA, in a coordinated manner within 90 calendar days of registration pursuant to the *Environmental Assessment Regulations*. The Parties shall retain their respective decision-making authority.

The Parties, or their designate, will consult with each other during the environmental assessment process and prior to announcing their respective decisions.

The Parties may amend this Agreement, subject to acceptance by all Parties. A Party, without the consent of the other Parties may, upon thirty (30) days written notice, withdraw from this Agreement and complete an independent environmental assessment.

This Agreement is not intended to be a legally binding instrument or give rise to any legal rights not otherwise held by the Parties.

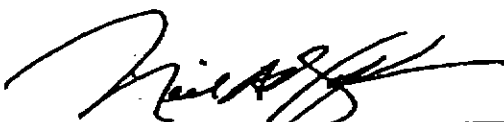
This Agreement may be executed in duplicate counterparts, each of which so executed shall be deemed to be an original, and such counterparts together shall constitute one and the same original agreement.

**Bear Head Liquefied Natural Gas Terminal
Federal-Provincial Environmental Assessment Agreement**


Rosalind Penfound
A/Deputy Minister
Nova Scotia Environment and Labour

March 08, 2004
Date

**Bear Head Liquefied Natural Gas Terminal
Federal-Provincial Environmental Assessment Agreement**



Neil Bellefontaine
Regional Director-General
Fisheries and Oceans Canada
Maritimes Region

4/3/04

Date

**COMMENTS ARISING FROM THE FEDERAL AND PROVINCIAL
REVIEW OF THE DRAFT ENVIRONMENTAL ASSESSMENT
OF THE ANEI BEAR HEAD LNG TERMINAL
AND PROPONENT RESPONSES**

Comment:

NSEL-CEAA-01-01	Mark McLean Senior Program Officer	These comments mainly address process issues within the document and do not address any technical deficiencies in the report.
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Response:

Comment noted.

Comment:

NSEL-CEAA-01-02	Mark McLean Senior Program Officer	Page ES-i (first paragraph) - The document states “This report satisfies the requirements of an environmental screening under the Canadian Environmental Assessment Act (CEAA) and a Class I Registration under the Nova Scotia Environment Act.” A screening under CEAA also requires a Screening Report (subsection 18(1)(b)) which will be prepared by the RA (DFO on behalf of DFO and Transport Canada). The wording should reflect that the report will provide the basis for the required Screening Report and not satisfy the requirements of a screening.
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Response:

Text in the Executive Summary, Section 1.0 and Section 9.0 of the EA document has been modified to address this comment.

Comment:

NSEL-CEAA-01-03	Mark McLean Senior Program Officer	Page 1-4 (last paragraph) - The document should reflect the recent transfer of the Navigable Waters Protection Act to Transport Canada which would now make Transport Canada an RA for this project. Please consult DFO or CEAA for more information on how this will influence the EA process.
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Response:

Text in Section 1.4 of the EA document has been modified to address this comment.

Comment:

NSEL-CEAA-01-04	Mark McLean Senior Program Officer	Page 1-5 (first paragraph) - This section should provide more detail on the federal scope of the project. It should be made clear the DFO has scoped only the marine terminal and not the LNG facility itself.
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Response:

Text has been added in Section 1.4 of the EA document to address this comment.

Comment:

NSEL-CEAA-01-05	Mark McLean Senior Program Officer	Page 7-2 (last paragraph) – Transport Canada should be included as an RA.
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Response:

Text in Section 1.4 and paragraph four of Section 7.1 of the EA document have been changed to reflect this comment.

Comment:

NSEL-CEAA-01-06	Mark McLean Senior Program Officer	Page 4-2 (last paragraph) – TERMPOL is referred to several times in the document but does not appear to be fully explained. A more detailed explanation of this process and how it fits with the EA process should be provided.
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Response:

Additional text has been added to the last paragraph in Section 4 of the EA document address this document.

Comment:

NSEL-CEAA-01-07	Mark McLean Senior Program Officer	Page 5-5 (2nd paragraph) – Those concerns and issues raised during the public consultation programs should be provided and a description of how they were addressed included in the report.
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Response:

Text and Table 5.4 have been added to Section 5.8 of the EA document to address this comment.

Comment:

NSEL-CEAA-01-08	Mark McLean Senior Program Officer	Page 8-103 - Will the MKS be available for review in the final EIS document? How will the results be considered as part of the EA review if it is not included?
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Response:

The Interim Mi'Kmaq Knowledge Study (MKS) has now been included in Appendix J of the EA document. Sections 6.2.5 and 8.2.5 of the EA document have been modified to reflect this update.

Comment:

NSEL-CEAA-01-09	Mark McLean Senior Program Officer	Page 8-134 – The NSPI/Logistec Terminal EA has been completed by Nova Scotia Environment and Labour and DFO.
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Response:

Text in paragraph 12 of Section 8.4 of the EA document has been modified to reflect this comment.

Comment:

NSEL-DFO-01-01	Reg Sweeney Habitat Evaluation Scientist	In general reviewers found the document well written with the VEC's, VSC's, and analysis of effects well chosen and explained.
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Response:

Comment noted.

Comment:

NSEL-DFO-01-02	Reg Sweeney Habitat Evaluation Scientist	The document would be improved by a Section clarifying the Species at Risk Act (SARA) under which regulations are expected in June of this year, how it relates to COSEWIC, CEAA...and how this relates to the Nova Scotia Endangered Species Act. Some of the information is in the report but scattered throughout several sections. Drawing this information together and an introduction to the topic would be beneficial, especially as it is an emerging topic in EA's.
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Response:

Section 1.4.1 Species at Risk, has been added to the EA document to address this comment.

Comment:

NSEL-DFO-01-03	Reg Sweeney Habitat Evaluation Scientist	Page 1.4 - Regulatory and Planning Context - Since the project was registered with CEAA, Navigable Waters Protection Program (NWP) has been transferred to Transport Canada. DFO as an interim measure will continue to conduct the environmental assessment on behalf of NWP, but Transport Canada will likely have to co sign the screening report.
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Response:

Text in Section 1.4 of the EA document has been modified to address this comment.

Comment:

NSEL-DFO-01-04	Reg Sweeney Habitat Evaluation Scientist	Figure 6.19 Land Use Zoning - Colour coding on wetlands and residential properties is too similar to differentiate. Please re-code one.
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Response:

Residential property and wetland colour codes on Figure 6.19 have been modified to address this comment.

Comment:

NSEL-DFO-01-05	Reg Sweeney Habitat Evaluation Scientist	Page 3-5. Forest fires...this statement that a forest fire in this area is not a credible event should be verified by DNR. Forest fires are a credible and potentially serious event in Nova Scotia. Analyses should focus on the impact, if any; a fire would have on the facility.
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Response:

It is agreed that forest fires in Nova Scotia are potentially serious and text has been modified in paragraph seven of Section 3.5 in the EA document. As discussed in Section 8.2.6.4 of the EA document, adequate resources such as fire, medical and police, will be ensured due to appropriate planning with emergency responders. The Facility Emergency Response and Contingency Plan will also have provisions for fire protection, including measures such as providing cooling water to vulnerable equipment/containment handling hazardous substances. Hazard mitigation and fire protection measures are also discussed in Section 2.6.2 of the EA document.

Additional analysis regarding the risk of forest fire to the facility is currently being undertaken by the proponent in response to this comment and discussions Environment Canada.

Comment:

NSEL-DFO-01-06	Reg Sweeney Habitat Evaluation Scientist	Page 8-25. Section 8.1.4.4. The Policy for the Management of Fish Habitat is based on Sections 20-22, 30, 32, and 35 of the Federal Fisheries Act in addition to the Sections 36 to 42 mentioned in the report.
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Response:

Comment noted and additional relevant sections have been added to the text.

Comment:

NSEL-DFO-01-07	Reg Sweeney Habitat Evaluation Scientist	Section 8.1.4 Marine Benthic Habitat and Communities - There is only limited description of the intertidal zone and no discussion of potential impacts on the intertidal zone during construction and operation.
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Response:

Paragraph three has been added under Section 6.1.7.1 Benthic Habitat and Communities to address the description of the intertidal zone. The assessment of the benthic environment interactions with the Project included intertidal and subtidal zones. Where applicable, text in Section 8.1.4 has been modified to reflect this.

Comment:

NSEL-DFO-01-08	Reg Sweeney Habitat Evaluation Scientist	There is no proposal for benthic monitoring or follow-up surveys. A post construction monitoring plan to verify predictions and compare with the baseline data should be proposed for the marine benthic community.
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Response:

A proposed follow up monitoring and survey plan has been added in the text under Section 8.1.4.5 and is reflected in Section 9.1 Mitigation, Follow-up and Monitoring in Table 9.1.

Comment:

NSEL-DFO-01-09	Reg Sweeney Habitat Evaluation Scientist	Section 8.1.5 Marine Fish and Fish Habitat - Discussion of marine fish is quite generic. References only to Scott and Scott 1988 and Breeze et al. 2002 (pages numbers should be provided when referencing Breeze et al. 2002). For example, information on herring limited to description with reference to inshore vs. offshore spawning components. DFO Stock Status Reports and associated Research Documents would provide more specific location of coastal herring spawning components and fisheries (e.g. Little Hope, Glace Bay, Bras D'Or Lakes, etc.).
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Response:

Comment noted and additional (DFO) references have been consulted and references cited, including page numbers, in Section 6.1.7.2 Marine Fish and Fish Habitat.

Comment:

NSEL-DFO-01-10	Reg Sweeney Habitat Evaluation Scientist	No reference to fish species-at-risk within impact assessment.
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Response:

Text has been added under Sections 8.1.5.1 Boundaries, Administrative Boundaries and to paragraph 5 of Section 8.1.5.3 to address this comment.

Comment:

NSEL-DFO-01-11	Reg Sweeney Habitat Evaluation Scientist	No attempt to look at temporal scheduling of potentially sensitive times for fish within impact assessment.
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Response:

Text has been added to paragraph six of Section 8.1.5.4 Analysis, Mitigation and Residual Effects Prediction, Construction to address this comment.

Comment:

NSEL-DFO-01-12	Reg Sweeney Habitat Evaluation Scientist	Atlantic wolffish should be included in the species-at-risk list (special concern).
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Response:

Paragraph six has been added under Section 6.1.7.2 Marine Fish and Fish Habitat, Species at Risk to address this comment.

Comment:

NSEL-DFO-01-13	Reg Sweeney Habitat Evaluation Scientist	Section 8.1.6 Marine Mammals - Relevant experts appear to have been consulted for information on potential presence of marine mammals in the study area.
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Response:

Comment noted.

Comment:

NSEL-DFO-01-14	Reg Sweeney Habitat Evaluation Scientist	SARA is not specifically mentioned as an “administrative boundary” for marine mammals in the effects assessment. Marine mammal species-at-risk should be specifically addressed within the effects assessment, particularly since one harbour porpoise (special concern) has been identified as the most common cetacean in the Strait of Canso (p.6-44). The report does not mention the Right Whale in their discussion of Species at Risk that could potentially be found on occasion in the Canso Strait area. This species migrates up into the Gulf of St. Lawrence and was identified as such in the EA of the Point Tupper Coal Unloading Facility.
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Response:

SARA has been added as an administrative boundary in Section 8.1.5.1 and text has been added to paragraph 6 of Section 6.1.7.3 Marine Mammals, Cetaceans to address this comment.

Comment:

NSEL-DFO-01-15	Reg Sweeney Habitat Evaluation Scientist	Species at Risk - This environmental effects assessment does not specifically address marine species-at-risk, including marine fish species-at-risk. While fish species-at-risk are listed in the overview of the environment section, potential interactions are not addressed within the effects assessment itself. The section on Rare Mammals does not include marine mammals.
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Response:

See response provided for NSEL-EC-01-12 and NSEL-EC-01-14. Please note that the Section entitled Rare Mammals (8.1.9) is intended for terrestrial species while marine mammals are discussed under the Marine Mammals section (8.1.6).

Comment:

NSEL-DFO-01-16	Reg Sweeney Habitat Evaluation Scientist	The Leatherback turtle is also a potential visitor to the Strait.
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Response:

Major breeding grounds for leatherback is in warmer waters well to the southwest of the Project area (Mexico, Florida, and the Caribbean). Maps by Smith (2001) suggest that leatherbacks are common visitors to areas along the Slope and offshore seaward of the Scotian Shelf. Breeze *et al.* (2002, p 230) state that based on limited data it appears that the edge of the Scotian Shelf and regions further offshore are important for sea turtles. Adult leatherbacks are regularly recorded feeding on the Scotian Shelf between June and mid-December (Breeze *et al.* 2002 p 227). They feed primarily on jellyfish and may mistake discarded plastics for their prey (Wynne and Schwartz 1999). Their distribution is dependent on

the location of their prey (Bjorndal 1997). The leatherback turtle is classified as an endangered species by COSEWIC (2003).

REFERENCES:

Bjorndal, K.A. 1997. Foraging ecology and nutrition of sea turtles. In: P.L. Lutz and J.A. Musick (eds). The Biology of Sea Turtles. Boca Raton, FL: CRC Press. 199-232.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2003. Results of the May 2003 COSEWIC species assessment meeting. Internet Publication:

http://www.cosewic.gc.ca/eng/sct0/index_e.cfm

Smith, S.C. 2001. Examination of Incidental Catch from the Canadian Atlantic Large Pelagic Longline Fishery. Prepared for Fisheries and Oceans Canada, Contract No; F5238-000166.

Wynne K. and M. Schwartz. 1999. Guide to marine mammals and turtles of the US Atlantic and Gulf of Mexico. Narragansett, RI. University of Rhode Island.

Comment:

NSEL-DFO-01-17	Reg Sweeney Habitat Evaluation Scientist	Fisheries Resources - Figure 6.15 - Herring and Mackerel landings are combined in this figure, but should be separated if possible.
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Response:

Herring and mackerel landings have been separated on Figure 6.15.

Comment:

NSEL-NS Energy-01-01	Bill O'Halloran	We have no comments on the ANEI Bear Head LNG Terminal Environmental Assessment (Draft), March 2004. Would it be possible to send us a copy of the comments forwarded to the proponent?
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Response:

All comments received from the regulatory review of the Draft EA document are provided in this disposition document.

Comment:

NSEL-NSAF-01-01	Andrew Cameron	I have reviewed the draft report . The report appears to satisfactorily address the marine fisheries and aquaculture concerns. There are no agriculture concerns with the proposal.
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Response:

Comment noted.

Comment:

NSEL-NSAF-01-02	Andrew D. Cameron	Table 8-20 page 8 -96 appears to have a typo. Project Activity - Presence of jetty; Columne - Reversibilty contains a "2". This should likely be an "I" for irreversible .
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Response:

Comment noted. The “2” was a typographic error and has been changed to an “I” for irreversible. Ultimately, the fishing grounds in the immediate vicinity of the marine structure could be returned after decommissioning, but not within the life of the Project, which could be indefinite.

Comment:

NSEL-NSAF-02-01	Murray Hill Director of Inland Fisheries	Staff have reviewed the submitted documentation regarding the Access Northeast Energy Inc. proposal to construct and operate a Liquefied Natural Gas Terminal in the Point Tupper/Bear Head Industrial Park in Richmond County, NS.
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Response:

No response required.

Comment:

NSEL-NSAF-02-02	Murray Hill Director of Inland Fisheries	The section regarding freshwater fish and fish habitat was reviewed. It was noted that both streams mentioned in the document were small and, by sampling with an electrofisher, without fish. It was also noted that water chemistry results indicate both streams have a pH of 4.8 and the fish habitat features described are adequate regarding cover, substrate, and pools/riffles/run. That no fish life was found is surprising given the presence of significant fish/aquatic life in comparable streams at that pH throughout Nova Scotia. Having noted that, I wish to advise that we have no objection or further comment to offer at this time regarding the proposed development.
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Response:

Comment noted.

Comment:

NSEL-NSTPW-01-01	Christene Almon	I have reviewed draft Report on the Environmental Assessment for the proposed Bear Head LNG Terminal and have concluded that the Department of Transportation & Public Works has no concerns regarding the project at this time.
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Response:

Comment noted.

Comment:

NSEL-NSTPW-01-02	Christene Almon	Local TPW personnel will want to have an opportunity to input into the development of the Traffic Management Plan when that occurs.
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Response:

Local NSTPW will be consulted during the development of the Traffic Management Plan.

Comment:

NSEL-SNSMR-01-01	Andrew Paton Municipal Services Division	Two other staff members here at SNSMR and myself have briefly reviewed the DRAFT EA Registration Document for LNG Terminal, proposed by Access Northeast Energy Inc. for Bear Head in Richmond County. We are pleased to see from this document that the proponent has already been consulting with officials of the municipalities in the Canso Strait area and beyond.
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Response:

Comment noted.

Comment:

NSEL-SNSMR-01-02	Andrew Paton Municipal Services Division	In line with current practice we would expect that the Municipality of the County of Richmond, as the municipality in which the undertaking is proposed, would be receiving a copy of the formal E.A. Registration document. In light of the scope of the consultation which has taken place already and the proximity of municipalities, such as the Towns of Port Hawksbury and Mulgrave and the District of Guysborough, to the proposed undertaking might we suggest that they also could be provided with copies of the formal registration document. Alternatively, perhaps they could be notified of the formal E.A. registration and informed as to how they could access the document (i.e. Internet, library etc.). We have no other comments at this time.
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Response:

Proposed locations for display of the Environmental Assessment document for the public review period are the Port Hawkesbury and Mulgrave public libraries to accommodate viewing by the public in communities on both sides of the Strait at varied hours during the week. The schedule for public review will be specified in newspaper advertisements. The EA document will also be available on the NSEL website.

Comment:

NSEL-TC-01-01	MB (Oz) Smith Navigable Waters Protection Program	2.2.1.3 Offshore Facilities - 1st sentence - "strike the reference to Navigational Aids. The requirement for any Navigational Aids will be determined by the Navigable Waters Protection Program as a condition of approval of the project if any Navigational Aids are determined to be necessary."
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Response:

Comment noted; this reference has been stricken.

Comment:

NSEL-TC-01-02	MB (Oz) Smith Navigable Waters Protection Program	Appendix "B" Bear Head LNG Tanker Berth Elevation - "The drawing shows the face of the Terminal as being 366 meters, however there is no indication of how far the berth is out into the waterway from the Ordinary High Water Mark. In regards to NWPP conducting an assessment of the project it is critical that the drawings show how far the berth is from the OHWM when the proponent submits an application for review."
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Response:

The distance from the berth face to the Ordinary High Water Mark is 180 m.

Comment:

NSEL-TC-01-03	MB (Oz) Smith Navigable Waters Protection Program	I don't want to sound like a broken record but... The proponent should be reminded that once an application is made to the NWPP, it could take anywhere from at least 3 months to 2 years for an approval to be issued under the Navigable Waters Protection Act. It would be to their advantage to apply for the in-water "works" as soon as possible.
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Response:

The information required to submit the application for authorization under the *Navigable Waters Protection Act* is currently being compiled and the application will be filed by the proponent in May 2004. ANEI will work closely with the NWP Branch of Transport Canada to ensure that all required

information is supplied and to help expedite the application process. It should be noted that NWP staff and Transport Canada Marine Safety staff have been involved throughout this EA process, and navigation safety has been substantially addressed in the EA. It is expected that this also will help expedite the NWPA application process.

Comment:

NSEL-NSEL-01-01	Darrell Taylor	I have given the Draft Registration Document for Bear Head LNG Terminal a cursory review and find the following relative to fresh surface water resources; The report appears quite thorough and seems to address relevant issues. Nearby watercourses have been identified including Landrie Lake which is an important resource and a Designated Protected Water Supply.
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Response:

Comment noted.

Comment:

NSEL-NSEL-01-02	Darrell Taylor	Fresh surface water resources per se have not been identified as a VEC, albeit appropriate to do so.
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Response:

Surface water was not assessed as a separate VEC in the EA document; however, key surface water issues were addressed in the environmental assessment document in terms of freshwater fish and habitat, wetlands and water supply (surface and groundwater). As such, surface water resources, to the extent of their interaction with the Project, have been adequately addressed.

Comment:

NSEL-NSEL-01-03	Darrell Taylor	Aquatic habitat has been identified as a VEC and a current and expected use of the nearest watercourses (i.e. 2 streams), but other water uses do not appear to have been considered. Some mention of consideration of all potential uses should be included.
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Response:

As part of the Project scoping process, additional water resources such as Landrie Lake were identified and potential interactions were considered (Sections 6.1.1.6 and 8.2.6.3 of the EA document). The study team is unaware of any potential surface water uses that have the potential to interact with the Project, other than those presented in the EA document.

Comment:

NSEL-NSEL-01-04	Darrell Taylor	Mitigative measures to VECs seem appropriate, and possible compensation for wetland disruption also seems advisable.
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Response:

Comment noted. As noted in the response provided for comment NSEL-NSDNR-01-03, the proponent is willing to consider wetland compensation to replace any wetland habitat or functions that may be lost.

Comment:

NSEL-NSEL-01-5	Darrell Taylor	Although other agencies should be consulted regarding impacts to marine resources, it may be advisable to look at alternates to methanol in circulating fluids in the closed loop heat transfer system. Other substances may be less toxic and serve the same function.
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Response:

A thorough analysis has been completed to determine the most suitable substance to use for the closed loop heat transfer fluid. Alternative options include commercial hydrocarbon-based heat transfer fluids (Dowtherm J and Therminol D12), glycol-water, propylene-water, etc. Considerations such as heat transfer properties, efficiency, temperature ranges, and weather impacts, were taken into account to determine that the methanol-water mixture is the most effective and efficient heat transfer fluid for the Terminal. The methanol-water mixture will be contained in a closed loop system. The area around the methanol-water mixture will be paved, curbed and contained to avoid any spills from leaving the property.

Comment:

NSEL-NSEL-01-06	Darrell Taylor	Sampling locations for water samples do not seem to be identified. If they are not, they should be.
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Response:

Comment noted and sampling locations have been added to Figure 6.3 of the EA document.

Comment:

NSEL-NSEL-01-07	Darrell Taylor	The watercourses (i.e. streams) in the immediate vicinity of the proposed undertaking do not appear to be highly significant fish habitat and no other water uses have been identified (to this point). Given that adequate mitigation and/or compensation measures are proposed, the overall risk of impacts to these surface water resources would appear minimal.
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Response:

Comment noted.

Comment:

NSEL-EC-01-01	Stephen Zwicker EA Section	The applicability of the following Canadian Environmental Protection Act (CEPA 1999) provisions and regulations should be acknowledged in the revised EA document: Toxic Substances Substances found to be toxic and listed in Schedule 1 of CEPA 1999 can be controlled by a variety of instruments (e.g. agreements, policies, notices, regulations, guidelines, codes of practice, plans). These instruments may be applicable to any aspect of the life cycle of a toxic substance - from the research and development stage through manufacture, use, storage, transport and ultimate disposal. Toxic substances listed in Schedule 1, and the control instruments applicable to their management, are identified at www.ec.gc.ca/CEPA Registry/default.cfm .
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Response:

As noted in EA Section 8.1.5.4 Analysis, Mitigation and Residual Effects Prediction under Operation and Maintenance, the release of a substance added to the Schedule 1 of CEPA (1999) – List of Toxic Substances involves the development of a pollution prevention plan and possibly an environmental emergency plan notice. It is noted that applicable substances (e.g., LNG and chlorination) identified for use during the Project will be acquired, stored, handled and disposed of in accordance with applicable regulatory instruments.

According to the Environment Canada *Implementation Guidelines for Part 8 of CEPA 1999, - Environmental Emergency Plans* (updated to March 2004), "...sections 193 to 205 provide various powers to address the prevention of, preparedness for, response to or recovery from environmental emergencies caused by uncontrolled, unplanned or accidental releases of toxic or other hazardous substances. In investigating various measures to increase the safety and security of Canadians in the event of an environmental emergency, the Government of Canada has identified sections 200 and 199 of Part 8 as important tools. These sections allow the Government of Canada to require environmental emergency plans for toxic or other hazardous substances. The primary objective for requiring environmental emergency planning under sections 200 and 199 is to ensure that appropriate risk management measures are adopted and implemented for potential risks associated with the manufacture, storage and use of toxic and other hazardous substances in Canada.

Section 200 is the regulation-making authority of Part 8, which allows the federal government to establish a list of substances that, if they enter the environment as a result of an environmental emergency: a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity; b) constitute or may constitute a danger to the environment on which human life depends; or c) constitute or may constitute a danger in Canada to human life or health. The Environmental Emergency Regulations contain such a list of substances. Under these Regulations, an environmental emergency plan would be required of any person who owns or has the charge, management or control of any of these substances at or above specified threshold quantities, in containers also exceeding the specified quantities.

Section 199 gives the Minister authority to require the preparation and implementation of environmental emergency plans for substances listed on Schedule 1 of CEPA 1999 (the List of Toxic Substances) or for substances that the Ministers of the Environment and Health have recommended that the Governor in Council add to Schedule 1.”

REFERENCES

Environment Canada 2004. 2004 (September 2003 updated: March 2004) Implementation Guidelines for Part 8 of the Canadian Environmental Protection Act, 1999 – Environmental Emergency Plans Internet Publication: http://www.ec.gc.ca/CEPARegistry/guidelines/impl_guid/toc.cfm.

Comment:

NSEL-EC-01-02	Stephen Zwicker EA Section	Releases of listed toxic substances, and the resultant environmental effects, should be predicted. Project design features, and mitigation and follow-up programs, which are consistent with applicable control instruments, should be identified.
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Response:

All hazardous and toxic substances that could be potentially used at the Terminal and can be identified at this time in the planning process have been identified in EA Section 2.5. Provisions will be provided for collection and containment for all toxic substances. All toxic substances will also be contained and managed such that spills can be contained and disposed of appropriately without any environmental impact. These measures will be specified in plans to be prepared such as the Environment Emergency Plan and Spill Response Plan. Final Project design features and operational measures will include provisions for monitoring, control, mitigation, and follow-up programs for all toxic and hazardous substances.

Comment:

NSEL-EC-01-03	Stephen Zwicker EA Section	New Substances Notification Regulations The proponent should be aware of its responsibilities under the New Substances Notifications Regulations (NSNR). The NSNR stipulate the information that must be submitted to EC prior to the import or manufacture of any new substance in Canada. The sole basis for determining if a substance is new is the Domestic Substances List (DSL), which is a list of approximately 24 000 substances that are presently in Canadian commerce. A 'substance' can include chemicals, polymers, micro-organisms or organisms (this would include genetically modified or non-indigenous animals, bacteria, enzymes, fish, etc., that are new to Canada). For more information on this regulation, please contact Kim Kennedy at (902) 426-8927 or visit www.ec.gc.ca/substances . This website contains the documents Guidelines for the Notification and Testing of New Substances: Chemicals and Polymers and Guidelines for the Notification and Testing of New Substances: Organisms, as well as a searchable DSL.
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Response:

All new substances will be reported per the NSNR requirements. During final engineering design, management plans will be developed to ensure compliance with all NSNR reporting requirements and follow-up programs.

Comment:

NSEL-EC-01-04	Stephen Zwicker EA Section	The proposed use of any new substances and provisions for NSNR compliance should be identified in the EA.
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Response:

Section 2.5 of the EA document outlines the proposed use of any new and hazardous/toxic substances identified to date. All new substances will be reported per the NSNR requirements. During final engineering design, management plans will be developed to ensure compliance with all NSNR reporting requirements and follow-up programs.

Comment:

NSEL-EC-01-05	Stephen Zwicker EA Section	National Pollutant Release Inventory The National Pollutant Release Inventory (NPRI) was established in 1992 to collect data on substances of concern in Canada. This inventory administered by EC is the only legislated, nation-wide, publicly accessible inventory of its type in Canada. Companies which meet certain reporting criteria for certain substances are legally obligated to report annually before June 1st to EC under the provisions of CEPA 1999. The Minister of Environment publishes an annual notice in the Canada Gazette, Part I, describing the reporting criteria and requirements of NPRI. The Canada Gazette Notices can be obtained at: www.ec.gc.ca/pdb/npri/npri_cgaz_e.cfm . For further assistance in determining whether this facility must report to the NPRI, the proponent should contact Mr. Chris Roberts at (902) 426-4482.
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Response:

The proponent acknowledges regulatory requirements of the NPRI and will incorporate the reporting requirements within annual operational reporting programs.

Comment:

NSEL-EC-01-06	Stephen Zwicker EA Section	Releases of substances reported under the NPRI program should be predicted. NPRI reporting requirements should be integrated into a follow-up program designed to verify predictions and the effectiveness of mitigation measures.
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Response:

The proponent will address all reporting requirements in the NPRI program, and is aware of the fact that the list of substances is an evolving one. The applicable substances will depend on certain design

options that may be subject to change during final design. As the EA demonstrates, the Project incorporates design elements – use of waste heat, electrical power from the grid – that will minimize the on-site emissions. As noted in EA Section 8.1.2.5 follow-up and monitoring is proposed to verify predictions and determine the effectiveness of mitigation; consideration of NPRI reporting results could be included in this program.

Comment:

NSEL-EC-01-07	Stephen Zwicker EA Section	Environmental Emergency Regulations The Environmental Emergency (E2) Regulations under Section 200 apply to any person in Canada who owns, or has charge, management or control of, a substance listed on Schedule 1 of the regulations that is present in a quantity equal to or greater than that specified in the Schedule. The proponent should be aware that Liquefied Natural gas (CAS number 8006-14-2) is included on Schedule 1.
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Response:

Comment noted. The proponent is aware of the E2 Regulations and will comply with all applicable requirements.

Comment:

NSEL-EC-01-08	Stephen Zwicker EA Section	The regulations, which came into force on November 18, 2003, identify the information that must be submitted to EC within 90 days after the regulations come into force or within 90 days after acquiring a scheduled substance at or above the specified threshold quantities. An environmental emergency plan will also be required for all facilities that store or use any of the scheduled substances at or above the specified threshold quantities. For more information on the regulations, please contact Mr. Sinc Dewis at (902) 426-6318 and/or visit www.ec.gc.ca/ee-ue .
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Response:

Comment noted. In accordance with the regulations, the proponent will develop applicable plans, including an environmental emergency plan, as required.

Comment:

NSEL-EC-01-09	Stephen Zwicker EA Section	The potential release of substances controlled under the E2 Regulations should be considered in terms of the mandatory requirement to assess the environmental effects of accidents and malfunctions. Ultimately, it is important that project design features, as well as the mitigation and follow-up program, inclusive of related contingency planning, be consistent with the regulations.
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Response:

Comment noted. The proponent will incorporate elements of the E2 Regulations into design plans, mitigation and follow-up programs and contingency planning, as applicable and required.

Comment:

NSEL-EC-01-10	Stephen Zwicker EA Section	Species at Risk Act The proponent and any decision-making authorities should be reminded that the the Species at Risk Act amends the definition of “environmental effect” in subsection 2(1) of the CEAA to clarify, for greater certainty, that EAs must always consider impacts on a listed wildlife species, its critical habitat or the residences of individuals of that species.
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Response:

A discussion of potential Project effects on SARA listed wildlife species and their habitat as well as related mitigation and proposed monitoring and follow up programs are discussed under relevant VEC sections. Text has also been added to Section 1.4 of the EA document to further articulate responsibilities under SARA.

Comment:

NSEL-EC-01-11	Stephen Zwicker EA Section	SARA also requires that the person responsible for a federal EA must, without delay, notify the competent minister(s) in writing if the project being assessed is likely to affect a listed wildlife species or its critical habitat. The person must also identify adverse effects of the project on listed species and their critical habitat. And, if the project is implemented, the person must ensure that measures are taken to avoid or lessen adverse effects and that any effects are monitored. Mitigation measures must be consistent with recovery strategies and action plans for the species.
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Response:

ANEI acknowledges the requirements for notification under SARA. Detailed field surveys were conducted and relevant authorities (*e.g.*, Atlantic Canada Conservation Data Centre), government departments (*e.g.* NSDNR, DFO) and information sources (*e.g.*, NSDNR endangered species biologist) were consulted regarding the evaluation and discovery of candidate species within the Project area and to determine appropriate mitigation strategies.

Comment:

NSEL-EC-01-12	Stephen Zwicker EA Section	Any references in the document to “the federal Endangered Species Act” should be changed to Species at Risk Act (SARA).
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Response:

These references have been changed.

Comment:

NSEL-EC-01-13	Stephen Zwicker EA Section	2.2.1.3 Offshore Facilities-There should be some discussion on the design of these facilities in relation to wind/wave/tide conditions and the influence on interactions between vessels and the wharf.
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Response:

The LNG marine facilities' design and engineering will be completed during detailed engineering. The LNG marine facilities' design and engineering will be based on the most recent geotechnical, seismic, and metocean criteria (wind/wave/tide conditions, *etc.*), all applicable codes and standards, and interactions between the vessels and the wharf will also be evaluated during detailed engineering. Some of the applicable codes include but are not limited to:

- British Standard Code of Practice for Marine Structures – Parts 1-6. BS6349: British Standards Institution.
- Society of International Gas Tankers and Terminal Operators, Ltd (SIGTTO): Site Selection and Design for LNG Ports and Jetties, Information Paper No. 14.
- Oil Companies International Marine Forum (OCIMF): Mooring Equipment Guidelines.
- Oil Companies International Marine Forum (OCIMF) and SIGTTO: Prediction of Wind Loads on Large Liquefied Gas Carriers.
- Oil Companies International Marine Forum (OCIMF): Prediction of Wind and Current Loads on VLCC's (current forces only).
- International Association of Lighthouse Authorities (IALA) Aids to Navigation Guide (Navguide).
- Permanent International Association of Navigation Congresses (PIANC): Approach Channels – A Guide for Design; June, 1997.
- Permanent International Association of Navigation Congresses (PIANC): Supplement to Bulletin 61; “Underkeel Clearance for Large Ships in Maritime Fairways With Hard Bottom”; 1985.
- Building Code Requirement for Structural Concrete, ACI318-02; American Concrete Institute (ACI).
- Manual of Steel Construction, Load and Resistance Factor Design; American Institute of Steel Construction (AISC); 3rd Edition, Jan. 2003.

- Guidelines for the Safe Design of Commercial Shipping Channels, Published by the Waterways Development Division, Canadian Coast Guard (December 2001)
- LNG Operations in Port Areas: Recommendations for the Management of Operational Risk Attaching to Liquefied Gas Tanker and Terminal Operations in Port Areas, Society of International Gas Tankers and Terminal Operators (SIGTTO), 2003.

Comment:

NSEL-EC-01-14	Stephen Zwicker EA Section	If this analysis will form part of the TERMPOL review, this should be noted. In fact, the relevance of TERMPOL information needs and evaluation criteria to the whole of the EA, and the selected VECs, should be made more explicit. EC is supportive of the TERMPOL process, and indeed, is prepared to participate if requested. Both processes rely on a consideration of many common factors and they should be undertaken in a mutually supportive manner. The manner in which the two processes will inform each other should be clarified accordingly.
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Response:

The TERMPOL process itself is not a regulatory instrument, but under *CEAA*, there is a requirement for review of the environmental effects of projects with marine/navigation safety issues. To serve this purpose, Transport Canada is mandated to be part of the technical review committee. Transport Canada uses the TERMPOL process as the tool to objectively appraise operational ship safety, route safety, management and environmental concerns associated with the location, construction and subsequent operation of a marine terminal system for the bulk handling of LNG (and other cargoes identified by Transport Canada). Such an appraisal, using the procedures and methodologies described in the TERMPOL review process, enables an inter-departmental committee to identify potential problems and to recommend appropriate mitigative measures. Initially, Transport Canada was identified as possessing expertise in marine safety, navigation and related matters, and has provided input to the process of finalizing the EA. It is further anticipated that Transport Canada will now have direct responsibilities under *CEAA* with the recent transfer of *NWPA* administrative to Transport Canada.

There is considerable overlap in information required for the TERMPOL review process and the EA review process. As a result of this overlap, a proponent may opt to satisfy TERMPOL requirements as part of the *CEAA* technical review committee. A separate review by the TERMPOL review committee may also be undertaken. For this particular Project, the proponent has decided to satisfy TERMPOL requirements in a review separate from the EA process. Transport Canada has agreed that the full requirements of the TERMPOL guidelines applicable to ANEI could be satisfied after the completion of the EA process in a “stand-alone” TERMPOL report. This report will include relevant information from the EA document, supplemented with additional information as required. The TERMPOL process is required to be completed prior to operation of the facility. All information needed to complete the

environmental assessment of the Project, for *CEAA* purposes, including input from Transport Canada (and CCG) has been included in this EA submission.

Comment:

NSEL-EC-01-15	Stephen Zwicker EA Section	2.2.2 Commissioning-There is discussion in this section and several others in the document (Table 2.1, page 2-15 and pages 2-4 – 2-5, etc.) on the merits of using approximately 6 500 tonnes of natural gas components or liquid nitrogen during the cool-down operation. These discussions include the relative costs of using nitrogen vs. LNG for cool-down and conclude that: a) in most situations, especially for storage tanks associated with liquefaction plants, LNG is employed as the cool-down media; b) the nitrogen cool-down is more expensive; and, c) the selection of cool-down method will be determined during detailed engineering based on further discussion with the tank vendors (page 2-5). What does not appear to have been factored into these discussions is that the use of LNG for cool-down has climate-change implications, whereas nitrogen would have negligible atmospheric impacts. Therefore, from a climate-change perspective, the use of nitrogen for the cool-down operation is the preferred option and this should be a factor to be included in the decision on this aspect of the facility's operation.
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Response:

The greenhouse gas contribution of the vent gas (*i.e.* using LNG for cool down) is acknowledged in the third paragraph of Section 8.1.2.4 Analysis, Mitigation and Residual Environmental Effects Prediction under Construction. Unfortunately, the units were transcribed incorrectly in this section. The release is 6,500 metric tonnes of methane, 137 ktonne of carbon dioxide equivalent. This correction has been made in the EA text. The climate change implications are a major factor in the cool- down method decision.

Comment:

NSEL-EC-01-16	Stephen Zwicker EA Section	2.4.1 Air Emissions – Generation and Management of Greenhouse Gases-While it is commendable that the proponent is considering the use of waste heat generated by the Point Tupper Generating Station for use in gas vapourization, there is no indication of how much greenhouse gas (GHG) will be produced by the project in total. CO2 equivalent gases will be produced in both the construction and operational phases of the project through the combustion of gas as well as the consumption of electricity (the latter either from onsite power generation or use of electricity from the existing grid). The facility will contribute to climate change processes. Globally, the cumulative effects of many individually small GHG-emitting activities has resulted in about a 30% increase in the atmospheric concentration of carbon dioxide over the past 150 years, which is significant.
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Response:

Section 8.1.2.4 of the EA document contains details on the greenhouse gas emissions. The electrical load of the plant has subsequently been estimated to be approximately 25 MW. The Nova Scotia generating mix produces emissions of 780 kg/MWhr (1999 data, Canadian Association of Petroleum Producers, Voluntary Challenge Guide, CAPP Publ. #2000-0004). The annual emission by Nova Scotia Power to generate 25 MW of electricity is estimated at 171 ktonne CO_{2e}.

REFERENCES:

Canadian Association of Petroleum Producers (CAPP). 2000. Voluntary Challenge Guide. CAPP Publ. #2000-0004

Comment:

NSEL-EC-01-17	Stephen Zwicker EA Section	In order to adequately assess the GHG footprint of the project, the EA document should include an emission breakdown for each of the scenarios proposed (i.e. vaporization from heat derived from cooling water from Point Tupper; sea water combined with direct gas heaters; direct fired heaters). Breakdowns for other emission sources also need to be included. With this information, the EA document should be able to demonstrate that the best available technologies have been evaluated and that the chosen technology minimizes GHG gas production to the maximum extent possible given all other environmental and economic considerations. EC certainly encourages the proponent to pursue the use of waste heat from the Point Tupper facility (this could also improve the efficiency of the coal-fired station) or the heat from sea-water option.
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Response:

Section 8.1.2.4 of the EA and the responses to NSEL-EC-01-15 and NSEL-EC-01-16 provide additional information on the greenhouse gas emissions from the Project. The differences between the waste heat and dedicated heater alternatives is calculated in Section 8.1.2.4.

Comment:

NSEL-EC-01-18	Stephen Zwicker EA Section	The proponent should also be aware that it will be probably classified as a Large Final Emitter and be required to report annually on its emissions as well as being subject to a carbon credit system. The proponent is encouraged to establish a reporting and monitoring system now and make allowances to incorporate new technologies as the project progresses in its operational phase. This should be reflected in the revised EA document.
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Response:

The proponent will monitor emissions, and will continue to review new technologies that will improve efficiency and profitability. The proponent will comply with all regulatory reporting requirements.

Comment:

NSEL-EC-01-19	Stephen Zwicker EA Section	In terms of specific measures to both minimize GHG production as well as maintain air quality during the construction phase, it is reasonable to expect a machine and equipment idling policy will be implemented. Information is available from Natural Resources Canada to help identify opportunities to reduce idling by machine and heavy equipment operators at the following web site: http://oe.nrcan.gc.ca/idling/tool_kit/artwork_airFreshners.cfm?PrintView=N&Text=N .
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Response:

All contractors will be encouraged to maintain equipment to specifications and to implement idling policies. The contractor requirements will be specified in the Project EPP.

Comment:

NSEL-EC-01-20	Stephen Zwicker EA Section	Contractors could also explore using a biodiesel blend which is available in Nova Scotia for equipment use.
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Response:

The proponent will review the practicality of specifying alternative fuels for construction contracting.

Comment:

NSEL-EC-01-21	Stephen Zwicker EA Section	Based on the information in the draft EA document, it appears that there are several activities that make use of the gas available to power various components of the operation. It would be worthwhile determining if there are any that could potentially be a heat source to augment the gas vaporization heating requirements.
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Response:

All machinery in the plant is motor-driven, except emergency generator and firewater pumps some of which are powered by diesel engines. The waste heat from these diesel units is intermittent and negligible. The major usage of fuel gas is by the fired furnace, which is already designed to recover the maximum amount of combustion heat. Very small amounts of fuel gas will be consumed by pilot fires in furnaces and flare. The waste heat from these units cannot be recovered economically by current technology acceptable in industry.

Comment:

NSEL-EC-01-22	Stephen Zwicker EA Section	There should be an assessment of electrical requirements of the facility and from that the amount of GHG that will be produced from operations. If it is not feasible to use waste heat from Point Tupper, it may be useful to determine if a gas-fired generating system could be constructed from which electricity could be sold to NSPI and waste heat used to vaporize the LNG and other possible spin-off activities.
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Response:

As noted with response to NSEL-EC-01-06, the electrical load is, on average, 25 MW. If the proponent were to build a gas-fired generation system, it would reasonably be expected to use the waste heat from that system, reducing the waste heat use from Point Tupper. Such an undertaking is not currently planned. The proponent has weighed a number of alternatives and believes that the proposed undertaking is optimized with regard to energy consumption.

Comment:

NSEL-EC-01-23	Stephen Zwicker EA Section	Table 2.1 Routine Project Emissions/Effluents-It is stated that generator, engine and utilities exhaust emissions of CO ₂ , NO _x , SO ₂ , and TSP during construction “will comply with the NS Air Quality Regulations and Ambient Air Quality Objectives”. The EA document should present an inventory of expected emissions from these sources to support the statement that the level of emissions will not cause an exceedance of the Regulations and Objectives. In EC’s experience with EAs of other LNG facilities, and indeed any project of this size, full emission inventories from all known sources, during all project phases, have been provided.
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Response:

Until completion of detailed engineering, and final selection of alternatives it would be speculation as to the numbers of trucks, compressors, and portable generators on-site. The density of equipment on-site will not exceed that of any construction project routinely permitted in Nova Scotia. In the jurisdictions to which the reviewer refers, the regulators have provided guidelines that mandate a different level of detail, and which, notably, ignore the greenhouse gas implications considered here. Estimated emissions inventories for all major sources and parameters (including GHG), have been provided in the EA.

Comment:

NSEL-EC-01-24	Stephen Zwicker EA Section	Also, in the row for cool-down operation/one-time release of natural gas components or liquid nitrogen, the proponent claims that atmospheric emissions will comply with the NS Air Quality Regulations and National Ambient Air Quality Objectives under CEPA. There are no emission regulations in Nova Scotia for the release of natural gas components and there are no Maximum Permissible Ground Level Concentrations nor National Ambient Air Quality Objectives for natural gas components.
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Response:

It is agreed that these standards don't specifically apply to the release of the natural gas.

Comment:

NSEL-EC-01-25	Stephen Zwicker EA Section	2.2.3.8 Vent/Flare System-It should be determined whether it would be feasible to recover heat from the flare pilots (150,000 btu/hr each), as well as the flare header (2,500,000 btu/hr).
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Response:

Very small amounts of fuel gas will be consumed by pilot fires in the flare. The waste heat from these units cannot be recovered economically by current technology acceptable in industry.

Comment:

NSEL-EC-01-26	Stephen Zwicker EA Section	The information in the second paragraph of p. 2-12 is unclear. It should be possible to quantify total gas consumption/hour as well as GHG production. The proponent should in turn explore methods to recover heat from these continuous emitting point sources to reduce GHG footprint, since flaring, based on the data provided, would produce 1,687.5 tonnes GHG/year.
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Response:

The total gas consumption has been determined for the flare pilot and sweep gas based on the heat duty and is noted in paragraph two of Section 2.2.3.8 Vent/Flare System of the EA document. As the heat duty for the pilot and sweep gas is very small it is not economically feasible using current technology to recover at waste heat from the flare.

Comment:

NSEL-EC-01-27	Stephen Zwicker EA Section	2.2.4 Decommissioning-Decommissioning planning should be targeted at assuring desired environmental goals for the area are respected and achieved. The following factors would support such a planning effort: Reviewing baseline information and follow-up monitoring program data on a regular basis; Thorough record-keeping; Meeting applicable environmental quality guidelines and standards throughout the operational life of the facility; Documenting other activities near the site to identify other potential influences; Incorporating progressive rehabilitation within the facility boundaries where possible
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Response:

Decommissioning planning will be undertaken to ensure environmental goals for the area are met. Activities that may support such planning include: a review of baseline and follow up monitoring program data; thorough record keeping; adherence to applicable environmental guidelines and standards during operational phases; documentation of activities near the site with potential influencing influences; and incorporation of progressive rehabilitation within the facility boundaries where possible. Decommissioning plans will be developed in consultation with the relevant regulatory authorities well in advance of decommissioning activities. Any changes in regulatory approvals pursuant to decommissioning will be obtained.

Comment:

NSEL-EC-01-28	Stephen Zwicker EA Section	In recent environmental reviews of LNG facilities in the United States, proponents have provided review agencies with the data and assumptions that were used in reaching conclusions in relation to the risk and impacts of malfunctions and accidents. Also, in the two most recent EA reviews of proposed LNG facilities in Canada, EC has been provided with this more detailed information and has consulted directly with the proponents. As a next step in this review, EC is requesting a similar commitment be made by the proponent. Indeed, this topic was discussed during the July 30, 2003 meeting on the project description and it was understood by EC that the proponent was prepared to honour this request. Provision of this more detailed information in advance of such a discussion with the proponent would be helpful. EC will respect the confidential nature of this data and it is recommended that the proponent contact the department to make suitable arrangements.
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Response:

Data has been sent to Environment Canada and discussions have been scheduled to address this comment.

Comment:

NSEL-EC-01-29	Stephen Zwicker EA Section	Also, it is recognized by EC and authorities in other jurisdictions that there is very limited “real world” experience regarding the behaviour and potential impacts of a release of LNG in the marine environment in particular. There is however, a known body of work on this issue that is beginning to emerge in North America. Notably, as part of a multi-agency agreement, the Federal Energy Regulatory Commission (FERC), in cooperation with the Department of Transportation’s Research and Special Programs Administration (RSPA) and United States Coast Guard (USCG), is conducting a study to evaluate the hazards associated with LNG spills on water for the purpose of developing a model for calculating vapour and thermal hazards associated with such spills. The results of the study are due at the end of March 2004. Other organizations, such as the National Institute of Standards and Technology (NIST), have been asked to conduct research into spreading of LNG on water.
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Response:

The proponent agrees that significant work has and continues to be undertaken to enhance understanding of LNG behaviour when released into the marine environment. The proponent will consider a Register of Major Hazards and Key Issues for tracking developments and/or changes in the state of knowledge in this regard.

Comment:

NSEL-EC-01-30	Stephen Zwicker EA Section	This work may be undertaken in the near future. Similar research initiatives may be underway in academic centres including the Massachusetts Institute of Technology (MIT). The EA document should reflect a commitment to track this and other emerging information in consultation with appropriate government agencies in order to ensure appropriate facility management and response procedures are in place.
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Response:

Please refer to the response to NSDEL-EC-01-29.

Comment:

NSEL-EC-01-31	Stephen Zwicker EA Section	8.1.2 Air Quality-In Table 8.3, p. 8-16 (Residual Environmental Effects Assessment Matrix: Air Quality), cool-down using “liquid nitrogen if found feasible” is listed with an assessment of the significance criteria for environmental effects (low magnitude, small geographic extent, short duration, reversible, etc). However, use of natural gas components for cool-down is not listed in this table. Since it is discussed as an option in earlier parts of the document, it should be evaluated in this table using the same criteria – especially since the discussion earlier in the document appears to present this as the preferred option, at least cost-wise.
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Response:

The comment is noted. The quantity (*i.e.* magnitude) of methane on a large geographic scale, and contribution to global climate change is very small; however, the impacts, by definition, are geographically large, of long duration, but reversible on an undetermined time scale. Table 8.3 has been revised, accordingly, showing the impact of the two cool-down options. Also, please refer to the response to NSEL-EC-01-15.

Comment:

NSEL-EC-01-32	Stephen Zwicker EA Section	Page 8-11, last paragraph: It is stated that “Emissions of the major sources (e.g. ships) are of short-term nature, relatively low frequency, and with potential impacts in the order of several hundred metres.” As noted earlier, these (and indeed all) emission sources need to be identified and quantified in order to support such conclusions.
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Response:

The impacts of all major sources including LNG ships at berth, are predicted using dispersion modelling in Section 8.1.24 under Operation and Maintenance on page 8-13. As noted in the response to NSEL-EC-01-23, the incremental impact of mobile sources such as construction equipment and vehicle movements is minor and transient, and typifies many routine construction projects in Nova Scotia. The addition of two to three LNG ships a week to the Strait of Canso represents an increase of 1.8 to 13.4 % of ship traffic in the Strait. This minor increment and resulting air emissions are anticipated to fall well within acceptable levels as defined in the EA air quality criteria. The combined emissions of all vehicles and activities would be significantly less than, for example, the container terminals in Halifax. It is understood that these highly detailed inventories of incidental and mobile sources is undertaken in jurisdictions with much more heavily impacted airsheds.

Comment:

NSEL-EC-01-33	Stephen Zwicker EA Section	8.1.8 Wetlands-Without having undertaken the recommended survey work on Wetland 6, the conclusion that there are not likely to be significant impacts on this wetland can not be supported.
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Response:

Text has been added to paragraph two of Section 8.1.8.6 to address this comment.

Comment:

NSEL-EC-01-34	Stephen Zwicker EA Section	Based on the information presented, it appears that two wetlands will be partially infilled and another two will be partially affected by security fence installation. It is not clear whether any coastal wetlands could also be affected by the proposed project. As part of its commitment to wetland conservation, the Federal Government has adopted the Federal Policy on Wetland Conservation with its objective to “promote the conservation of Canada’s wetlands to sustain their ecological and socio-economic functions now and in the future”. EC recommends that the goals of the policy be used to guide project planning and activities as they relate to impacts on wetlands.
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Response:

The goals of the Federal Policy on Wetland Conservation have been applied in Project planning and activities as they relate to impacts on wetlands. Wetlands are a valued ecosystem component addressed substantially in the environmental assessment (Sections 6.1.9.1 and 8.1.8)and wetland evaluations have been completed to assess the functional attributes of the wetlands found in the study area (Appendix G). The presence of wetlands has been taken into consideration in the design of the facility and significant efforts were made to locate the facility in order to minimize impacts on wetlands. It has not been possible to avoid all wetlands in the study area for several reasons. The location and configuration of the facility are constrained by zoning, safety and engineering factors. The current configuration

minimizes the overall effect of the facility on all valued ecosystem components including wetlands. Unfortunately, it is not possible (or practical in this case) to eliminate all adverse effects on wetlands without having more severe adverse effects on other valued ecosystem components, (e.g., watercourses) or creating significant technical impediments.

Comment:

NSEL-EC-01-35	Stephen Zwicker EA Section	8.1.11 Birds-In Appendix H, Table 1, “Northern Parula Warbler” should be changed to “Northern Parula”.
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Response:

Northern Parula Warbler has been changed to Northern Parula in Appendix H, Table 1 in the EA document.

Comment:

NSEL-EC-01-36	Stephen Zwicker EA Section	It should be confirmed that biologists from the provincial Department of Natural Resources have been consulted regarding wetlands and wildlife (as broadly defined in A Wildlife Policy for Canada).
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Response:

NSDNR biologists were consulted by the Jacques Whitford biologist regarding wetland and fauna and flora evaluations conducted for the Project.

Comment:

NSEL-EC-01-37	Stephen Zwicker EA Section	8.1.11.2 Residual Environmental Effects Evaluation Criteria-The definition of a significant effect should be revised in this section. The loss of a single endangered bird directly related to project activities could be considered significant.
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Response:

If a bird population is affected to the extent that a decline and/or a change in distribution beyond which natural recruitment would not re-establish the population to its former level within several generations, then by definition, the effect is significant. If this level of effect is achieved by the loss of a single endangered bird due to Project activities, then the effect would be considered significant. This is inherent in the definition presented in the EA document.

Comment:

NSEL-EC-01-38	Stephen Zwicker EA Section	8.1.11.4 Analysis, Mitigation, and Residual Environmental Effects Prediction-It is indicated on page 8-66 that "It is recommended that clearing be conducted outside the breeding season where feasible in order to avoid destruction of nests and nestlings." The breeding season is described as April to August. It should be noted that the breeding season is not the same for all species of migratory birds in Nova Scotia (i.e. some species of birds do not breed during the April to August period). It is also important to note that ground nesters could nest in previously cleared project areas and thus still be impacted by project-related construction activities even though vegetation clearing has occurred outside their breeding season. It is expected that these considerations will be reflected in project planning and in the revised EA document. Ultimately, it is the proponent's responsibility to comply with the Migratory Birds Convention Act (MBCA) and associated regulations during all project phases.
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Response:

The proponent intends to comply with the *Migratory Birds Convention Act* during all phases of the Project. To this end, we propose a discussion with Environment Canada after the final clearing/grading plan is developed to develop refined, practical mitigation that can be used to minimize the effects of site clearing on species such as Red Crossbill and White-winged Crossbill that nest year round and ground nesters such as White-throated Sparrow, Common Nighthawk and Killdeer. The most effective way to reduce the potential for ground-nesting species to nest on the site would be to grub in winter or early spring. This would eliminate nesting habitat for all protected species except Killdeer; however, it could create added risk for erosion and sedimentation. While ANE will consult with Environment Canada as noted to refine mitigation measures, the existing mitigative measures described in the EA are expected to prevent any significant adverse effects on birds evaluated as a VEC.

Comment:

NSEL-EC-01-39	Stephen Zwicker EA Section	The statement regarding which species of birds are protected under the MBCA is not quite correct and should be reworded. Also, the word "intentional" should be removed from the 5th line of the last paragraph of page 8-66.
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Response:

The sentence regarding birds protected under the *MBCA* in Section 8.1.11.1 under Administrative Boundaries, has been reworded, and the word "intentional" has been removed from paragraph two of Section 8.1.11.4 under Construction.

Comment:

NSEL-EC-01-40	Stephen Zwicker EA Section	It is later indicated in this same section that "Clearing and grubbing outside the breeding season will deny birds habitat; however, birds have the option of establishing nests in adjacent areas." This statement makes the assumption that suitable areas nearby are not already occupied. If their habitat is destroyed, birds have no choice but to either seek breeding habitat elsewhere or become non-breeders. Only a certain concentration of individuals can be supported in any given area of habitat. However, adjacent areas, if they are considered good similar breeding habitat, are likely already to be fully occupied by other individuals of the same species. Therefore, most of the displaced birds will likely not breed.
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Response:

The wording from paragraph two of Section 8.1.11.4 under Construction has been altered and text has been added to address this comment.

Comment:

NSEL-EC-01-41	Stephen Zwicker EA Section	This section on habitat fragmentation should be rewritten to better reflect the impacts to birds.
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Response:

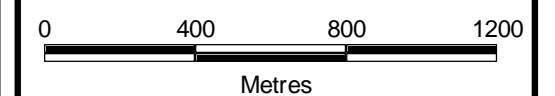
Clearing of the Project footprint will result in the creation of clearings that will contribute to habitat fragmentation in the area. Habitat fragmentation can adversely affect bird populations in several ways. Habitat fragmentation increases the amount of edge habitat potentially increasing rates of predation and nest parasitism and exclusion of forest interior species such as Ovenbirds. Habitat fragmentation can also limit bird distribution and the availability of suitable habitat by creating barriers to bird movement. The Canadian Wildlife Service (2004) has found that forest songbirds are reluctant to cross gaps greater than 200 m wide. In areas where large gaps are numerous, birds may not be able to reach patches of suitable habitat. Habitat corridors linking patches of suitable habitat must be wide enough to overcome the effects of habitat edge so that forest interior species are able to fully utilize the corridor. A corridor width of at least 900 m is desirable to ensure the long-term viability of forest corridors.

Clearing for the Project facility will result in the creation of a square clearing approximately 350 m wide. A clearing this size can be expected to affect bird movement patterns since many songbirds will be reluctant to cross it. Seven other clearings greater than 200 m across are present, to the north, south, east and west of the proposed LNG facility (Figure A, Appendix A). The area between these large gaps is characterized by the presence of relatively contiguous closed canopy forest ranging in age from approximately 20 to 80 years. Small gaps less than 200 m across are present in this forest matrix and are associated with wetlands and woods roads. It is assumed that the large gaps will alter bird movement patterns and affect bird usage of adjacent habitat to a distance of 400 m from the edge of the gap (edge effect). Figure A presents the areas potentially adversely affected by habitat edge. In this model it is

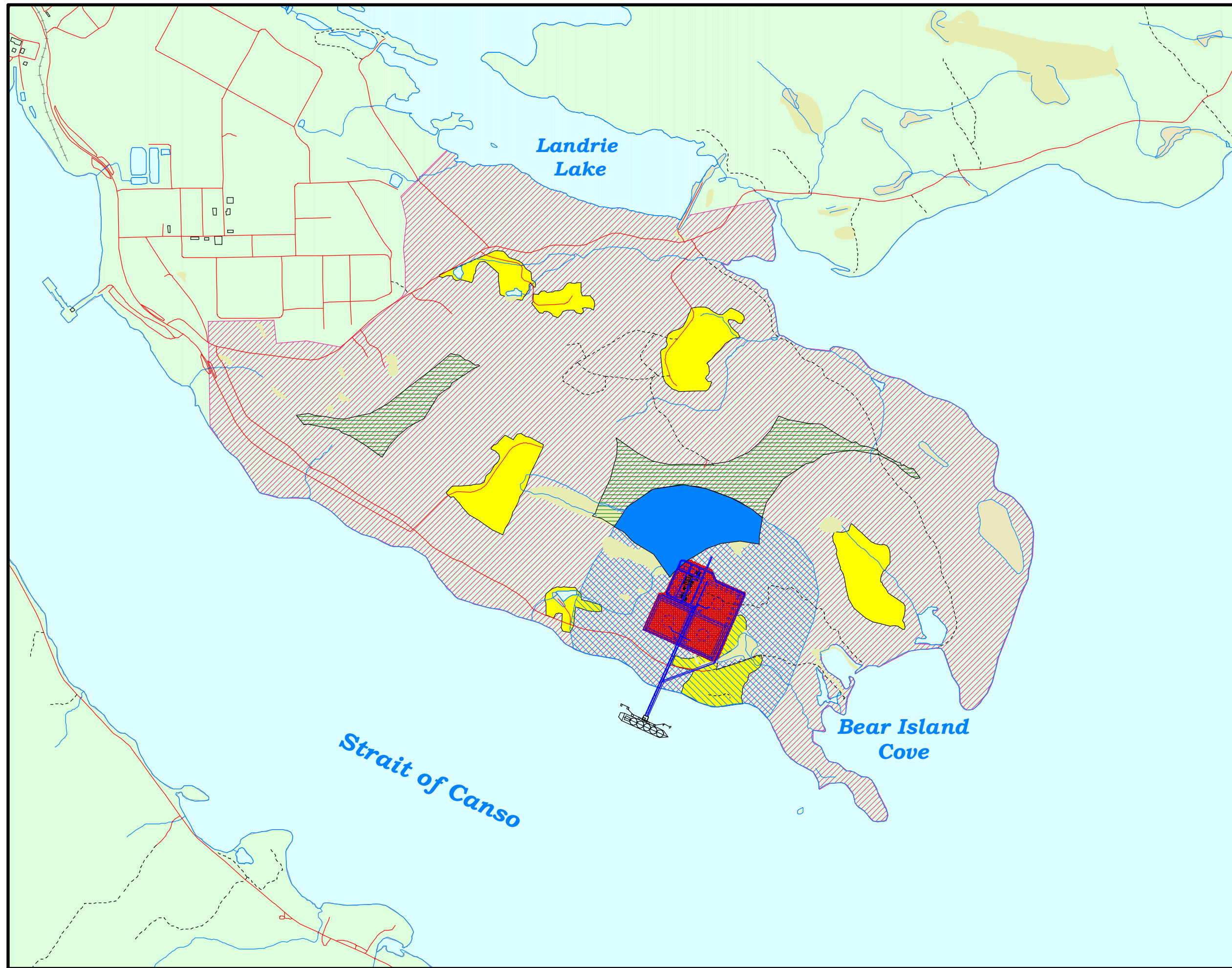
Figure A
Edge Effect and Habitat Fragmentation in the Study Area

Legend

-  Buildings
-  Site Boundary
-  Rivers & Streams
-  Roads
-  Existing gaps
-  Gap associated with LNG Terminal
-  Forest Interior Habitat
-  Area of overlap between existing edge effect and edge effect attributable to the LNG terminal.
-  Edge affected area (within study area) attributable to existing gaps and edges including shoreline.
-  New Edge affected area Attributable to LNG Terminal



Map Parameters
 Projection: Universal Transverse Mercator (UTM)
 Datum: NAD83
 Zone: 20
 Scale: 1 : 20,000
 Project Number: NSD17393
 Date: May 2, 2004



assumed that seashore and lake shore habitats constitute edge habitat and will affect bird usage in the same manner as anthropogenic edges. There are two small areas of forest interior habitat approximately 67 ha in size situated in the central portion of the peninsula. Project construction will result in the conversion of 23 ha (34 %) of this forest interior habitat to edge affected habitat. This area of forest interior habitat to the east remains contiguous and the presence of the Project does not result in the loss of the forest corridor although the existing forest corridor is unconnected to other forest habitats due to the presence of existing industrial facilities at Port Hawkesbury.

The best way to minimize the effects of habitat fragmentation and edge effect is to construct the facility on an existing disturbed site. Given the environmental, zoning and engineering constraints in the study area, this is not possible. The second best approach is to construct adjacent to an existing clearing or edge in order to reduce the amount of area affected by the presence of the new edge. In this instance, the Project clearing is positioned within the overlapping edge effects of three existing gaps. As a result, the amount of area affected by edge effect is reduced from a maximum of 141 ha (if no edges were present within 800 m of the Project) to 23 ha (16%).

Habitat fragmentation and edge effects associated with construction of the LNG terminal can be expected to result in reduced abundance of forest interior bird species and elevated levels of predation, which will result in an overall reduction in bird abundance and breeding success. JWEL (1998) investigated the effects of bridge construction activity on forest birds in similar habitat in New Brunswick. They noted a reduction in bird abundance in plots located adjacent to habitat edges that ranged from 13% to 37%. Bird density in mature softwood dominated stands (similar to that found in the study area) ranges from 250 to 800 pairs per km² (Erskine 1977). The area affected by edge effect associated with construction of the Project is 0.2 km². Based on these data, bird abundance in the area affected by edge effects generated by the Project would be reduced by an estimated 7 to 59 pairs. The effect on regional and local bird populations is not considered to be significant and would be similar to that associated with the clearing of a moderately sized clear-cut or agricultural field.

Text has also been modified in Section 8.1.11.4 after paragraph five under Construction to address this comment.

REFERENCES:

CWS. 2004. Forest Corridor Validation Standards. Internet Publication:
http://www.qc.ec.gc.ca/faune/corridors_verts/html/criteres_validation_e.html . Accessed April 28, 2004

Erskine, A.J. 1977. Birds in Boreal Canada. Canadian Wildlife Service Report Series Number 41.

JWEL. 1998. Northumberland Strait Crossing Project Terrestrial Environmental Effects Monitoring Program: 1997 Results. Prepared for Northumberland Strait Crossing Inc.

Comment:

NSEL-EC-01-42	Stephen Zwicker EA Section	Lighting-The document discusses the placement and direction of lighting. The proponent should include routine monitoring for bird mortalities to confirm the effectiveness of this mitigation. In the event that bird mortalities are occurring as a result of attraction to or disorientation from lighting, the proponent should consult with the Canadian Wildlife Service of EC to discuss other options.
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Response:

Text has been inserted under paragraph two of Section 8.1.11.5 Follow up and Monitoring and in Section 9 Table 9.1 to address this comment.

Comment:

NSEL-EC-01-43	Stephen Zwicker EA Section	It is not clear whether the flare will be continuous or operating only under certain circumstances. This should be confirmed and it is very important that the potential effects of a flare on birds, including migrants during different meteorological conditions (including fog, low cloud ceiling, rain), be evaluated.
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Response:

The flare is designed for emergency use only during upset conditions. Only the flare pilots will be operating continuously. Thermocouples will be installed to detect heat to monitor the pilot operations. As the pilots' flames are not visible, effects from the flare pilots on migrating birds are not anticipated. Additional text has been inserted in Section 8.1.11.4 Analysis, Mitigation and Residual Environmental Effects Prediction under paragraph seven of Operation and Maintenance to address this comment.

Comment:

NSEL-EC-01-44	Stephen Zwicker EA Section	8.1.11.5 Follow-up and Monitoring-The document states that "In the event of a sizeable spill of oils, it is anticipated that the spill response plan (refer to Section 8.3) will include oiled bird monitoring and recovery." There is, however, no explicit recognition of this in Section 8.3. In addition to the usual elements that would be expected to be included in any discussion on contingency planning and spill response (e.g. equipment, procedures, responsibilities) the following issues specific to birds should be addressed: identification of a strategy to deal with accidents where birds were oiled and/or sensitive habitat was contaminated - actions to be taken if birds are oiled (i.e. would the company do nothing, capture and kill the birds, or capture and clean the birds)
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Response:

The text in Section 8.1.11.5 has been modified.

It should be noted that the proposed LNG terminal is not an oil handling facility. Specific requirements for regional spills response planning will be determined through the TERMPOL process and subsequent discussions with applicable regulators. The proponent will comply with all requirements including any specific requirements to respond to bird oilings.

Comment:

NSEL-EC-01-45	Stephen Zwicker EA Section	Considering that waterfowl are known to migrate across the Strait of Canso, several seabird colonies occur in the vicinity, and seabirds are known to occur offshore, these issues should be addressed in the EA document. It is also important that the proponent be aware that even a small spill that impacts species at risk, sensitive habitats, or large numbers of birds could be significant.
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Response:

Given that waterfowl are known to migrate across the Strait of Canso, several seabird colonies occur in the vicinity, and seabirds are known to occur offshore, oiling of seabirds due to accidental events is a concern related to Project shipping activities. This is discussed in paragraph two of Section 8.3.4 Effects of Oil Spills on Marine VECs/VSCs. It is noted that even a small spill that impacts species at risk, sensitive habitats, or large numbers of birds could be significant.

Small amounts of oil on the plumage of a seabird can cause death or decrease reproductive success (Peakall *et al.* 1987; Butler *et al.* 1988). In the offshore industry, routine discharges, such as produced water and deck drainage, or small chronic spills that may contain oil, have the potential to oil birds as hydrocarbon sheens are often noted around platforms. These types of discharges are not anticipated from this Project as ship emissions will be managed, as discussed in Section 8.1.5.4 Analysis, Mitigation and Residual Environmental Effects Prediction under Operation and Maintenance, in accordance with Canadian and International Maritime Organization regulatory frameworks for pollution controls including the Oil Pollution Prevention Regulations, MARPOL 73/78. It is therefore unlikely that marine birds will contact enough oil from minor releases to cause direct population effects through mortality or decreased reproductive success.

Accidental events such as collisions resulting in a large release of oil (*i.e.*, 2,000 barrel spill in one day) would pose proportionately larger risk to marine birds than a small spill. However, the probability of such large spills occurring is very low, given the aids to navigation available to ships from Canadian Coast Guard Services as discussed in Section 8.2.2.1 Boundaries under Administrative Boundaries *Canadian Coast Guard*. Some of these services include monitoring traffic entering Canadian waters, relaying of messages between Pilots and Harbour Authorities as well as provision of marine advisories. The Canadian Coast Guard Emergency Preparedness and Response ensures that oil handling facilities, ship and ports are prepared for spills of persistent oils. The potential environmental effects of large oil spills, including mitigative measures are discussed in the EA Section 8.3.4. The use of LNG boil off gas as the primary fuel on LNG carriers reduces the possibility of a massive release of oil (*e.g.*, from a

collision). Emergency response and contingency planning for the Project may include specific measures related to birds such as an oiled bird rescue effort on nearby shorelines.

REFERENCES:

Butler, R.G., A. Harfenist, F.A. Leighton and D.B. Peakall. 1988. Impact of sublethal oil and emulsion exposure on the reproductive success of Leach's storm-petrels: short and long term effects. *J. Appl. Ecol.* 2:125-143.

Peakall, D.B., P.G. Wells and D. Mackay. 1987. A hazard assessment of chemically dispersed oil spills and seabirds. *Mar. Environ. Res.* 22:91-106.

Comment:

NSEL-EC-01-46	Stephen Zwicker EA Section	On p. 8-133 it is stated that "it is assumed that the existing status or condition of each VEC/VSC reflects the influence of other past and current projects and activities occurring within or outside of the Project area." This is a very poor premise for a cumulative effects analysis. In EC's opinion this section needs to be rewritten so that it provides a better understanding of the stresses and impacts of industrial development and resource use in this area. A suggested approach is offered below.
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Response:

In the opinion of the study team, the cumulative influences of past and present anthropogenic actions are best characterized by present baseline conditions. This is particularly true for past and present activities that may be difficult to quantify due to issues such as lack of access to proprietary information related to emissions and discharges from other projects and activities. The methodology used in assessing cumulative effects for this Project follows current practice and is consistent with *CEAA* and informed by the assessment framework presented in the Cumulative Effects Assessment Practitioner's Guide (CEA Agency 1999).

REFERENCES:

Canadian Environmental Assessment Agency (CEA Agency). 1999. Cumulative Effects Assessment Practitioners Guide. Prepared by Canadian Environmental Assessment Working Group and AXYS Environmental Consulting Ltd.

Comment:

NSEL-EC-01-47	Stephen Zwicker EA Section	In Sections 8.4.7 (p. 8-139) and 9.2 (p. 9.6), there is reference to the regulatory requirements of other projects reducing the significance of cumulative effects. From EC's perspective, such assumptions require validation especially since in many cases, existing regulatory tools are not equipped to deal with cumulative effects. Also, there is not enough information presented on the other projects identified to demonstrate that cumulative effects were or are being adequately addressed. Indeed, part of the rationale used for not including the pipeline in the scope of this project was that the cumulative effects of the two projects would be closely examined. As such, from EC's perspective this analysis has not been adequately conducted.
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Response:

The rationale used in the cumulative effects assessment is consistent with the Cumulative Effects Practitioner's Guide (1999), which indicates that: "If direct project effects cause no detectable change in a VEC, then the effects would usually be considered insignificant. If the change caused by the effect is detectable but within the magnitude of naturally fluctuating conditions, then the effects would also usually be considered insignificant." The text in the guide goes on to caution the EA practitioner that "these arguments may not remain true if a number of individual actions each contribute small incremental changes, each below natural variability, which eventually causes a detectable change and exceedance of natural background conditions". The study team agrees with this statement and acknowledges that compliance with regulations is not the only tool that should be used in predicting cumulative effects. In fact, there are a number of factors used to help predict cumulative effects and those tools have been used for the prediction of cumulative effects for this Project.

A consideration of baseline conditions was conducted to determine effects of past and present projects. An evaluation of the existing environment in the assessment area has indicated that the area is not particularly sensitive to any specific pressures.

Important planning instruments are in place and these include regional planning tools such as the West Richmond Municipal Planning Strategy, West Richmond Development Plan and West Richmond Land Use By-law. Land use planning processes have identified a number of constraints (refer to response for comment NSEL-EC-01-48). Landrie Lake watershed has been identified as a protected area as part of the regional land use plan. All three likely future developments noted in the EA document (*i.e.*, the LNG terminal, the coal terminal, the M&NP Pipeline tie-in) will be subject to these mechanisms which specifically look at regional/cumulative effects. For cumulative effects assessment in general, it is important to note that the area has been deemed acceptable (through land use planning) for a number of heavy industry developments such as those currently being considered.

On-going monitoring and mitigation to reduce Project-specific effects is an important consideration in the cumulative effects prediction process and was factored into this assessment.

As originally stated, regulatory requirements for each specific project (EA and other approval stipulations) as well as monitoring requirements, are the most direct means to reduce the potential for regional cumulative effects; however the regional planning mechanisms have also been considered in evaluating the cumulative effects for this Project.

Comment:

NSEL-EC-01-48	Stephen Zwicker EA Section	Regional Approaches to Cumulative Effects-A recognized challenge of cumulative effects assessment is defining reasonable temporal and spatial boundaries and determining the relative contribution of each stressor on a particular environmental resource. One way of examining this issue and identifying appropriate mitigation is to refer to management plans that may have been prepared for sensitive resources and the planning tools developed by various levels of government, community-based organizations and resource users in a particular region. In this case, part of the rationale for the current form of federal EA (i.e., screening) was the applicability of recognized municipal land use planning strategy, which included public consultation. The EA document should include a discussion of this strategy and its applicability to the cumulative effects analysis.
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Response:

The West Richmond Municipal Planning Strategy and the Land Use By-Law were developed to provide land use regulations which best suit the needs of both industry and residents of the West Richmond Plan area. It is based on the West Richmond Development Plan brought forth in 2000. The plan took into consideration aspects of soils, topography, surface water resources, wetlands, vegetation, rare plants, protected areas, wildlife, rare amphibians, sea birds, waterfowl, colonial nesting birds, breeding birds, heritage resources, population, schools, police and fire service, health care, parks and open spaces, planning and development implications, existing infrastructure and site suitability for different applications. The proposed Project area is consistent with the intended use of the land which is zoned for heavy industry, such as marine terminals. Cumulative effects assessment requires a consideration of likely future Projects, of which there are two in addition to this Project. If the area is zoned for a considerable number of similar heavy industries, it is reasonable to assume that environmental considerations were taken into account in this zoning process and that those effects were considered to be within the limits of acceptable change on a broader cumulative scope. Combined with the predictions of non significant environmental effects from Project construction and operation, as well as with the commitments to meet regulations, the study team is confident in its predictions regarding cumulative effects.

Comment:

NSEL-EC-01-49	Stephen Zwicker EA Section	Another example of a regional-based initiative identified in the EA document is related to air quality. In Section 8.1.2.5 it is indicated that the provincial government has identified the Industrial Strait region as one where a regional airshed management approach will be taken.
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Response:

Comment noted.

Comment:

NSEL-EC-01-50	Stephen Zwicker EA Section	On this basis, the EIS document should more fully describe the method used to conduct the cumulative effects assessment including: identification of regional issues of concern; a comprehensive description of how the VECs were chosen; justification for the spatial and temporal boundaries used; a description of the analysis undertaken, and presentation of the results; a description of how mitigation measures address the cumulative environmental impacts; and, the rationale and methods for determining whether residual cumulative effects are significant.
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Response:

The methodology and scope of the cumulative effects assessment of the Bear Head LNG Terminal are fully described in Section 8.4 of the EA document. The methodology used in assessing cumulative effects for this Project follows current practice and is consistent with *CEAA* and informed by the assessment framework presented in the *Cumulative Effects Practitioner's Guide* (CEA Agency 1999).

The consideration of regional issues and selection of VECs/VSCs for the EA (including cumulative effects assessment) were described in Section 7.0 of the EA document. The VECs/VSCs and temporal/spatial boundaries selected for effects assessment (of direct Project effects) were also considered appropriate and inclusive for the consideration of potential cumulative effects.

Other past, present and likely future projects and activities to be included in the cumulative effects assessment were identified in Section 8.4 of the EA document. Cumulative effects of past and present projects were assessed in the context of the Project impact assessment for the VECs and VSCs in Sections 8.1 and 8.2 of the EA document. Future likely projects were assessed for cumulative interactions in Section 8.4 of the EA document. This analysis included consideration of the cumulative environmental effects, need for and effectiveness of mitigation, and evaluation of the significance of residual cumulative environmental effects.

Comment:

NSEL-EC-01-51	Stephen Zwicker EA Section	In assessing the contribution of the proposed LNG facility to cumulative effects, the proponent should identify linkages to environmental goals applicable to the Industrial Strait region and Chedabucto Bay area. A strategy for mitigating and monitoring cumulative effects could involve working with other stakeholders in promoting and supporting regional-scale management efforts aimed at achieving these goals.
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Response:

In conducting the EA for the Project, the study team considered existing developing regional management approaches. The proponent has made a commitment to participate in the Regional Airshed Management approach. Throughout the consultation process (described in Section 5.0 of the EA document), stakeholders did not identify any other regional initiatives. ANEI will commit to staying in touch with the Point Tupper Industrial Committee in order to stay apprised of, and to the extent possible, be supportive of, any new regional initiatives, or as otherwise advised by government agencies.

Comment:

NSEL-EC-01-52	Stephen Zwicker EA Section	This section should include a discussion of storm surge events. The proponent should be aware that advisory and warning bulletins are issued by EC when there is a potential for or likelihood of coastal flooding events. Such bulletins typically include a meteorological description of the event, information on coastlines most likely to be affected, a discussion of complicating factors such as ocean waves and pack ice, and an assessment of the severity of the event. This service may not help the design of the project, but may at least allow some temporary mitigation to be put in place in the face of a serious flooding event.
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Response:

It is noted that Environment Canada weather advisories will be key during Project operations. A storm surge public warning is issued when a storm surge and/or high waves may result in significant flooding in coastal areas. Storm Surge is included in the Marine Synopsis when tide levels are expected to be 0.6 metres above the normal astronomical high tide. Extreme weather, including extreme waves caused by storms is discussed in the EA document under Section 6.1.6.8 Extreme Winds and Waves and under Section 8.5.1 Extreme Waves, with modelling results for seasonal extreme parameters presented in Figure 11 of Appendix E.

REFERENCES:

Environment Canada. 2003. Special Weather Statements and Weather Warnings for the Atlantic Region. Internet Publication. <http://www.atl.ec.gc.ca/weather/terminology.html>. Last Updated May 2003.

Comment:

NSEL-TC-02-01	Mike Balaban Manager, Compliance and Enforcement	The potential for marine accidents and spill scenarios were required for inclusion in the EIS.
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Response:

Potential for marine accidents and spill scenarios were included in the EA document in the discussions under Sections 8.3 and in the Risk Assessment in Appendix C.

Comment:

NSEL-TC-02-02	Mike Balaban Manager, Compliance and Enforcement	Commitment by proponent to prepare a Marine Terminal Manual outlining the specific procedures to be used to manage marine vessel traffic associated with the Project while approaching the Strait of Canso and at the pier and to ensure all applicable navigation rules and regulations are met. An underkeel survey would also be completed as part of the development of the Marine Terminal Manual and marine safety procedures. The draft of the Marine Terminal Manual would be submitted not later than six months in advance of pier operation.
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Response:

Comment noted. The proponent recognizes the requirement for these and other studies to be completed as part of the TERMPOL review process. Drafts of all required studies in support of the TERMPOL review will be submitted no later than six months in advance of facility operation.

Comment:

NSEL-TC-02-03	Mike Balaban Manager, Compliance and Enforcement	The proponent shall provide design inputs for the pier to Transport Canada Marine Safety during the review of the EIS.
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Response:

The marine facilities are currently in the initial stages of engineering design. Once the facility design criteria are finalized, they will be submitted to Transport Canada Marine Safety for review. Refer to response provided for comment NSEL-EC-01-13.

Comment:

NSEL-TC-02-04	Mike Balaban Manager, Compliance and Enforcement	Establish safety and exclusion zones around the pier based on conclusions of the Risk Assessment prepared by LR. Further consultation would have to occur to determine the exact size of these exclusion zones.
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Response:

The development and implementation of Exclusion/Safety Zones will be reviewed in conjunction with Port Authority, the Atlantic Pilotage Authority, the Cape Breton Pilots, MCTS, Transport Canada Marine Safety and the Proponent. While Canada has no standard or guideline for setting the parameters for these zones, safety and security will require that these be reviewed. Safety of operations both in the port and the approaches will be addressed in the Port Information Book and Terminal Operations Manual, required by TERMPOL. The Port Hawkesbury Harbour Authority has the authority to set safety zones and is required to publish these in the Port Authority’s Practices and Procedures developed under the Canada Marine Act. Any decision made in respect to setting Exclusion/Safety Zones will be implemented and published before the Terminal becomes operational.

The development and setting of Exclusion/Safety zones will take into account the movement of other vessels and the risk of collision, the gaseous plume that would occur as the result of a accidental loss of product, and the safety of the LNG carrier and other vessels in the operating area.

Marine Communications and Traffic Services, “Canso Traffic” will provide information to shipping about the movement and location of LNG Carriers operating in the traffic area. They will also advise shipping of the existence of Exclusion/Safety Zones for LNG Carriers

Comment:

NSEL-TC-02-05	Mike Balaban Manager, Compliance and Enforcement	The Atlantic Pilotage Authority may request that the proponent undertake a simulation exercise for the proposed pier. A simulator of the jetty area would be built using local input (e.g. weather, currents, tides), which would allow the Pilots to physically simulate the navigation of virtual ships to and from the proposed pier. This simulation exercise would help to finalize the marine terminal and navigational procedures. The simulation exercise must be completed in advance of development of the Marine Terminal Manual so that any concerns with the movement of vessels, in and around the proposed pier can be addressed. I would suggest that the simulation exercise must be completed before the issuance of the Navigable Waters Protection Act Approval.
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Response:

The Atlantic Pilotage Authority will be contacted to confirm the need and responsibilities associated with this exercise.

Comment:

NSEL-TC-02-06	Mike Balaban Manager, Compliance and Enforcement	Prior to any LNG shipments being handled at the pier, there are also other elements which would need to be submitted and approved by various federal agencies. A spill response plan to conduct the initial response in the event of an incident at the pier would be required from the proponent.
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Response:

As discussed in Section 4 of the EA document, a Spill Management Plan will be developed for the facility to address small and medium sized spills. Response tools for spills of a larger magnitude will be addressed in operational manuals for example, under the TERMPOL process.

Comment:

NSEL-TC-02-07	Mike Balaban Manager, Compliance and Enforcement	Transport Canada-Marine Safety administers the Termpol Review Process (publication TP743E), which enables an in-depth assessment of shipping, navigation and transshipment aspects of marine terminal systems for the bulk handling of oil, chemicals and liquefied gases. The establishment of effective mitigating action and contingency planning to protect the environment are required. It is noted that the review of the marine transportation components of this EIA will be done in accordance with the standards of the Termpol Review Process.
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Response:

Comment noted. Discussions with Transport Canada have been initiated by the proponent to address the requirements of the TERMPOL process. Substantial aspects of the TERMPOL review process will be satisfied by information developed in this EA (*e.g.*, Navigation safety). Transport Canada has indicated that the remainder of the TERMPOL process can be satisfied as a follow-up to the EA but prior to initiation of terminal operations.

Comment:

NSEL-TC-02-08	Mike Balaban Manager, Compliance and Enforcement	Transport Canada met with Jacques Whitford on April 14 and there was an indication that the proponent intends to formally initiate a TERMPOL Review Process in conjunction and in parallel with EIA Process. The following studies/survey will be requested to complement any other requirements under the EIA: Origin, Destination and Marine Traffic Volume Survey; Fishing Vessels Operations Survey; Route Analysis, Approach Characteristics and Navigability Survey; Special Undeekel Clearance Survey; Transit Time and delay Survey; Casualty Data Survey; Ship Specification; Site Plans and Technical Data; Cargo Transfers and Transshipment Systems; Channel, Manoeuvring and Anchorage Elements; Berth Procedures and provisions; General Risk Analysis and Intended Methods of Reducing Risks; Port Information Book; Terminal Operations Manual; Contingency Planning.
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Response:

Comment noted. See response to comment NSEL-EC-01-14.

Comment:

NSEL-NSEL-02-01	Peter Geddes EA Branch	Registration Related Comments: The draft document was initially checked for minimum requirements under the Environmental Assessment Regulations. An operation schedule for the facility should be included, which describes normal operating hours, planned shutdowns etc.
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Response:

Normal operating hours are 24 hours per day, 365 days per year. This is accomplished with the use of spare equipment and a regular maintenance program. This text has been inserted in paragraph two of Section 2.2.3 of the EA document.

Comment:

NSEL-NSEL-02-02	Peter Geddes EA Branch	The project overview section of the registration document should indicate if there is any sources of public funding involved in the project.
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Response:

This Project is privately funded in its entirety.

Comment:

NSEL-NSEL-02-03	Peter Geddes EA Branch	You are reminded that the proponent is responsible for publishing an environmental assessment notice in two papers, one having local distribution and one having province wide distribution within seven days of registration, Please refer to the Proponent's Guide or contact me for more information on the these public notices. You are also required to place copies of the official Environmental Assessment Registration Document in two public locations in the area of the proposed undertaking. Please advise me of these locations prior to registration.
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Response:

Two newspapers, one local and one provincial, have been identified for placement of the environment assessment notice to be placed within seven days of registration. Placement of the ads and copies of the EA document have been discussed with the Environmental Assessment Branch of NSEL.

Comment:

NSEL-NSEL-02-04	Peter Geddes EA Branch	Electronic copies of the public notice and the registration document including all appendices, drawing and maps must be provided for publication on the Department's website. Please refer to the Information Bulletin on Requirements for Submitting Electronic Copies of Environmental Assessment Documents or contact the EA Branch for details regarding electronic versions.
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Response:

The NSEL website has been consulted, and applicable directives will be followed when submitting digital copies.

Comment:

NSEL-NSEL-02-05	Peter Geddes EA Branch	The proposed undertaking is a Category II Environmental Assessment under the environmental Assessment Fee Schedule. The fee schedule was amended on April 1, 2004. The current fee for category II assessments registered on or after April 1, 2004 is \$8,946. ANEI has already provided a cheque in advance of the project registration based on the old fee of \$8,400. An additional cheque for \$546 will be required at the time of registration to reflect the new fee. This cheque should be made payable to the Minister of Finance.
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Response:

Comment noted and requirements will be met.

Comment:

NSEL-NSEL-02-06	Peter Geddes EA Branch	Please note that we require the signature of a signing officer of the company on the registration document. If someone other than a signing officer signs the document, we require a letter giving that individual signing authority for the company. We will be unable to register the project until all minimum requirements outlined in the regulations are met.
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Response:

Comment noted and requirements will be met.

Comment:

NSEL-NSEL-02-07	Peter Geddes EA Branch	It would be useful to identify/label the main components of the facility on figure 1.1 or on a similar plan.
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Response:

Labels have been added to Figure 1.1 to address this comment.

Comment:

NSEL-NSEL-02-08	Peter Geddes EA Branch	The document indicates that one of two alternatives will be used as a heat source for vaporization of the LNG (NSPI closed loop system or direct seawater intake system). Construction of the closed loop system between NSPI and the proposed facility in particular would significantly increase the project boundaries. Additional details and a plan related to the construction, operation and maintenance of such a system should be provided if this option is still considered an alternative at the project registration stage.
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Response:

Two approximately 1350-1500 mm (54-60 inch) water pipelines will be installed between the Terminal and NSPI to receive and send seawater from each facility. This pipeline will be installed along the road right-of-way to minimize environmental impact. A flow meter will be installed and a monitoring program will be implemented during operation of the facility to detect and mitigate any potential leaks from the pipeline. Engineering design of this pipeline will be completed during the detailed engineering phase.

Comment:

NSEL-NSEL-02-09	Peter Geddes EA Branch	The "opportunity for extraction of natural gas liquids" and the marketing of this material as feedstock is discussed on page 2-1 of the document. Additional detail on how this NGL extraction process would work and how the material would be moved from the site to market should be provided.
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Response:

The NGL extraction process works to remove ethane and heavier hydrocarbons (C2+) from the LNG to help reduce the Btu content and meet natural gas sendout pipeline specification. The LNG from the storage tanks is sent through a demethanizer column which heats the LNG to separate the methane vapours, which are collected from the demethanizer top, and the C2+ liquids, which are collected in the demethanizer bottoms. The demethanizer bottoms (C2+ product) would then be made available at the LNG Terminal facility and could be exported through an approximately 300 mm (12 inch) pipeline that would be built and operated by third parties.

Comment:

NSEL-NSEL-02-10	Peter Geddes EA Branch	The public consultation process implemented by the proponent is well described, however the document does not provide any detail on the concerns or comments raised through the process. This information would be a valuable addition to the document at the registration stage.
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Response:

Please refer to response to NSEL-CEAA-01-07.

Comment:

NSEL-NSEL-03-01	Gerard Chisholm Hazardous Substance Management Specialist	I went through the document and felt it was pretty thorough for a draft document. I don't really have any comments right now-As far as I can see, I think it's a little to early to get right into the technical details at this stage. However, I can see myself being much more involved in the technical side of things if the project makes it beyond the EA stage and into the approval stage.
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Response:

Comment noted.

Comment:

NSEL-NSDNR-01-01	Hugh Gillis Planning & Development Officer	The proponent's examination for species-at risk was thorough within the proposed development area. We know of numerous sites for Northern Commandra (<i>Geocaulon lividum</i>) and do not believe the presence of these plants will be an impediment to the project. The more difficult issue is the mitigation proposed for Southern Twayblade (<i>Listera australis</i>). The proposed buffer of 55 m from the patch to the edge of the area to be clear is insufficient. The proponents have identified a number of factors and have proposed measures to mitigate adverse impacts to this population. These particularly relate to sedimentation and changes to the hydrology. A condition of the project must be a detailed mitigation and monitoring plan to be included in the Project EPP, developed in consultation with the Species-At-Risk Biologist (Mark Elderkin). We believe it is important to maintain a minimum buffer of 100 m on both sides of the watercourse in which this plant is found and around the upstream wetland.
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Response:

The creation of a 100 m wide buffer around the southern twayblade colony may not be practical due to design code and other environmental constraints. The general location and specific configuration of the facility are dictated by design code including minimum set backs from existing dwellings, thermal radiance buffer zones and the requirement for tank diking. Within the industrial park, the specific location of the facility has been optimized to minimize the effects of the Project on the environment. Nine potential locations and configurations were investigated before the current location was chosen. The selected location avoids the southern twayblade and northern commandra populations, and two watercourses. It also has the least impact on wetlands in the area. At this location, the facility directly affects 0.3 ha of wetland habitat and allows the maintenance of wetland functions in the wetlands. Other locations investigated typically resulted in the complete loss or serious infilling of at least one wetland and greater overall wetland habitat loss. The current location is located on the watershed divides for three watersheds which helps to reduce the hydrological effects of the Project on wetlands and streams by reducing the proportion of the watersheds affected by clearing of the facility footprint.

It is recognized that the presence of southern twayblade is a significant environmental constraint. Although it is not listed as an endangered species in Nova Scotia or Canada as a whole, it occurs only rarely in Canada with fewer than 20 records for the country. In Canada, southern twayblade is considered to be extremely rare in Nova Scotia and New Brunswick, and rare in Quebec and Ontario. Although the establishment of a 100 m wide buffer around the southern twayblade population and the upstream wetland might be ideal, the environmental and safety constraints outlined above would not permit relocation of the facility without an increase in the overall environmental effects associated with the Project. The overall configuration of the facility would present technical difficulties regarding

design code compliance, and shifting the facility to the east to make room for the 100 m buffer would result in the complete loss of two wetlands and the headwaters of a stream. It is believed that the current layout combined with mitigation and monitoring programs is sufficient to protect this population. It should be pointed out that the distance from the edge of facility footprint to the southern twayblade population when measured is 67 m rather than 55 m as reported in the draft EA.

The construction activities could potentially affect the southern twayblade population in three main ways: through physical alteration of habitat; deposition of sediment in the wetland where the plants are found; and alteration of the hydrology of the stream that the population is found along. Physical alteration of the habitat is unlikely to occur. The population is located 67 m from the edge of the Project footprint, which will provide enough of a buffer to prevent side lighting or wind throw that could alter the physical character of the habitat. The southern twayblade population at the Halifax International airport is located between 20 and 130 m from the edge of the new taxiway extension with the majority of plants located within 100 m of the taxiway. This population has remained stable since construction of the taxiway extension. In order to minimize the potential for disturbance of the southern twayblade habitat or buffer zone habitat, signage and fencing will be used to deter personnel and equipment from entering the buffer zone. Detailed mitigation will be identified in the Project EPP.

Heavy sedimentation of the wetland in which the southern twayblade population is found could potentially smother the population or alter site drainage or trophic status resulting in reduction or loss of the population. Several mitigative measures will be employed to mitigate erosion and sedimentation. Setbacks of 30 m typically employed to protect watercourses will be maintained along this watercourse and a set back of 60 m from the southern twayblade population will be employed. In addition, a number of onsite erosion and sedimentation control measures will be employed to reduce the potential for site erosion and sedimentation of the stream course. Surface water drainage from the site will be drained away from the stream (*i.e.* to the Strait) or will be added to the stream downstream of the southern twayblade population. The site will be revegetated as soon as possible following construction to stabilize soil on the site. Care will be taken not to introduce invasive non-native species that could displace southern twayblade. Invasion of non-native species in southern twayblade habitat has not been a problem at the Halifax International Airport or at other locations where this species has been found (Hoy 2003).

Alteration of the hydrology of the stream near which the southern twayblade population is found could potentially adversely affect the population in several ways. A large diversion of water away from the stream could result in a lowering of water levels in the wetland adjacent to the stream. Diversion of additional water into the stream as a result of reconfiguration of the watershed divide caused by levelling of the site could increase stream flows and cause flooding of the wetland. The creation of impermeable surfaces could result in large fluctuations in water level caused by rapid drainage of precipitation from the site and reduced infiltration. Additional hydrological investigations have been conducted in response to this concern. The hydrological analysis indicated that the Project footprint covers 3% of the

area of the watershed. As such, no significant alteration of water flow patterns or volume would occur if the water that currently falls in this area were diverted away from the stream or reintroduced downstream of the southern twayblade population. The minor potential changes to the hydrology of the wetland that the southern twayblade population is found in could be completely mitigated (if necessary) by diverting flows from the adjacent watershed into the watershed in which this wetland is found.

In addition, to the mitigative measures described above, follow-up surveys and monitoring will be conducted to ensure that the southern twayblade population is protected and maintained. A follow-up survey is proposed for June 2004. The southern twayblade population was detected during the second rare plant survey conducted in July, 2003. At that time, the plants had completed flowering and were senescing making identification difficult. As such, there is potential that the population may be larger than recorded during the rare plant survey. Suitable habitat in Wetlands 2 and 3 will be searched to determine if there are any outlying populations. This survey will also ensure that the species was correctly identified during the 2003 survey. The number of plants present and their distribution will be recorded. The condition of the plants (*i.e.*, flowering, non-flowering, good condition, poor condition) at each location will be recorded and the habitat at each location will be described. The presence of any non-native invasive species in the area adjacent to the southern twayblade patches will be recorded and their cover estimated. This data will provide the baseline data for a monitoring program that will be conducted on a yearly basis. It is recommended that if possible more than one year of baseline data be collected in order to determine natural year-to-year variations in the population.

REFERENCE:

Hoy, J. 2003. New England Plant Conservation Program *Listera australis* Lindl. Southern Twayblade Conservation and Research Plan for New England. Prepared for the New England Wild Flower Society

Comment:

NSEL-NSDNR-01-02	Hugh Gillis Planning and Development Officer	Note: Under the section dealing with Species at Risk, reference should be made to NSDNR General Status of Wildlife process and COSEWIC, in addition to ACCDC.
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Response:

EA Section 1.4.1 references these processes, and Section 8 individual VEC sections reference information sources consulted in determining the status of the species discussed.

Comment:

NSEL-NSDNR-01-03	Hugh Gillis Planning & Development Officer	Wetland Inventory - The data sources used by the proponent did not make reference to the NS Department of Natural Resources GIS Wetlands Inventory and database. The data sources which were consulted together with analysis of aerial photos carried out on behalf of the proponent present a somewhat different picture of wetland habitat present on the site than is contained within NSDNR's database. The discussion of wetland habitat on the site should be rationalized against the NSDNR data (as per Attachments 'A' and 'B') particularly in terms of number of wetlands, location, size and configuration. We accept that classification may differ as NSDNR's inventory is based upon photo rather than ground interpretation.
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Response:

The wetland delineations described in the EA are based on a combination of air photo interpretation and ground truthing. By way of example, Wetlands 3 and 4 are combined as one wetland as in the DNR mapping. Ground truthing discovered that the two wetlands were in fact located in discreet basins separated by a rocky ridge that supported a small barrens. The eastern edge of Wetland 2 was delineated in this fashion. Two fingers of wetland habitat extending to the east from the main body of the wetland are shown on the NSDNR mapping; however, they could not be located during the site survey. The eastern edge of the wetland was followed using a GPS to delineate the wetland edge. The fingers of wetland habitat turned out to be part of an old woods road and a long thin stand of mixedwood forest.

Wetland evaluations were conducted for all wetlands within the Project area with the exception of Wetland 6 which was not included in the original Project area. Two highly experienced biologists conducted site visits in April, June and late July 2003 to complete varied bird surveys, vegetation surveys, mammal and herpetile surveys, to be incorporated into the wetland evaluations. While standard information sources such as topographical mapping, aerial photography, the Wetland Atlas and available digital mapping sources were consulted prior to field visits to determine the presence of potential wetlands on site, ground truthing was the key to wetland delineation. These detailed surveys rather than Golet scores, were the key to completing the evaluations.

A number of methods were employed to determine the actual extent of the wetlands such as a visual examination, an inspection to determine the delineation of vegetation indicative of wetlands, and most importantly, the experience of the evaluators. It is acknowledged that there are differences between the wetland mapping provided by the NSDNR GIS Wetlands Inventory and Database and that which appears in the document; however, as noted, the wetlands as they appear in the EA document are based on actual field investigations.

The importance of wetlands as habitat as well as other vital roles such as water purification and groundwater recharge has been recognized by the proponent throughout the facility site selection process. The final site was selected from nine different locations and configurations, all of which

required some consideration of wetlands and watercourses, and rare species, as well as land availability and engineering feasibility. The current site was selected to minimize potential environmental impacts, in particular to watercourses and wetlands. Any potential impacts wetlands will be mitigated where avoidance is not feasible. It is further noted, that should it be required, the proponent is willing of consider wetland compensation to replace any wetland habitat or functions that may be lost.

Wetland evaluations conducted for the Project employed standard provincial and federal evaluation techniques, in particular the North American Conservation Council (Canada) wetland evaluation (federal) and the Ten Step Wetland Evaluation (provincial) processes. These evaluation techniques, coupled with detailed surveys, provide for consideration of wetland components, functions and attributes within a provincial regional and watershed context. These wetland evaluation techniques have formed the basis for numerous environmental assessments and permit applications undertaken by Jacques Whitford in recent years and approved by federal and provincial regulators. Alternative valuation techniques suggested in NSEL-NSDNR-01-08 have been noted.

Comment:

NSEL-NSDNR-01-04	Hugh Gillis Planning & Development Officer	Wetland Importance / Valuation The Evaluation Criteria (pages 8-49) used by the proponents have a significant adverse effect occurring “A...when there is a loss of wetland functions in a wetland of significant value as determined through a recognized evaluation system”. While this approach has been the standard for EAs, it does not necessarily capture the ecosystem importance of the site. Wetlands collectively contribute less than 7% of the land-cover of the province. All wetlands are important and changes in their ecological character (defined as... the impairment or imbalance in any biological, physical, or chemical components of the wetland ecosystem, or in their interactions, which maintain the wetland and its products, functions and attributes) caused by human activity should be mitigated if avoidance is not an option. As a last resort, compensation should be provided for the loss of ecosystem services.
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Response:

Please refer to response to NSDNR-01-03.

Comment:

NSEL-NSDNR-01-05	Hugh Gillis Planning & Development Officer	Consultants undertaking Environmental Assessment reports for proponents of projects have traditionally relied extensively upon two series of maps, the Wetland Atlas (1988) and Important Freshwater Wetlands and Coastal Wildlife Habitats (1991), to assess the significance of the wetland as wildlife habitat. The Golet score (based on air photo interpretation) was a key determinant in the identification of significance in these map series. This often lead the consultant to conclude that a wetland with a Golet score of less than 65 has minimal value as wildlife habitat.
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Response:

Please refer to response to NSDNR-01-03.

Comment:

NSEL-NSDNR-01-06	Hugh Gillis Planning & Development Officer	The current wetland inventory does not assign a Golet score to a wetland. Developed as a tool to assist in planning, the Golet score had increasingly and improperly been used to determine the overall significance of the wetland. The Golet score is rather one measure of ‘potential biodiversity’ associated with wetland habitat rather than its significance as wildlife habitat. Higher scoring wetlands signify those with the potential for increased biodiversity. However, wetlands with a low Golet score may be unique systems or provide important habitat for rare or threatened species -- the lower the score the less diverse the community and thus increased probability that unique or unusual species may be found. This is the situation in the current proposal. Southern Twayblade and Northern Commandra are associated with wetlands which would have received a low Golet score.
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Response:

Comment noted.

Comment:

NSEL-NSDNR-01-07	Hugh Gillis Planning & Development Officer	In our review of registration documents for developments that may impact wetlands, we no longer refer to the above map sources but rather assess the potential impact on wetland components, functions and attributes within a provincial, regional, and watershed context.
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Response:

Please refer to response to NSDNR-01-03.

Comment:

NSEL-NSDNR-01-08	Hugh Gillis Planning & Development Officer	This information is from in-house sources and that provided by the proponents. The ecosystem value of a wetland is best determined through on-site investigations using a comprehensive valuation methodology that assesses component, functional, and attribute values. The proponents have used the VEC approach (Beanlands and Duinker1983). Alternative valuation approaches are described in Barbier et al (1996) which not only consider the market value resulting from the conversion of the wetland to an alternate use, but also the foregone values that the converted resource can no longer provide. This type of analysis provide a basis to assess the project’s overall impact on land use.
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Response:

Please refer to response to NSDNR-01-03.

Comment:

NSEL-NSDNR-01-09	Hugh Gillis Planning & Development Officer	In providing for the Southern Twayblade, impacts to wetland 2 will be avoided. A reconfiguration of the layout of the project should be considered to minimize impacts to wetlands 1 and 5. Impacts due to fence construction will be minimal and short term. A condition of the project must be a detailed mitigation and monitoring plan to be included in the Project EPP, developed in consultation with the Nova Scotia Department of Natural Resources (Wildlife Division) and the Nova Scotia Department of Environment and Labour.
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Response:

During the conceptual and preliminary engineering design, the terminal layout has gone through many iterations to determine the best location for the facility that will minimize the environmental impact to the existing wetlands. Any further movement of the facility layout could potentially create more impact to other existing wetlands. A detailed mitigation and monitoring plan will be developed and implemented to minimize any further impacts from construction and operation of the facility. This plan will be developed with consultation with the NSDNR Wildlife Division and NSEL.

Please refer to the response to NSEL-NSDNR-01-01 for further discussion of the potential for relocation and reconfiguration of the Project footprint. The proponent agrees that a detailed mitigation and monitoring plan should be developed to protect the southern twayblade population. The NSDNR Wildlife Division was consulted and additional detail regarding mitigation, monitoring and follow-up with regard to the twayblade population will be developed with input from NSDNR. The mitigation and monitoring plan will be included in the Project EPP, and NSDNR (Wildlife Division) will be consulted in the final design of this plan.

Comment:

NSEL-NSDNR-01-10	Hugh Gillis Planning & Development Officer	Appendix G. Wetland Evaluations. This section provides a detailed Wetland Evaluation using the NAWCC (Canada) Guidelines only for Wetland 2 (NSDNR Wetland U4555613-195)) because those sources consulted on behalf of the proponent indicate this is the only wetland on the site of the proposed activity which is 2.0 ha or larger in size. Consultation of the NSDNR GIS Wetlands Database indicates two other wetlands, Wetland 1 (NSDNR U4555612-254) and Wetland 6 (NSDNR U4555613-185) are also greater than 2.0 ha in size. Both of these wetlands would be subject to review under the NAWCC framework.
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Response:

As discussed in the response for NSEL-NSDNR-01-03 wetland delineations and areas were based on a combination of air photo interpretation and ground truthing. In some instances ground truthing involved the use of GPS to map the margin of the wetland. The wetland evaluators are confident of the wetland delineations for all of the wetlands with the exception of Wetland 6. At the time of the field surveys

Wetland 6 was outside the area affected by the Project. Wetland 6 (security fence crossing) will be surveyed in 2004, the size of the wetland will be determined, and a wetland evaluation will be conducted. It is the understanding of the evaluators through dialogue with NSEL that the trigger to use either the Nova Scotia 10 step wetland evaluation process or the North American Wetland Conservation Council (Canada) wetland evaluation technique is based on the amount of wetland habitat affected rather than the overall size of the wetland. In the case of Wetland 2, the NAWCC technique was used because there was some potential for hydrological effects that could affect the entire wetland. The type of wetland evaluation that will be chosen for Wetland 6 will be determined after the site survey is conducted. At that time, the size and configuration of the wetland will be determined as well as a more accurate prediction of how much wetland habitat would be affected by construction of a chain link fence through the wetland.