

From: D. McDonald, Project Manager, Canadian Environmental Assessment Agency
To: A. Perry, Regional Manager, Nova Scotia, BP Canada Energy Group ULC

Dear Ms. Perry,

On December 23, 2016, the Canadian Environmental Assessment Agency (Agency) sent 85 information requests (IRs) to BP Canada Energy Group ULC (the proponent) based on the Agency's and other federal government experts' technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Scotian Basin Exploration Drilling Project. The Agency has now also analyzed the submissions from the public and Indigenous peoples and requests further information as elaborated in this document. The Agency has also identified several additional IRs based on its review that were not included in the December 23 request.

The Agency requires acceptable responses to the IRs in order to complete its review of the EIS and to proceed with the preparation of its Environmental Assessment Report. Once you have submitted complete responses to all IRs, the Agency will take a period of up to 15 days to form an opinion on whether the requested information has been provided. If, at that time, the Agency determines the responses to be complete, it will commence a technical review of the additional information and the timeline for the environmental assessment will resume the following day. If the responses are determined to be incomplete, you will be notified at that time. For further information, please consult the Agency document *Information Requests and Timelines* <https://www.canada.ca/en/environmental-assessment-agency/news/policy-guidance/information-requests-timelines.html>.

The responses may be in a format of your choice; however the format must be such that the responses to individual IRs can be easily identified. You may wish to discuss certain IRs with the Agency or others as necessary to obtain clarification or additional information, prior to submission of the responses. Working directly with interested parties prior to responding to the Agency, will help to minimize the potential for additional IRs related to your responses.

The IRs and your responses will be made public on the Canadian Environmental Assessment Registry (CEAR) Internet site. Please note that the Agency may request further information at any time during the environmental assessment process.

Please confirm receipt of this message to Friederike Kirstein and contact me if you require further information.

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Scotian Basin Exploration Drilling Project
Information Requests (IRs) from Environmental Impact Statement Review
February 17, 2017

INTRODUCTION

On December 23, 2016, the Canadian Environmental Assessment Agency (Agency) sent 85 information requests (IRs) to BP Canada Energy Group ULC (the proponent) based on the Agency's and other federal government experts' technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Scotian Basin Exploration Drilling Project. The Agency has now also analyzed the submissions from the public and Indigenous peoples and requests further information as elaborated in this document. The Agency has also identified several additional IRs based on its review that were not included in the December 23 request.

ACRONYMS AND SHORT FORMS

BOP: Blowout preventer

BP: BP Canada Energy Group ULC (proponent)

CEAA: Canadian Environmental Assessment Agency

CNSOPB (or the Board): Canada-Nova Scotia Offshore Petroleum Board

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

DFO: Fisheries and Oceans Canada

ECCC: Environment and Climate Change Canada

EIS: Environmental Impact Statement

EL: Exploration Licence

FSC: Food, social and ceremonial

IR: Information request

LAA: Local assessment area as defined in the EIS

MMO: Marine mammal observer

MNNB: Maliseet Nation of New Brunswick

MTI: Mi'gmawe'l Tplu'taqnn Incorporated

MODU: Mobile offshore drilling unit

NCNS: Native Council of Nova Scotia

OWTG: *Offshore Waste Treatment Guidelines*

OCSG: *Offshore Chemical Selection Guidelines for Drilling & Production Activities on Frontier Lands*

PA: Project area as defined in the EIS

PSV: Platform supply vessel

RAA: Regional assessment area as defined in the EIS

ROV: Remotely-operated vehicle

SBM: Synthetic-based drilling mud

SFN: Sipekne'katik First Nation

VC: Valued component

VSP: Vertical seismic profiling

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INFORMATION REQUESTS (IRs)

EA Method

IR 086 (MNNB-39)

Applicable CEAA 2012 effect(s)¹: All

EIS Guidelines Reference: Part 2, Section 5.0 Aboriginal Engagement and Concerns and Section 3.3.2 Valued components to be examined

EIS Reference: 4.1 Aboriginal Engagement Objectives; 4.4 Aboriginal Engagement Activities; 4.5 Questions and Comments Raised During Aboriginal Engagement; 6.0 Environmental Effects Assessment Scope and Methods

Context and Rationale: According to the *Guidelines for the Preparation of an Environmental Impact Statement* (the Guidelines), interested groups, including Indigenous communities, may recommend VCs. If a VC suggested by an Indigenous group is not included in the EIS, the proponent must explain why it was excluded (Guidelines, Part 2, Section 5.0, page 15). In addition, the Guidelines state that “the EIS will identify those VCs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or that the proponent considers likely to be affected by the Project. In doing so, the EIS will indicate to whom these concerns are important and the reasons why, including environmental, Aboriginal, social, economic, recreational, and aesthetic considerations. If comments are received on a component that has not been included as a VC, these comments will be summarized.” (Guidelines, Part 2, Section 3.3.2, page 4).

The MNNB noted that the EIS discusses how, in part, VCs were identified in the course of examining issues raised by Indigenous peoples, directing readers to Section 4 and Appendix B of the EIS for more information (EIS, Section 6.2.2, page 6.7). However, the MNNB noted that Section 4 does not clearly show which questions and comments resulted in identifying VCs subsequently examined in the EIS.

Specific Question or Request: Identify which VCs, if any, were included as a result of concerns raised by Indigenous peoples, when concerns or recommendations were raised to the proponent, and why they were described as important. If recommended VCs were not included in the EIS, explain why.

IR 087 (MNNB-40)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 1, Section 4.2 Study Strategy and Methodology

EIS Reference: 4.1 Aboriginal Engagement Objectives; 4.4 Aboriginal Engagement Activities; 4.5 Questions and Comments Raised During Aboriginal Engagement; 6.2.2 Selection of Valued Components; 7.2.2, 7.3.2, 7.4.2, 7.5.2, 7.6.2, 7.7.2; 6.2.3.2 The Influence of Engagement on the Assessment

¹ See legend at end of document for a description of applicable environmental effects

Context and Rationale: The Guidelines direct the proponent to show the methods it used to assess project-related effects on valued components and to “ incorporate into the EIS the community and Aboriginal traditional knowledge to which it has access or that is acquired through Aboriginal and public engagement activities.”

The EIS documents engagement activities that were conducted by the proponent in developing its EIS. The MNNB has commented that demonstrations of effective integration of traditional knowledge in the EIS are vague. For example, the EIS states that the identification of special areas was “based on a compilation of scientific expert opinion and traditional knowledge that was solicited through efforts to support integrated ecosystem-based management efforts on the Scotian Shelf (Doherty and Horsman 2007)” (EIS, Section 5.2.10, page 5.207; Table 5.2.20, page 5.210). However, the cited reference does not appear to include any traditional knowledge. This leaves the role of traditional knowledge in the EIS unclear to the MNNB.

Section 7 assesses the potential effect of the Project on species occurring in the area of the Project. Each subsection includes a paragraph titled “The Influence of Engagement on the Assessment.” Section 7.2.2 (page 7.19) of the EIS (influence of engagement on assessment of fish and fish habitat) states that: “Key issues raised during stakeholder and Aboriginal engagement for the Project to date include general concerns related to potential Project effects (and cumulative effects) on the marine environment including fish species at risk, commercial fish species, and/or fish species that have been identified as having significance to Mi’kmaq and/or Wolastoqiyik (Maliseet) culture. Questions and concerns were raised with respect to effects of routine discharges and spills on fish populations and migration, feeding, and spawning activities that could be occurring in the affected area”. There is a similar section for each VC, modified as appropriate to the specific VC, but none discuss the influence of traditional knowledge. The phrase “traditional knowledge” is used only a few times in the entire EIS. The Agency notes that only Woodstock and St. Mary’s First Nation fishery directors were interviewed as part of BP’s consultation effort, and that the other four New Brunswick Maliseet communities were not consulted.

Specific Question or Request: Clarify what traditional knowledge was incorporated in the EIS, how it was obtained (e.g. from what community), and how it was incorporated into the analysis. Provide specific examples from the EIS.

IR 088 (MNNB-43)

Applicable CEAA 2012 effect(s): 5(1)(c)

EIS Guidelines Reference: Part 1, Section 4.2 Study Strategy and Methodology

EIS Reference: 4.1 Aboriginal Engagement Objectives; 4.4 Aboriginal Engagement Activities; 4.5 Questions and Comments Raised During Aboriginal Engagement; 7.2.2, 7.3.2, 7.4.2, 7.5.2, 7.6.2, 7.7.2 The Influence of Engagement on the Assessment

Context and Rationale: The Guidelines direct the proponent to “provide Aboriginal groups the opportunity to review and provide comments on the information used for describing and assessing effects on Aboriginal peoples. Where there are discrepancies in the views of the proponent and

Aboriginal groups on the information to be used in the EIS, the EIS will document these discrepancies and the rationale for the proponent's selection of information" (Guidelines, Section 4.2, page 6). There is no indication in the EIS that Aboriginal groups reviewed the EIS prior to its submission to the Agency (EIS, Table 4.4.1, pages 4.13-19).

Specific Question or Request:

- a) Clarify the extent to which Indigenous groups were given an opportunity to review and provide comments on the information used for describing and assessing effects on Indigenous peoples prior to submission of the EIS. If so, describe when and how this occurred.
- b) Provide the results of any pre-submission Indigenous reviews, including the discussion of potential discrepancies as required in the Guidelines.

Fish and Fish Habitat

IR 089 (NCNS-01)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat

EIS Reference: 7.2 Fish and Fish Habitat; 7.2.10 Follow-up and Monitoring

Context and Rationale: Section 7.2.10 of the EIS states that "BP will assess in consultation with the appropriate authorities the potential for undertaking an acoustic monitoring program during the drilling program to collect field measurements of underwater sound in order to verify predicted underwater sound levels. The objectives of such a program will be identified in collaboration with DFO and the CNSOPB and in consideration of lessons learned from the underwater sound monitoring program to be undertaken by Shell as part of the Shelburne Basin Venture Exploration Drilling Project in 2016."

Specific Question or Request: Further to IR 085, which requests additional information about the proposed follow-up program, does the proponent intend to make the results of the acoustic monitoring program publicly available?

IR 090 (NCNS-02 and NCNS-03)

Applicable CEAA 2012 effect(s): 5(1)(a)(i)

EIS Guidelines Reference: Part 2, Section 3.2 Project Activities

EIS Reference: 2.4.4 Well Abandonment; 7.1.5 Well Abandonment

Context and Rationale: Section 7.1.5 of the EIS states that "The final well abandonment program has not yet been finalized; however these details will be confirmed to the CNSOPB as planning for the Project continues" and that "approval may be sought to leave the wellhead in place."

Specific Question or Request:

- a) State whether the proponent intends to share the well abandonment program (plan) with the Native Council of Nova Scotia or others for comment during its development, prior to CNSOPB approval.
- b) Provide the criteria that the proponent would apply in assessing whether or not to abandon a wellhead in place.

IR 091 (MTI-13)

Applicable CEAA 2012 effect(s): 5(1)(c); 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat and 6.1.5 Species at Risk and Species of Conservation Concern

EIS Reference: 7.2 Fish and Fish Habitat

Context and Rationale: MTI noted that there is a no specific assessment of Project operations on Winter Skate. Winter Skate is a species of conservation concern for MTI. The Gulf of St. Lawrence and Eastern Scotian Shelf-Newfoundland winter skate populations have been assessed by COSEWIC as Endangered. The 2015 COSEWIC assessment and status report states that “fishers have noted females extruding complete cases only in the late summer-early autumn west of Sable Island, suggesting that this may be a spawning area”. MTI suggested that the region around Sable Island may be the only known successful winter skate spawning grounds left within the Scotian region. Although the EIS provides spawning and hatching periods for the winter skate (Table 5.2.3), the proponent has not assessed the potential effects of Project operations on this species.

Specific Question or Request: Assess the potential effects of the Project specifically on winter skate, including the potential effects of underwater sound from the Project on the behaviour, distribution, and movement of winter skate, taking into consideration potential effects on eggs and larvae. Also ensure that the Eastern Scotian Shelf-Newfoundland population, individuals of which may be present within the RAA, is considered in the stand-alone species-at risk analysis that was requested in IR 050.

Marine Mammals and Sea Turtles

IR 092 (MTI-08)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.1.5 Species at Risk and Species of Conservation Concern and 6.1.6 Marine Mammals

EIS Reference: Section 7.3.8.3 Characterization of Residual Project-Related Environmental Effects, pg. 7.67

Context and Rationale: MTI has expressed concern that there is no specific assessment of individual whale species, in particular the endangered North Atlantic Right Whale, a culturally-significant species to MTI. Critical habitat for the Right Whale has been identified in Roseway Basin on the Scotian Shelf within

the RAA. The sound generated by the MODU will be continuous throughout the drilling program. There will also be sound from vessel traffic associated with MODU operations. Underwater sound may interfere with the ability of North Atlantic Right Whales and other whale species to navigate and communicate. The Proponent has stated that the effects of MODU operations on marine mammals are predicted to be not significant.

Specific Question or Request: Further to the general assessment of effects on marine mammals and IR-050 (species at risk), discuss the potential effects of MODU operation and vessel traffic specifically on the behaviour, distribution and movement of North Atlantic Right Whales.

IR 093 (MNNB-08)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.1.6 Marine Mammals, 6.1.7 Marine Turtles, and 8.2 Monitoring

EIS Reference: 7.3.3 Marine Mammals & Sea Turtles

Context and Rationale: The EIS states that the "Project could also result in changes in availability, distribution, or quality of prey items and habitat for marine mammals and sea turtles as a result of underwater sound or operation discharges (refer to Section 7.2 for an assessment of effects on prey species)" (pg. 7.48). The MNNB acknowledged that fish are important prey for many marine mammal species and that effects on fish are assessed in Section 7.2. The MNNB noted that some species, such as the North Atlantic Right Whale, forage on zooplankton (e.g. copepods). While the proponent provided a high level discussion of the zooplankton community in the region, no baseline data on the distribution of zooplankton inside the PA was provided.

Specific Question or Request: Discuss how the Project could affect the distribution, abundance or quality of zooplankton in the LAA, including during regular operations and as a result of accidents and malfunctions. Discuss how such changes could affect marine mammals and sea turtles that rely on this food source, with specific consideration of potential effects on species at risk.

IR 094 (MNNB-09)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.1.6 Marine Mammals and 6.1.7 Marine Turtles

EIS Reference: 7.3 Marine Mammals and Sea Turtles

Context and Rationale: The MNNB noted that while extensive discussion was provided about marine mammals and underwater sounds in Section 7.3, as well as information on the drilling noise expected, there is no direct comparison between expected frequencies of the drilling noise (Hz) and overlap with marine mammal hearing ranges for the potentially-affected species. The assessment would be aided by a table or figure that displays the hearing range (Hertz) and tolerance (decibels) for marine mammals in

comparison to expected drilling sound frequencies and levels, as well as noise from other Project activities. The EIS provides a table of hearing thresholds by functional hearing range (e.g. low-frequency cetaceans – Table 7.3.4) and lists mammals and sea turtles known to occur near the PA (Tables 5.2.9 and 5.2.12, respectively), but does not indicate which species are in which hearing range.

Specific Question or Request: Further to IR 058 (cumulative effects of noise), provide a table directly comparing marine mammal and sea turtle hearing ranges and tolerances to the expected sound frequencies and levels expected to be directly emitted by the Project.

IR 095 (MNNB-10)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.1.6 Marine Mammals, 6.1.7 Marine Turtles, and 6.6.3 Cumulative effects assessment

EIS Reference: Section 7.3.8.3 Characterization of Residual Project-Related Environmental Effects, pg. 7.67

Context and Rationale: The MNNB noted that "there have been no documented cases of marine mammal or sea turtle mortality stemming from exposure to sound from exploration seismic surveys. However, it has been suggested that the typical monitoring programs implemented for mitigation purposes during offshore activities may not detect sub-lethal or longer-term effects that could have occurred (DFO 2004)" (pg. 7.67). The MNNB asked if and how the proponent plans to monitor for assessing potential sub-lethal or longer-term effects of seismic (VSP) or drilling activities in the marine environment. While the EIS assesses potential sub-lethal effects such as behavioural changes or effects on habitat quality, there does not appear to be any discussion of longer-term effects, such as could be linked to behavioural or habitat changes.

Specific Question or Request: Assess the potential for VSP and drilling activities to cause longer-term effects on marine mammals and sea turtles. Further to IR-085 (follow-up program), indicate whether the proponent intends to include monitoring for longer-term effects in its follow-up program and provide an associated rationale.

IR 096 (MNNB-11)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Sections 6.1.6 Marine Mammals, 6.1.7 Marine Turtles and 6.4 Mitigation

EIS Reference: Section 7.3.9 Determination of Significance, pg. 7.79

Context and Rationale: The EIS states that "MMOs will be employed to monitor and report on sightings of marine mammals and sea turtles during VSP surveys (see Section 7.3.8.2). Monitoring will include visual observations and the use of PAM (passive acoustic monitoring) to inform decisions related to

mitigation actions required during VSP operations when baleen whales, sea turtles, or any marine mammal listed on Schedule 1 of SARA are detected within a minimum 650 m predetermined exclusion zone" (pg. 7.79). The EIS also states that "MMO duties will include watching for and identifying marine mammals and sea turtles; recording their numbers, distances and behaviour relative to the VSP survey; initiating mitigation measures when appropriate (e.g. shutdown); and reporting results. Following the program, copies of the marine mammal and sea turtle observer reports will be provided to DFO and the CNSOPB" (pg. 7.79).

It is unclear to the MNNB from these descriptions how the proponent plans to determine that the 650-metre exclusion zone is effective.

Specific Question or Request: Describe the anticipated effectiveness of visual observations and the use of PAM to detect marine mammals and turtles that may be in the area and could potentially be affected by underwater sound from the Project. Describe whether and how the observations of marine mammals and turtles could lead to the implementation of additional mitigation measures such as a shut-down; provide examples.

Migratory Birds

IR 097 (MNNB-15, MNNB-26)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.1.4 Migratory Birds and their Habitat and 6.3.5 Migratory Birds

EIS Reference: 5.2.8 Migratory Birds; Table 5.2.13 Marine Birds of the Scotian shelf and slope, p. 5.154; 7.4 Migratory Birds

Context and Rationale: MNNB noted that Table 5.2.13 in the EIS leaves out several seabird species occurrences that have been documented near the PA, which is (or is close to) the seabirds' prime ocean habitat. The MNNB stated that seabirds that have been documented to occur in or near the RAA but omitted from Table 7.4.3 include Bermuda, Black-capped, Fea's Petrels, Barolo, Audubon's and Yelkouan Shearwaters, White-faced Storm-Petrel, Band-rumped Storm-Petrel, and European Storm-Petrel. Zino's Petrel and Scopoli's Shearwater may also occur. These include species that, although not COSEWIC-assessed or SARA-listed, are considered globally-rare or endangered (BirdLife International, 2016). Those species, when in Canada, are protected by the *Migratory Birds Convention Act*. The MNNB expressed concern about effects on globally-rare species that are difficult to detect, compared to more common species. The MNNB noted that fast-flying seabirds, among the most vulnerable to fatal light attraction of any bird group (Brooke 2004, Rodríguez and Rodríguez 2009, Rodríguez et al. 2012, Rodríguez et al. 2014), occur off Nova Scotia in small numbers, but the few individuals that use the area are crucially significant to these species' populations because their world population size is so low.

MNNB has advised that the following species have ranges (either maximal or core) that overlap with the Nova Scotia offshore shelf or slope areas or have been observed in these waters:

- Bermuda Petrel (*Pterodroma cahow*)

- Black-capped Petrel (*Pterodroma hasitata*)
- Fea's Petrel (*Pterodroma feae*)
- Zino's Petrel (*Pterodroma madeira*)
- Yelkouan Shearwater (*Puffinus yelkouan*)
- Barolo Shearwater (*Puffinus baroli*)
- Audubon's Shearwater (*Puffinus lherminieri*)
- White-faced Storm-Petrel (*Pelagodroma marina*)
- Band-rumped Storm-Petrel (*Oceanodroma castro*)
- European Storm-Petrel (*Hydrobates pelagicus*)

In addition, MNNB advised that Cory's Shearwater (*Calonectris diomedea borealis*) (included in Table 5.2.13 of the EIS) has been reclassified into two taxa: Scopoli's Shearwater (*Calonectris diomedea*) and Cory's Shearwater (*Calonectris borealis*) (BirdLife International 2016) and that either of these species may occur in the study area. The status of Scopoli's Shearwater on the Nova Scotian continental slope is relatively unknown, but it has been recently recorded over the slope and deep water off the northeastern United States in similar habitat (Howell 2012).

MNNB has advised that there is suitable habitat for the following pelagic seabird species in the RAA: Fea's Petrel, Zino's Petrel, White-faced Storm-Petrel, Band-rumped Storm-Petrel, European Storm-Petrel, Barolo Shearwater, Cory's Shearwater and Audubon's Shearwater.

Specific Question or Request:

- a) Further to the assessment of effects on migratory birds in the EIS, and IR 043, which requests information for the Bermuda Petrel and Black-capped petrel, provide background information (i.e. seasonal distributions and important biological attributes), as appropriate, and assess potential project effects to each of the following species: Fea's Petrel, Zino's Petrel, White-faced Storm-Petrel, Band-rumped Storm-Petrel, European Storm-Petrel, Barolo Shearwater, Cory's Shearwater and Audubon's Shearwater. The level of analysis for each additional species should be similar to that provided in the EIS for Peregrine Falcon, Piping Plover and Savannah Sparrow. The assessment should review the vulnerability of each of the petrel species to fatal light and flare attraction.
- b) Lee (2000) references the development of gas or oil fields off the coast of South Carolina as a grave threat to the remaining Black-capped Petrels at sea. Discuss the relevance of Lee (2000) to the assessment of effects of the Project.

IR 098 (MNNB-17)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Section 6.1.4 Migratory Birds and their Habitat

EIS Reference: 5.2.8 Migratory Birds

Context and Rationale: The MNNB noted that during the monitoring program undertaken for the Tangier 3D Seismic Survey, “vessel crews encountered 19 stranded birds and 26 dead birds. The stranded birds consisted of 18 Storm-Petrels and one Magnolia Warbler. The majority of deceased birds were passerines (RPS 2014)” (EIS, Section 5.2.8.1, pg. 5.158). The MNNB noted that the number of birds that survived stranding and the species composition of the dead birds provide context for understanding the nature and potential magnitude of effects on migratory birds.

Specific Question or Request: Review the results of the monitoring program from the Tangier 3D Seismic Survey and discuss the relevance of the results to the Project. Specifically, and to the extent known:

- a) indicate if the occurrence of stranded and dead birds is associated with nocturnal attraction to lights. If not, indicate potential alternative cause;
- b) describe what was done with the stranded birds;
- c) provide the post-encounter survival rate of the stranded birds and explain how it was determined; and
- d) provide the species composition of the dead birds.

Describe how the above-noted information affects the assessment of effects of the Project on migratory birds.

IR 099 (MNNB-34)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.3.5 Migratory Birds, 6.4 Mitigation and 6.6.3 Cumulative Effects Assessment

EIS Reference: 10.2.5 Assessment of Cumulative Environmental Effects on Migratory Birds, 10.2.5.1 Change in Risk of Mortality or Physical Injury, p. 10.39

Context and Rationale: The EIS states that “routine checks for stranded birds on the MODU and PSVs and appropriate procedures for release (i.e. the protocol outlined in *The Leach’s Storm Petrel: General Information and Handling Instructions* (Williams and Chardine, 1999)) will be implemented to mitigate the environmental effects of Project-related artificial night lighting and flaring on birds” (EIS, Section 10.2.5, p 10.41). The MNNB has noted that there is no evidence presented to support that birds captured and released in accordance with the protocol survive.

Specific Question or Request: Further to IR 098 which asks about general survival rates of stranded birds, indicate if there is literature or data available about survival rates of stranded storm-petrels released specifically in accordance with the Williams and Chardine protocol (or ECCC’s expanded protocol as discussed in IR 042). Provide a summary of information found and discuss any implications for the prediction of effects from the Project.

IR 100 (MNNB-18)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Section 6.1.4 Migratory Birds and their Habitat

EIS Reference: 5.2.8 Migratory Birds, p. 5.160

Context and Rationale: The MNNB is aware that the Nova Scotia continental shelf area has been subjected to extensive ship-based seismic surveys and these vessels normally carry observers on board to conduct marine bird surveys. The EIS states that “most of the surveys were conducted from either oil industry supply ships or DFO research/fishery patrol vessels with a small number of surveys conducted from ferries, cargo vessels, seismic ships or sailboats” (Section 5.2.8.1, p. 5.160). The MNNB stated that it considers marine bird survey information from seismic ships to be important baseline information because few other survey vessels have covered the remote Nova Scotia continental slope area.

Specific Question or Request: Review seabird survey data from seismic ships from the Nova Scotia continental slope as relevant to the assessment of effects of this Project, including observations of seabirds (such as Bermuda and Black-capped Petrels) that were made by Mike Force (2014) and Bruce Mactavish (2003). Describe how resulting information affects the assessment of effects of the Project on migratory birds.

IR 101 (MNNB-19)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Section 6.1.4 Migratory Birds and their Habitat

EIS Reference: 5.2.8 Migratory Birds, p. 5.166

Context and Rationale: The EIS states that “shearwaters are common summer and fall visitors on the Scotian Shelf and Slope but spend the winter months in the southern hemisphere, where they breed” (EIS, Section 5.2.8.1, p. 5.166). The MNNB has noted that among the shearwater species mentioned, only Great and Sooty Shearwaters spend the winter months breeding in the southern hemisphere (Brooke 2004). Cory’s Shearwaters breed in the Mediterranean (Scopoli’s) and in the Azores, Madeira and Canary Islands (Cory’s) in the northern hemisphere (Brooke 2004).

The MNNB advised that Manx Shearwaters breed only in the northern hemisphere in summer (mostly British Isles, also in Newfoundland, approximately 280 nautical miles (520 kilometres) northeast of the RAA (Roule 2010) and winter (non-breeding) in the South Atlantic (Brooke 2004). Audubon’s Shearwaters breed only in the northern hemisphere in summer (Caribbean, extirpated from Bermuda) and do not migrate to the South Atlantic (Brooke 2004).

Specific Question or Request: Discuss whether this new breeding-location information would influence the conclusions about potential effects on migratory birds. Provide an update to the assessment of effects, as appropriate.

IR 102 (MNNB-25)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Section 6.3.5 Migratory Birds

EIS Reference: Section 7.4.3 Potential Environmental Effects, Pathways and Measurable Parameters, p. 544; 7.4.5 Criteria for Characterizing Residual Environmental Effects and Determining Significance, p. 7.86)

Context and Rationale: The EIS states that “the RAA is restricted to the 200 nautical mile limit of Canada’s Exclusive Economic Zone (EEZ), including offshore marine waters of the Scotian Shelf and Slope within Canadian jurisdiction” (Section 7.4.3, p. 7.82). The MNNB noted that while migratory birds do not breed in the PA, their ranges include extensive parts of continental North America and the North and South Atlantic Oceans. Seabirds, in particular, are wide-ranging species whose breeding populations are based on remote islands and coastlines scattered across the Atlantic, Arctic and Antarctic Oceans. The MNNB has noted that the spatial area boundaries described in the EIS are political and likely do not reflect ecological boundaries.

The MNNB expressed concern that the definition of significant adverse residual effect used by the proponent, particularly that “natural recruitment may not re-establish the population(s) to its original level within one generation” (EIS, Section 7.4.5, p. 7.86) is not relevant to migratory birds occurring inside the RAA that breed outside the RAA. The limitation of effects assessment for migratory birds to the RAA therefore almost by definition omits attention to most potential effects on migratory birds, because the Project is sited on the open ocean and migratory birds do not breed on the sea surface. Due to density dependent factors, harmful effects on seabird populations might not measurably change abundance in the RAA (Lewis et al. 2001).

Specific Question or Request: Further to IR 004 that requests the rationale for the spatial scopes used the cumulative effects assessments, discuss how adjusting the spatial scope for migratory birds based on an ecological perspective that takes into account their full ranges and breeding locations could influence the analysis of cumulative effects on migratory birds. If it could affect conclusions, provide additional effects analysis.

IR 103 (MNNB-28)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.3.5 Migratory Birds and 6.4 Mitigation

EIS Reference: 7.4.8.2 Mitigation of Project-Related Environmental Effects, p. 7.92-7.93

Context and Rationale: The EIS states that “lighting will be reduced to the extent that worker safety and safe operations is not compromised. Reduction of light may include avoiding use of unnecessary lighting, shading, and directing lights towards the deck” (Section 7.4.8.2 p. 7.92-7.93). The MNNB expressed concern that without specific detailed information concerning what (and when) unnecessary lighting will be extinguished, exact dimensions and descriptions of shades for light fixtures, and exact dimensions

and descriptions of light fixtures in relation to directing light radiation towards the deck, is it very difficult to assess the effectiveness of this general mitigation measure. The MNNB also noted that blackout curtains or blinds on all portholes and windows are not mentioned as a mitigation measure for light attraction, even though this would appear to be helpful.

Specific Question or Request: Although it is not possible to provide exact lighting specifications until a MODU has been selected, the environmental assessment can assess the range of potential alternatives under consideration. In order to better understand potential effects of lights on migratory birds and related mitigation, the following information is required:

- a) Further to IR 018, which discuss alternatives that could reduce bird attraction to flares and lights, provide information, with examples, on whether there is unnecessary lighting as part of the Project that would be extinguished (e.g. blackout curtains or blinds on portholes); and
- b) Explain what measures would be implemented to direct light radiation inward towards work areas and limit light emanating from the MODU that could attract migratory birds. If specific information is not available, describe any industry best practices that would be followed.

IR 104 (MNNB-29)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Section 6.3.5 Migratory Birds

EIS Reference: 7.4.8.3 Characterization of Residual Project-Related Environmental Effects, Change in Risk of Mortality or Physical Injury, Presence and Operation of the MODU, p. 7.93

Context and Rationale: The MNNB has advised that the summary of seabird species vulnerable to light attraction on p.7.93 omits a variety of seabirds known to be light-attracted. For example, the MNNB stated that *Pterodroma* spp. petrels have been found to be vulnerable to fatal light attraction at fishing vessels in the southern ocean (Thompson 2013) and to fixed lighting on shore (Telfer et al. 1987, Le Corre et al. 2002, Rodríguez and Rodríguez 2009, Rodríguez et al. 2012, Rodríguez et al. 2014). Bermuda Petrel in particular was noted as vulnerable to light attraction by Beebe (1935). Band-rumped Storm-petrels in Hawaii were victims of light attraction (Telfer et al. 1987). Dovekies (Wiese et al. 2001) and other small auks (Dick and Donaldson 1978) and common eiders (Merkel and Johansen 2011) are known to be vulnerable to light attraction to vessels at sea and lighthouses. Merkel and Johansen (2011) also noted Thick-billed Murres, Black Guillemots and Long-tailed Ducks as victims of light-induced nocturnal bird strikes on vessels in Greenland. Wiese et al. (2001) described reports of large numbers of Dovekies being attracted to lights at offshore oil platforms in Newfoundland and recommended a long-term systematic investigation.

Specific Question or Request: Further to IR 043, which requests further information about effects on Bermuda and Black-capped Petrel, consider the potential occurrence of- and light attraction from the Project in relation to the other above-listed species. Update the effects assessment, proposed mitigation and conclusions of significance of potential effects on migratory birds, as applicable.

IR 105 (MNNB-30 and MNNB-31)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.3.5 Migratory Birds and 6.4 Mitigation

EIS Reference: Section 7.4.8.3 Characterization of Residual Project-Related Environmental Effects, p. 7.95

Context and Rationale: The effect of flaring and lights on birds is stated in the EIS to be reversible. The EIS states: “in consideration of mitigation, including efforts to reduce flaring and exposure to artificial lighting, the Change in Risk of Mortality or Physical Injury as a result of the presence and operation of the MODU is predicted to be adverse, low to moderate in magnitude, restricted to the PA, continuous throughout the Project, medium-term in duration, and reversible” (EIS, Section 7.4.8.3, p. 7.95).

The EIS also states that “With the application of proposed mitigation and environmental protection measures, the residual environmental effect.....on migratory birds during routine Project activities is predicted to be not significant. This conclusion has been determined with a high level of confidence based on an understanding of the general effects of routine exploration drilling and the effectiveness of mitigation measures. The greatest risk to migratory birds from routine Project activities and components was identified as a potential Change in Risk of Mortality or Physical Injury as a result of the presence of the MODU and the transiting PSVs (see Table 7.4.5)” (EIS, Section 7.4.9 Determination of Significance, p. 7.101).

The MNNB has advised the Agency that in its view, the conclusion of no significant environmental effect on bird populations from light attraction is not well-supported. The MNNB noted that gadfly petrels’ populations are especially vulnerable to fatal light attraction (e.g. Reed et al. 1985, Le Corre et al. 2002), indicating an extreme level of concern about the project’s potential effects on this species. As long-lived seabirds, the MNNB advises that these (and other seabird species mentioned in the EIS) are ‘survival-species’ vulnerable to any human-caused adult mortality (Saether and Bakke 2000) and project-induced fatalities could have serious consequences for their populations.

Specific Question or Request: Further to IR 041, which requests information about specific mitigation measures proposed to reduce effects of flaring, and IR 103 which requests further information about reducing light emissions from the MODU, describe if and how those measures have been shown to be effective in mitigating effects of lights on seabirds. Provide a rationale to support the prediction in the EIS that effects of flaring on birds are reversible. Support the response with peer reviewed literature or data, or indicate that no literature is available.

IR 106 (MNNB-32)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.3.5 Migratory Birds and 6.4 Mitigation

EIS Reference: 7.4.10 Follow-up and Monitoring, p. 7.101

Context and Rationale: The MNNB has advised that the following storm-petrels are known to occur in the RAA: Leach’s Storm-Petrel, Wilson’s Storm-Petrel, Band-rumped Storm-Petrel, European Storm-Petrel and White-faced Storm-Petrel (Endangered, BirdLife International 2016). While none of these species are SARA-listed or COSEWIC-assessed, they are migratory birds protected under the *Migratory Birds Convention Act* when in Canada and some of these species are identified globally as at risk (BirdLife International 2016). Three, including the globally-endangered White-faced Storm-Petrel, are not mentioned for crew education (e.g. “To differentiate between Wilson’s Storm-Petrel (*Oceanites oceanicus*) and Leach’s Storm-Petrel, photographs depicting their differences will be provided to crew members trained to check for and handle stranded birds” (EIS, Section 7.4.10, p. 7.101). The MNNB has also noted that other petrels that are vulnerable to light attraction and are known to occur in the RAA are not mentioned for crew education. These are: Bermuda, Black-capped, Fea and Zino’s Petrels. The MNNB is concerned that if crew members are not familiar with all possible storm-petrel and petrel species expected at the platforms (or if a protocol for collecting, freezing and passing all dead birds to experts for identification is not implemented), follow-up and monitoring of project environmental effects will not be rigorous or sufficient, especially for globally-endangered bird species.

Specific Question or Request:

- a) Provide a rationale for why the list of storm-petrels (and other petrels) slated for crew member education should be limited to two common species (Leach’s and Wilson’s Storm-Petrels), or update the list as appropriate.
- b) Explain how less-common petrel species would be identified during monitoring. Advise whether potential corpses would be collected for identification by experts.
- c) In the event that an individual of a bird species listed in Schedule I of SARA, or assessed by COSEWIC as endangered or threatened, is found dead on the platforms, describe what additional mitigation, if any, would be undertaken to prevent further mortality.

IR 107 (MNNB-33)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.3.5 Migratory Birds and 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment; 8.5.3.1 Project Pathways for Effects, Effects of Hydrocarbons on Migratory Birds, p. 8.114

Context and Rationale: The MNNB noted that two estimates of seabird mortality resulting from ‘operational oil spills’ are provided, one from 1991 and one from 1984. The MNNB further noted the EIS statement that “to help provide additional context, it is estimated that approximately 21,000 birds die annually from operational spills on the Atlantic coast of Canada, and 72,000 in all of Canada (Thomson et al. 1991). Clark (1984) estimated that 150,000 to 450,000 birds die annually in the North Sea and North Atlantic from oil pollution from all natural and anthropogenic sources” (EIS, Section 8.5.3.1, p 8.116). The MNNB questioned whether the estimates provided in the EIS remain relevant, given their age (25 years and 32 years, respectively).

Specific Question or Request: Advise whether there are more current estimates of seabird mortality from operational oil spills available that are relevant to the area potentially affected by the Project. If so, provide these estimates or describe efforts to locate them. Where additional estimates are found, describe whether they support or alter the assessment of effects on migratory birds included in the EIS. Update the effects assessment and impact predictions accordingly.

IR 108 (MNNB-36)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.3.5 Migratory Birds and 8 Follow-up and Monitoring Programs

EIS Reference: Section 12.2 Follow-up and Monitoring, Table 12.2.1 Summary of Follow-up and Monitoring Programs for the Scotian Basin Exploration Drilling Project (p. 12.3)

Context and Rationale: The EIS states that the proponent will “carry out routine checks for stranded birds or bird mortality on the MODU and PSVs and compliance with the requirements for documenting and reporting any stranded birds (or bird mortalities) to the CWS during the drilling program. If a species at risk is found alive (stranded) or dead on the MODU or PSV, a report will be sent to CWS within 24 hours of identification. Reporting of live migratory seabirds captured and released will be recorded in accordance with a Migratory Bird Permit issued by CWS. A bird monitoring report will be submitted to the CNSOPB within 90 days of well abandonment” (EIS, Section 12.2, p 12.3).

The MNNB has noted that globally-endangered bird species occur in the RAA and that it is unclear if bird species at risk other than those currently considered in the EIS (e.g. Section 5.2.8.4), such as species at risk on the International Union for Conservation of Nature (IUCN) Red List (BirdLife International 2016), would be included in this follow-up program. The MNNB also remarked that the results of a ‘routine check’ are most useful when the detection efficiency is known for both stranded and dead seabirds

Specific Question or Request:

- a) Clarify if globally-endangered or otherwise-at-risk seabirds (i.e. from the IUCN Red List, BirdLife International 2016) would be included in the stranded-birds monitoring and reporting procedures outlined in the EIS.
- b) Predict what proportion of seabirds that are stranded or die on the platform are expected to be detected via routine checks? What is the expected detection efficiency of the proposed routine check method?

IR 109 (MNNB-37)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.1.4 Migratory Birds and their Habitat and 6.3.5 Migratory Birds

EIS Reference: Figure 5.2.26; Appendix F Migratory Birds Distribution

Context and Rationale: The PA lies mostly beyond the shelf break over 100 nautical miles from land - an area with minimal seabird survey coverage in spring and summer (EIS, Figure 5.2.26). The MNNB commented that most of the area has never been transited by a seabird-survey vessel and it appears to have been transited by only eight cruises at all times of year.

Specific Question or Request:

- a) Clarify if expected seabird diversity and abundance in the PA is inferred from seabird surveys that have been conducted specifically within that area, or from surveys over the entire RAA; and
- b) Discuss the level of uncertainty associated with inferring seabird diversity and abundance in the PA based on the extent of current surveys. Discuss the extent to which additional surveys or additional data reviewed for IR 100 would reduce that uncertainty or could alter effects predictions.

IR 110 (MNNB-38)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.1.4 Migratory Birds and their Habitat and 6.3.5 Migratory Birds

EIS Reference: Appendix F Migratory Birds Figure 13 Petrels (p. 13)

Context and Rationale: Figure 13 of Appendix F in the EIS is captioned 'Petrels.' The MNNB noted that petrels (Northern Fulmar, gadfly petrels *Pterodroma* spp., etc.) are in the family Procellariidae along with the shearwaters (*Puffinus* spp.) (Brooke 2004). Storm-petrels (*Hydrobatidae*) include Wilson's and Leach's Storm-Petrels, etc. (Brooke 2004).

Specific Question or Request: Clarify if Figure 13 of Appendix F includes the distribution of petrels or storm-petrels (different bird families). If it does not, indicate where the distribution of storm-petrels (*Hydrobatidae*) is shown, or provide a new figure.

IR 111 (MTI-10)

Applicable CEAA 2012 effect(s): 5(1)(a)(iii) migratory birds

EIS Guidelines Reference: Part 2, Sections 6.1.4 Migratory Birds and their Habitat, 6.3.5 Migratory Birds and 6.4 Mitigation

EIS Reference: 7.4 Migratory Birds

Context and Rationale: MTI advised the Agency that, while concerns associated with light attraction are likely the main issue for migratory birds, it is concerned that underwater and atmospheric sound from the MODU may result in sensory disturbance to migratory birds, leading to behavioural responses such as temporary habitat avoidance or changes in activity state (e.g. feeding, resting, or travelling). The EIS stated that the effects of atmospheric sound are reversible and did not propose related mitigation.

Specific Question or Request: Discuss potential effects of underwater and atmospheric noise on migratory birds, including potential behavioural change such as habitat avoidance. Consider migratory bird routes and timing, and if there are particular periods when these birds could be more vulnerable and effects potentially more pronounced. Describe mitigation to address these effects, if appropriate.

Commercial Fisheries

IR 112 (SPANS-02)

Applicable CEAA 2012 effect(s): 5(1)(c)(i) and (iii); 5(2)(b)

EIS Guidelines Reference: Part 2, Section 6.3.9 Commercial Fisheries, and 6.4 Mitigation

EIS Reference: 7.6 Commercial Fisheries

Context and Rationale: If fishing gear is lost or damaged, the EIS indicates that the *Compensation Guidelines Respecting Damages Relating to Offshore Petroleum Activity* put in place by the CNSOPB in 2002 can handle claims. The Seafood Producers Association of Nova Scotia (SPANS) has advised the Agency that it has concerns about whether those guidelines would effectively compensate the fishing industry for losses that are caused by project-induced changes in the environment. Indigenous groups expressed similar concern.

Specific Question or Request: Describe how the proponent would manage claims for loss of, or damage to, fishing gear that are alleged to have been caused by project-induced changes in the environment.

IR 113 (SPANS-03)

Applicable CEAA 2012 effect(s): 5(1)(c)(i) and (iii); 5(2)(b)

EIS Guidelines Reference: Part 2, Sections 6.3.9 Commercial Fisheries, 6.4 Mitigation and 6.6.1 Effects of potential accidents or malfunctions

EIS Reference: 7.6 Commercial Fisheries; 8.0 Accidental Events; Appendix H: Oil Spill Trajectory Modelling

Context and Rationale: The EIS shows, in virtually all the stochastic modelling dealing with a worst-case blowout scenario, the potential for oil to reach highly utilized fishing banks along the Scotian Shelf. In the event of such a scenario, SPANS is concerned about effects on commercial fishing enterprises in both the short term (due to exclusion) as well as in the longer term (e.g. adverse effects on fish stocks and the habitat they rely upon, market loss due to product tainting or fears thereof). SPANS is particularly concerned that oil on Georges Bank could be detrimental to the life cycles of the many fisheries resources resident there. Although Georges Bank is identified as one of a number of special areas considered in the EIS, it is largely discussed more generally along with the other areas. The proponent's stochastic worst-case modeling estimates an up-to-30-percent chance of surface oiling thicker than 0.04 micrometres (the threshold for producing sheen) reaching George's Bank 30 to 42 days after a blowout.

Specific Question or Request: Describe more fully the potential effects of a worst-case spill scenario specifically on Georges Bank, including how these effects could affect commercial fishing on Georges Bank in the short-term and the long-term.

Current Use of Lands and Resources for Indigenous Traditional Purposes

IR 114 (MTI-40, MTI-41, MTI-46, MNNB-41, MNNB 46, MNNB-47)

Applicable CEAA 2012 effect(s): 5(1)(c)

EIS Guidelines Reference: Part 2, Sections 5.1 Aboriginal Groups to Engage & Engagement Activities, 6.1.3 Fish and Fish Habitat (baseline), 6.1.9 Aboriginal Peoples, 6.3.1 Fish and Fish Habitat (effects), 6.3.7 Aboriginal Peoples and 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: Appendix B (Traditional Use Study); 7.6 Commercial Fisheries; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes; 8.0 Accidental Events; Appendix I (Aboriginal Fishing Licences Information)

Context and Rationale: The Traditional Use Study (TUS) in Appendix B of the EIS was based on input provided by ten participating Mi'kmaq and Maliseet communities and the Native Council of Nova Scotia, and provides aggregated baseline information and assessment for:

- the Mi'kmaq of Nova Scotia, based on information provided by the communities of Acadia, Eskasoni, Pictou Landing, Glooscap, Membertou, Potlotek (Chapel Island) and Paq'tnekek;
- the Mi'gmaq and Wolastoqiyik (Maliseet) of New Brunswick, based on information provided by the New Brunswick Mi'gmaq community of Fort Folly and the New Brunswick Maliseet communities of St. Mary's and Woodstock; and
- the Native Council of Nova Scotia.

For these communities, the TUS includes aggregate information about species fished by TUS participants, times of year and whether those species occur in the PA, the LAA or RAA and therefore may be fished there. Appendix I of the EIS provides a list of licences held in the Gulf and Scotia-Fundy (Maritimes) DFO regions by Indigenous communities (both TUS participants and non-participants). Appendix I shows for which Northwest Atlantic Fisheries Organization (NAFO) fishing areas the licences are held, and species that may be fished with those licences. Appendix I also provides an overview of FSC fishing licencing data by location and Aboriginal organization.

Both the MNNB and the MTI expressed concern to the Agency about the completeness of the TUS and whether it adequately captures potential effects on their current use of lands and resources for traditional purposes and related effects on their communities' economies. The MNNB is concerned that there is not enough information provided in the EIS and TUS about their fishing activities to be able to fully understand the potential economic effects of a spill or other incident.

MTI expressed concern, from a socio-economic perspective, about an overall lack of information regarding New Brunswick Mi'gmaq First Nations with respect to assessing project-induced effects on MTI members and their Indigenous fishery. MTI is also concerned that effects on Indigenous lands and

resource use were only assessed on an aggregated basis, and expressed the view that effects on Indigenous traditional use need to be assessed and reported on an individual community basis and not on an aggregated basis. MTI noted that while there may be common elements to the activities, resources, and locations where individual Indigenous communities use lands and resources for traditional purposes, each community may be differently affected relative to the location of a proposed project. MTI noted that there are no maps in the EIS or TUS illustrating where fishing or other resource-based activities take place for New Brunswick Mi'gmaq First Nations, other than for Fort Folly. MTI recommended that the proponent re-engage and coordinate with MTI to acquire a more meaningful representative subset that more accurately reflects the full spectrum of the activities taking place by (multiple) New Brunswick Mi'gmaq First Nations, including fishing.

Based on the description of the NAFO fishing area provided in Appendix I, the Agency finds it difficult to discern whether communities that did not participate in TUS may fish in the PA, the LAA, or the RA, based on species occurrence in those areas, and therefore could be affected by the Project.

The Agency noted the TUS conclusion that landings, value and employment generated information was unavailable at the community level for TUS participants, but that, regardless, the TUS states that revenue generated from commercial fishing activities is an important contribution to the overall economy of Mi'kmaq communities. The TUS does not comment on the importance of commercial fishing revenue to the Maliseet.

To enable a better understanding of the full scope of potential effects of the Project on current use and socio-economic conditions, the Agency needs to know the full scope of communities that could be affected by the Project, at the community level and the relative importance of potentially-affected activities to these communities. This baseline information is necessary for the assessment of potential effects on current use for traditional purposes and socio-economic conditions, for example in the event of a large spill or blowout.

Specific Question or Request: For each of the communities listed below, augment the information provided in the EIS to include the following:

- information similar to that provided in sections 5.2 (Commercial Fisheries) and 5.3 (Food, Social and Ceremonial Fisheries) and 5.4 (Summary of Interviews Completed) of the TUS;
- summary tables of species fished, seasons of harvest, occurrence in the PA, LAA and RAA (e.g. similar to Table 7 of the TUS);
- a summary of fishing activity in each of the PA, LAA and RAA (similar to sections 5.4.1, 5.4.2 and 5.4.3 of the TUS).
- maps showing the locations where fishing activity is practiced for each of the groupings, similar to those provided in the TUS Appendices.
- a description of the relative importance of fishing activity to the socio-economic conditions of communities in that grouping; provide a quantitative description where feasible.

The communities are are:

- Nova Scotia Mi'kmaq communities of Millbrook, Sipekne'katik, Annapolis Valley, Bear River, Wagmatcook and We'koqmaq (Waycobah);

- New Brunswick Mi'gmaq communities of Bouctouche, Eel River Bar Esgenoôpetitj, Indian Island and Pabineau (Gulf Region);
- New Brunswick Maliseet communities of Kingsclear, Oromocto and Tobique;
- Prince Edward Island Mi'kmaq communities of Abegweit and Lennox Island; and
- The Newfoundland and Labrador community of Miawpukek.

This information can be provided in an updated TUS or as a stand-alone document. If included in an updated TUS, clearly indicate where in the updated TUS the information can be found. Where individual communities are unavailable or decline to provide information, please describe efforts to engage these groups and include relevant information in your response to this request.

In light of the information available (both in original EIS and new information arising from this information request), update the assessment of potential adverse effects of the Project on both current use of lands and resources for traditional purposes as well as on socio-economic conditions for the communities listed above. Include in the assessment adverse effects on fishing that may be caused by project-induced changes in the environment, including those due to accidents and malfunctions.

IR 115 (MTI-01)

Applicable CEAA 2012 effect(s): 5(1)(c); 5(1)(a)(i)

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat and Section 6.3.3 Marine Mammals

EIS Reference: 7.2 Fish and Fish Habitat; 7.3 Marine Mammals and Sea Turtles

Context and Rationale: MTI has raised a concern that there is limited assessment of the specific effects of underwater sound on behaviour or migration of fish and marine mammals in close proximity to fixed developments over the course of all drilling programs. In the EIS, underwater sound levels from the MODU were modelled to predict sound level propagation and to aid the effects assessment. The MODU will generate underwater sounds as a result of the dynamic positioning (DP) system and drilling activities. The DP system will employ thrusters to keep the MODU on location. These thrusters will generate underwater sound through vibration, and through the creation of low pressure points and bubbles known as cavitation; this is the primary mechanism for sounds produced by propellers and thrusters under higher speeds and loads (Leggat et al. 1981). Underwater sound will also be generated by drilling activities through mechanical vibration of the MODU and associated machinery located on the vessel. During drilling, the drill string and bit will also emit sound into the marine environment. The EIS recognizes that this noise will have an impact on marine life, but the specifics of the impact are vague. MTI recognizes that establishing a single sound-exposure criterion for marine fish to predict physical or behavioural changes is challenging, given the variation in sound characteristics from different types of sound sources and differences in how sound affects different species. The EIS applied general criteria for the acoustic modelling conducted for the Project, and suggested that, due to the transient nature of fish, physical injury effects on individual fish due to sound from MODU operation would be localized. However, there is limited assessment of the specific effects of sound from multiple wells on the behaviour or migration patterns of specific fish and marine mammal species that are important to

Mi'gmaq communities and their Indigenous fishery. Based on known physiology of these species and their ability to detect sound at certain distances, MTI has asked whether they will be significantly displaced by continuous sound emissions from all MODU operations.

Specific Question or Request: Although the EIS assesses effects on fish and fish habitat as a whole, assess the effects of underwater sound, from the drilling of multiple wells, considering thresholds for individual MTI culturally-significant or fished species to understand the effects on individuals and population behaviour and migration patterns. Species should include American Eel, Atlantic Sturgeon, Atlantic Bluefin Tuna, Herring and Gaspereau.

IR 116 (MTI-02)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat; 5(1)(c)(i) and (iii)

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat and 6.3.7 Aboriginal Peoples

EIS Reference: 7.2 Fish and Fish Habitat; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes

Context and Rationale: There is no analysis of the potential effects from underwater sound, waste disposal and spills on the migration and development of juvenile American Eel specifically. MTI has advised that American Eel has been a source of sustenance for the Mi'gmaq and is deeply integrated into the culture as a species with great spiritual significance. The species has been assessed as “threatened” by COSEWIC.

MTI advised that the entire population of juvenile American Eel destined for Atlantic Canadian rivers float through the Scotian Basin, in which area the Project would occur, and around Cape Breton before making their way into the Northumberland Strait. During this migration, they undergo a metamorphosis into the next life stage known as glass eel. This transformation occurs beyond the edge of the continental shelf, and close to the PA (COSEWIC, 2012). During this highly-sensitive life stage, eels are vulnerable to environmental change. MTI noted that although the EIS acknowledges that American Eel are found within the RAA, there is no analysis of the potential effects underwater sound, waste disposal and spills from the Project could have on the migration and development of juvenile American Eel, and how that could in turn affect the ability of the Mi'gmaq to practice traditional use of this resource.

Specific Question or Request: Assess the potential effects of the Project on American Eel, considering various life stages and all potential effects pathways (except underwater sound, which is addressed in IR 115). Discuss how project effects could act cumulatively with effects of other projects. Describe how changes in the environment due to the Project could affect Indigenous peoples' ability to practice traditional use of this resource.

IR 117 (MTI-03)

Applicable CEAA 2012 effect(s): 5(1)(c)(i) and (iii); 5(1)(a)(i)

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat and 6.3.7 Aboriginal Peoples

EIS Reference: 7.2 Fish and Fish Habitat; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes

Context and Rationale: MTI expressed concern about potential effects on sturgeon habitat during project operations. Atlantic Sturgeon has been assessed as “threatened” by COSWEC and is an important species to the Mi’gmaq that can be found throughout the coastal waters of the Maritimes and on the Scotian Shelf, generally concentrated in water depths less than 50 metres. MTI advised that adults migrate into estuaries and rivers in the autumn between August and October or in the spring between May and June prior to reproduction, and that adult Atlantic Sturgeon often overwinter in deep channels and pools in rivers and estuaries downstream of spawning sites. Adults and large juveniles move both inwards and seawards in response to season and salinity. They can be found in the Bay of Fundy, along the coast of Nova Scotia, and offshore as far as Banquereau and Sable Island Banks. Sturgeon prey on benthic organisms such as polychaetes (worms), shrimp, amphipods, isopods, gastropods and small fish (sand lance) (COSEWIC, 2011). MTI noted that the EIS addresses the potential for oil spills to affect sturgeon habitat, but there is no analysis of the potential effects of project operations on sturgeon habitat, specifically within the corridor to be used by platform supply vessels (PSVs) to and from the MODU. MTI has expressed concern that increased vessel traffic, waste disposal, potential reduction in sediment and water quality, and underwater sound in shallower waters may affect benthic habitat for sturgeon prey species, disrupting overall sturgeon food supply and habitat.

Specific Question or Request: Further to the general assessment of effects on fish and fish habitat that was presented in the EIS, assess the potential effects of the Project specifically on Atlantic Sturgeon habitat within the LAA, particularly in water depths of 50 metres or less. Consider potential effects of increased vessel traffic on benthic invertebrates and their habitat in which Atlantic Sturgeon feed. Describe how potential changes in the environment due to the Project could affect Indigenous peoples’ ability to practice traditional use of this resource.

IR 118 (MTI-04)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat; 5(1)(c)(i) and (iii)

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat and 6.3.7 Aboriginal Peoples

EIS Reference: 7.2 Fish and Fish Habitat; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes

Context and Rationale: MTI expressed concern that there is limited information on how the underwater sound from operations and increased vessel traffic may affect salmon migration and movement. Atlantic Salmon, an important species for MTI, make long oceanic migrations from May to November from their overwintering at-sea locations to their native freshwater streams (COSEWIC 2010a). As stated in the EIS, there are 4 distinct populations that may occur in the vicinity of the PA:

- Outer Bay of Fundy Population (assessed by COSEWIC as Endangered);
- Inner Bay of Fundy Population (listed in SARA Schedule 1 as Endangered);
- Eastern Cape Breton Population (assessed by COSEWIC as Endangered); and

- Nova Scotia Southern Upland Population (assessed by COSEWIC as Endangered).

The EIS states that all populations, except for the Inner Bay of Fundy Population, are expected to occur within the PA but will be transient in nature, but does not assess how underwater sound from operations and increased vessel traffic may affect Atlantic Salmon migration and movement throughout the RAA.

Specific Question or Request: Further to the assessment of effects on fish and fish habitat in the EIS assess the potential effects of underwater noise from operations and vessel traffic specifically on migration and movement of the three Atlantic Salmon populations expected to occur in the PA. Describe how potential changes in the environment due to the Project could affect Indigenous peoples' ability to practice traditional use of this resource.

IR 119 (MTI-05)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat; 5(1)(c)(i) and (iii)

EIS Guidelines Reference: Part 2, Sections 6.3.1 Fish and Fish Habitat and 6.3.7 Aboriginal Peoples

EIS Reference: 7.2 Fish and Fish Habitat; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes

Context and Rationale: MTI is concerned about the effect of underwater sound on the movement of Atlantic Herring, a culturally-important species for the Mi'gmaq and an important commercial fishery in the PA. Once profuse along the Atlantic Coast, herring spawning areas are now relatively scarce. Coastal spawning areas include areas off southwest Nova Scotia as well as in the Bay of Fundy and off Grand Manan Island.

Specific Question or Request: Assess the potential effects of underwater sound from the Project specifically on Atlantic Herring, including potential effects on movement of Atlantic Herring populations throughout the RAA, taking into account applicable sound thresholds of Atlantic Herring. Describe if and how this assessment of Atlantic Herring alters the assessment of effects on Indigenous peoples in the EIS, including potential effects on the Indigenous fishery or other traditional uses of this resource.

IR 120 (MNNB-05)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) Fish and Fish Habitat; 5(1)(a)(ii) Aquatic Species; 5(1)(c) Effect of a change in the environment on Aboriginal peoples

EIS Guidelines Reference: Part 2, Section 6.3.1 Fish and Fish Habitat and Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: EIS Section 5.2.5 Marine Fish pp. 5.110-5.111; Section 8.5.5 Commercial Fisheries pp. 8.136; Appendix G, Fig. 18, pp 18

Context and Rationale: MNNB advised the Agency that Atlantic Bluefin Tuna is an important species for which fisheries are located primarily inshore and within shallower water along the Scotian Shelf, with landings of other tuna species predominantly located further offshore beyond the Scotian Slope. There were landings reported for all tuna species from along the edge of the Scotian Shelf. The MNNB acknowledged that, given the relatively low landings reported from the PA, direct effects from the Project appear likely be minimal, but nonetheless expressed concern that tuna may avoid the PA during drilling operations. Concern was also expressed that a major accident affecting the LAA or RAA could cause fish to avoid the area, and possible bioaccumulation of contaminants in fish. Oil and dispersants are most toxic to larval fish, and adult tuna are very mobile, so while the effects of even a major spill would probably be less severe for tuna than for resident and spawning fish, the MNNB noted that Bluefin Tuna populations are declining and show high inter-connectivity. MNNB is concerned that a major spill or blowout scenario could have unforeseen severe consequences to this species meta-population (Block et al. 2001) and noted that migration patterns and ecology are also not fully understood, complicating the understanding of adverse effects from a major spill or blowout (Richardson et al. 2016).

Specific Question or Request:

- a) Assess the potential effects of the Project specifically on Atlantic Bluefin Tuna, including the potential for them to avoid the PA during normal operations or to avoid spill-affected areas.
- b) Consider the potential for bioaccumulation of contaminants in Atlantic Bluefin Tuna as a result of a spill or response measure (e.g. dispersants). Describe if and how this assessment of Bluefin Tuna alters the assessment of effects on Indigenous peoples in the EIS, including potential effects on the Indigenous fishery or other traditional uses of this resource.
- c) Indicate whether the proponent would review future Atlantic Bluefin Tuna migration research and update Environmental Management and Monitoring Plans within an adaptive management context for protection of this species, if applicable.

IR 121 (MTI-11, MTI-12)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat; 5(1)(c)(i) and (iii)

EIS Guidelines Reference: Part 2, Section 6.3.1 Fish and Fish Habitat

EIS Reference: 7.2 Fish and Fish Habitat

Context and Rationale: MTI has commented to the Agency that more assessment of effects on benthic habitat from the release of drilling mud is required. The EIS describes the environmental effects of releasing drilling waste and mud disposal as mostly restricted to smothering of sessile or slow moving individuals and sedimentation. These effects are said to be negligible and reversible; MTI commented that the extent of the effects from loss or destruction of benthic habitat, and not just individuals in that habitat, is not adequately assessed. MTI is concerned about long-term effects and recommended that a reclamation plan be developed.

MTI has also expressed concern about the limited mitigation planned for the effects of waste disposal to fish and fisheries. The combined effects of discharge of drill muds and cuttings with sedimentation and localized changes in water quality are stated to interact with fisheries species within a localized area, thereby potentially affecting availability of fisheries resources or causing a change in traditional use for Indigenous fisheries. Limited mitigation is proposed in the EIS regarding the reversal of degraded sediment quality and water quality from discharge of drilling materials.

Specific Question or Request:

- a) Describe proposed benthic habitat rehabilitation following well abandonment, or provide a rationale for why this is not proposed.
- b) Identify if there are technically and economically-feasible measures that could reduce the benthic area affected by the drilling waste.
- c) Discuss the potential for long-term effects from water and sediment quality degradation as a result of waste disposal on various life functions and migratory routes of important commercial fisheries species and the associated potential for effects on Indigenous traditional use.

IR 122 (MNNB-44)

Applicable CEAA 2012 effect(s): 5(1)(c)

EIS Guidelines Reference: Part 2, Section 6.1.9 Aboriginal Peoples; Part 2, Section 6.3.7 Aboriginal Peoples

EIS Reference: 5.3.6 Aboriginal Fisheries; 6.2.2 Selection of Valued Components; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes

Context and Rationale: MNNB has advised the Agency that the EIS does not address the nature and vulnerability of local economies or reliance on “country foods”, taking into consideration the potential for effects of the Project (e.g. potential contamination).

The EIS discusses the commercial and FSC fisheries in some detail (EIS, Section 5.3.6.2, page 5.262; Traditional Use Study), but says nothing about the extent to which Indigenous communities rely on “country food.” Socio-economic effects arising from a change in the environment must be considered in a federal environmental assessment, and are mentioned in the Guidelines, but the proponent has explicitly excluded socio-economic conditions as VCs (EIS, Table 6.2.1, p. 6.17). Thus, it is not possible to predict the effects of any degree of environmental change on the local or regional economies of Indigenous communities associated with effects on country food.

Specific Question or Request:

- a) Provide a discussion of First Nations’ reliance on country food and how this could be affected by the Project, or explain why it is not discussed in the EIS. This can either be included in an updated TUS or provided as a separate response. If included in the TUS, clearly indicate where in the document it has been addressed.

- b) Discuss how changes in the environment that may be caused by the Project, particularly due to accidents or malfunctions such as a blowout, could affect the health of Indigenous peoples, including secondary socio-economic aspects as described above.

IR 123 (MTI-43)

Applicable CEAA 2012 effect(s): 5(1)(c)

EIS Guidelines Reference: Part 1, Section 3.3.2 Valued Components to be Examined; Part 2, Sections 5 Aboriginal Engagement and Concerns, 6.1.9 Aboriginal Peoples and 6.3.7 Aboriginal Peoples

EIS Reference: Various – see context

Context and Rationale: MTI commented to the Agency that there was a lack of information presented in the EIS pertaining to contemporary resource-based livelihood (e.g. eco-tourism and other recreational activities). This may include eco-tourism or other recreational operations. These socio-economic components are described in general as they occur off the southeastern shores of Nova Scotia, however not with respect to other areas in, or in proximity to, the RAA that may have implications for New Brunswick Mi'gmaq First Nations.

Specific Question or Request: Considering the comments above, discuss the Project's potential effects on socio-economic conditions (including eco-tourism and recreation) of the New Brunswick Mi'gmaq First Nations (as represented by MTI).

IR 124 (MTI-44)

Applicable CEAA 2012 effect(s): 5(1)(c)(i) and (iii)

EIS Guidelines Reference: Part 2, 6.1.9 Aboriginal Peoples and 6.3.7 Aboriginal Peoples

EIS Reference: 5.3 Socio-Economic Environment; 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes

Context and Rationale: The MNNB notes that the assessment of effects on Indigenous peoples focuses on "Current Aboriginal Use of Lands and Resources for Traditional Purposes". MTI has advised the Agency that this valued component focus is too narrow and does not adequately reflect the values of Mi'gmaq First Nations in New Brunswick. Of interest and value is not only "current use" but linkages between past, current and future use of the lands and resources through a seven-generation approach to sustainability that aligns with Mi'gmaq environmental management practices and stewardship for Indigenous fishery and fisheries species harvested offshore or nearshore, particularly migratory species.

Specific Question or Request: Explain if and how the analysis of the significance of potential adverse environmental effects on current Indigenous use of lands and resources for traditional purposes includes consideration of elements of the Mi'gmaq seven-generation approach to sustainability.

IR 125 (MTI-45)

Applicable CEAA 2012 effect(s): 5 (1)(c)(i))

EIS Guidelines Reference: 6.3.11 Human Environment

EIS Reference: 6.2.2 Selection of Valued Components

Context and Rationale: MTI has expressed concern to the Agency that the RAA does not extend far enough west and northwest, into the Gulf of Maine and Bay of Fundy, to fully understand the potential effects on Aboriginal ocean resource use and the Indigenous fishery under normal project conditions as well as accidental event (spill) scenarios.

Specific Question or Request: Further to providing the rationale for the spatial scope of the cumulative effects assessment for each valued component (IR 004), discuss whether extending the spatial scope of the RAA to encompass Aboriginal ocean resource use and the Indigenous fishery in the Gulf of Maine and Bay of Fundy could change the analysis of potential effects on Aboriginal culture, health and socio-economic conditions and current use of lands and resources for traditional purposes.

IR 126

Applicable CEAA 2012 effect(s): 5(1)(c)(iii)

EIS Guidelines Reference:

EIS Reference: 7.7.8.2 Mitigation of Project-Related Environmental Effects

Context and Rationale: The proponent commits to developing and implementing a Fisheries Communication Plan for Indigenous fisheries representatives that will facilitate coordinated communication around routine Project activities and components as well as accidental events.

Specific Question or Request: Describe the objective of the Fisheries Communication Plan and how the proponent intends to work with Indigenous groups whose current use (i.e. fishing) may be affected by the Project to ensure their input is received and considered throughout the Project.

Accidents and Malfunctions

IR 127 (MNNB-01)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) Fish and Fish Habitat; 5(1)(a)(ii) Aquatic Species; 5(1)(c) Effect of a change in the environment on Indigenous peoples

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 5.2.5 Marine Fish pp. 5.111-5.112; 8.5.1 Fish and Fish Habitat pp. 8.92

Context and Rationale: The MNNB noted that Atlantic Salmon is an important species for the food social and ceremonial (FSC) fishery for Indigenous groups, particularly the MNNB. Maliseet communities do not have FSC allocations for salmon as the stocks are too low on the Saint John River, where the Atlantic

Salmon fishery has been closed since 1996. The MNNB has advised that any future effects on Atlantic Salmon with the potential to further deplete the stocks are of great concern, as they are culturally important and have been part of the Maliseet diet since time immemorial.

The MNNB noted that Atlantic Salmon migrate through the LAA and the RAA and may migrate through the PA, and that several populations of Atlantic Salmon have been assessed as Endangered or Threatened by COSEWIC, or are SARA- listed, with high marine mortality being a key reason for their status. The Endangered (COSEWIC) Outer Bay of Fundy population is also known by the MNNB to migrate through the LAA and RAA, and likely the PA. Although the EIS assesses effects on fish and fish habitat collectively, and lists Atlantic Salmon as a species occurring in the area, potential adverse effects from Project activities and accidents specifically on Atlantic Salmon are not described.

Specific Question or Request:

- a) Provide information on how the different accident scenarios (including scale, temporal and spatial issues) could affect, specifically, migratory and transient species that depend on the LAA and RAA as migratory routes between breeding and feeding areas, with particular focus on Atlantic Salmon.
- b) Provide information on how any subsequent changes to fish migratory behaviour due to a spill incident could affect Indigenous fishing, particularly for FSC purposes.

IR 128 (MNNB-02)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: EIS Section 8.3.3.3 Oil Spill Tactical Response Methods

Context and Rationale: The MNNB noted that one of the proposed mitigation strategies for controlling a spill is the use of dispersants, pursuant to a Net Environmental Benefit Analysis (NEBA) being performed. The primary benefits of dispersant use are stated to be that they remove hydrocarbons from the water surface where they may harm seabirds and other wildlife, and they can be rapidly deployed over wide areas. The EIS provides a discussion on the benefits of dispersant use and suggests that risks are minimal.

The MNNB has noted that several recent studies on the effects of the Deepwater Horizon oil spill suggest that common dispersants used in spill scenarios make hydrocarbons more bioavailable, and have suggested links to health risks in humans and aquatic animals. Links between dispersant use and deformities, bioaccumulation, as well as direct mortality of aquatic life have been identified and are the subject of active research (e.g. Almeda et al 2013; Barron 2012; Goodbody et al. 2013; Paul et al. 2013; Rico-Martinez et al. 2013). Furthermore, the MNNB is concerned that dispersants may prolong exposure to hydrocarbons as the dispersed hydrocarbons become suspended in the water column or fall to the sediment on the sea floor and interfere with the ability of bacteria to degrade hydrocarbons (Hamdan and Fulmer, 2011; Kujawinski et al. 2011).

Specific Question or Request: Further to IR 073 that requests a more complete description of potential adverse effects of dispersant use on VCs and IR 066 that asks how dispersant use would affect fate of spilled oil:

- a) provide a list of dispersants that may be used, along with any reported evidence of the observed environmental effects associated with their use;
- b) provide the parameters that would be considered in the NEBA, including potential environmental effects on aquatic organisms due to both oil and dispersants; and
- c) based on current science, including from the Deepwater Horizon oil spill, provide an analysis of how the potential effects of dispersant use on aquatic organisms could in turn affect FSC, commercial, and recreational fisheries.

IR 130 (MNNB-04)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) Fish and Fish Habitat; 5(1)(a)(ii) Aquatic Species; 5(1)(c) Effect of a change in the environment on Indigenous peoples

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: BP Scotian Basin Exploration Drilling Project EIS Section 8.5.5 Commercial Fisheries pp. 8.136

Context and Rationale: MNNB has advised that, in addition to fish mortality, diminished fish reproduction, and loss of fish habitat, one of the long-term consequences of the Deepwater Horizon oil spill was a decrease in consumer confidence in seafood from the Gulf of Mexico. The MNNB stated that a majority of consumers perceived that fish and shellfish from the Gulf of Mexico were unsafe to eat even three years after the event, even though studies showed that this seafood had low toxicity (McKendree et al. 2013). The MNNB is concerned that a large oil spill from the Project could have severe economic consequences to Indigenous recreational, FSC and commercial fisheries and associated industries.

Specific Question or Request: Based on the modelled accident scenarios in the EIS, estimate possible economic effects on Indigenous peoples both from recreational and Indigenous fisheries closures that could result from a spill, and from to reduced consumer confidence in seafood from the affected area. In conducting this analysis, consider research or other information from the Deepwater Horizon oil spill, such as *Environmental effects of the Deepwater Horizon oil spill: A review* (Beyer et al 2016) and *Louisiana residents' self-reported lack of information following the Deepwater Horizon oil spill: Effects on seafood consumption and risk perception* (Simon-Friedt et al 2016).

IR 131 (MNNB-06)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) Fish and Fish Habitat; 5(1)(a)(ii) Aquatic Species; 5(1)(c) Effect of a change in the environment on Indigenous peoples

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: EIS, Section 5.2.5 Marine Fish pp. 5.100; Section 8.5.5 Commercial Fisheries pp. 8.136; Appendix G, Fig. 21, pp 21

Context and Rationale: The MNNB noted that Swordfish landings are heavily concentrated along the edge of the Scotian Shelf, but there are also consistent landings throughout the Scotian Shelf, including in the PA. Because most landings occur outside of the PA, the MNNB acknowledged that direct effects from the Project are likely to be relatively low, although Swordfish may avoid the PA during project operations. A major accident affecting the LAA or RAA could cause Swordfish avoiding the area, and possible bioaccumulation of contaminants. The MNNR submission stated that oil and dispersants are most toxic to larval fish, which are not present in the RAA, and the adults are very mobile, so while the MNNB acknowledge that even a major spill may not cause population-level effects, the migration patterns of Swordfish are not well understood (Abascal et al. 2015, Neilson et al. 2014, Schirripa et al. 2016), and thus the potential effects on this species are difficult to ascertain.

Specific Question or Request:

- a) Assess the potential short and long-term effects of potential spills and remediation efforts (e.g. use of dispersants) on Swordfish, including potential effects on the health and sustainability of the species and consider potential for effects on human health (i.e. bioaccumulation). Describe if this assessment of effects on Swordfish alters the assessment of effects on Aboriginal peoples, including potential effects on the Indigenous fishery or other traditional use of this resource.
- b) Indicate whether the proponent would review future Swordfish migration research and update Environmental Management and Monitoring Plans within an adaptive management context for protection of this species, if applicable.

IR 132 (MNNB-07)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) Fish and Fish Habitat; 5(1)(a)(ii) Aquatic Species; 5(1)(c) Effect of a change in the environment on Indigenous peoples

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: EIS Section 5.2.5 Marine Fish pp. 5.95; Section 8.5.5 Commercial Fisheries pp. 8.136; EIS Appendix G, Fig. 15, pp 15

Context and Rationale: The MNNB is concerned about the Silver Hake, a commercially harvested species. The MNNB has identified that Silver Hake spawn in the RAA, and is thus concerned that the species may be at greater risk than pelagic and transitory species. MNNB is concerned that a major spill or blow-out could have local and regional effects on adults and pelagic larvae.

Specific Question or Request: Assess the potential short and long-term effects of potential spills and remediation efforts (e.g. use of dispersants) on Silver Hake, including the health and sustainability of the population and potential human health (i.e. bioaccumulation) effects. Describe if and how these potential effects would alter any assessment of effects on Aboriginal peoples, including potential effects on the Indigenous fishery or other traditional use of this resource.

IR 133 (MTI-14)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.3 Emergency Response and Spill Management

Context and Rationale: MTI has noted that, in line with standard practices, the proponent will submit various plans at a later date as part of the CNSOPB's authorization process, including an Incident Management Plan, a Spill Response Plan, an Environmental Protection Plan, and a Safety Plan. Thus, MTI is not able to evaluate the adequacy of these documents at this time.

Specific Question or Request: Further to IR 063, which requests outlines of the Incident Management Plan, Spill Response Plan, Environmental Protection Plan, and Safety Plan, along with key commitments, state whether the proponent intends to provide MTI or other groups with an opportunity to review or provide input to these plans before they are finalized.

IR 134 (MTI-15)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.1 Potential Accidental Events; 8.1.3.1 Offshore Vessel Collision; 8.2 Potential Spill Scenarios

Context and Rationale: The EIS notes that an offshore vessel collision could result in an oil spill. The MTI noted that no probability is provided for the likelihood of such a collision and the consequent likelihood of a resulting spill.

Specific Question or Request: Estimate the probability of an offshore vessel collision and the likelihood of a spill should a collision occur, based on past incidence of such events and considering project-specific characteristics.

IR 135 (MTI-16)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.1 Potential Accidental Events; 8.2 Potential Spill Scenarios

Context and Rationale: MTI is concerned that the probability of a spill is greater now that wells are being drilled in deeper water. The EIS stated that the probability of a blowout incident is 3.1×10^{-4} per well drilled (or 2×10^{-3} if seven wells are drilled; data from 1980 to 2004). It also stated that there are more controls in place now compared to the time period of the data upon which the probability estimates are based. MTI is concerned that, that despite the relatively low probability of occurrence, the

risk may be understated, given the potential severity of environmental effects of a blowout. Further, the 1980 to 2004 time period does not include the Deepwater Horizon oil spill that occurred in 2010.

Specific Question or Request: Provide a discussion of how project-specific characteristics may affect the likelihood of a well blowout. State whether the wells that would be drilled as part of the Project would be in water depths greater than those typically drilled over the time period used to develop the probability of a blowout (1980 to 2004). State whether wells in deeper waters pose a greater risk of blowouts.

IR 136 (MTI-18)

Applicable CEEA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.1 Potential Accidental Events; 8.2 Potential Spill Scenarios

Context and Rationale: Two oil volumes were modelled to represent a bulk spill of diesel from the MODU: 10 barrels and 100 barrels. MTI has advised that the 100-barrel volume used to represent the higher end of the range, in MTI's view, is too low. Figure 8.2.3 shows that 18 percent of spills from U.S. offshore platforms were of volumes between 100 and 999 barrels for the years 1968 to 2012.

Specific Question or Request: Provide a rationale for why a 100-barrel spill size was used for the spill modelling. Discuss how the results of that modelling would differ for a 1,000-barrel spill, and how that would affect the resulting effects to VCs.

IR 137 (MTI-21, MTI-22)

Applicable CEEA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.3 Emergency Response and Spill Management

Context and Rationale: In the event of a spill, the EIS states that booming and skimming may be employed to limit the spread of oil and to partially recover the oil, but does not provide further detail. In particular, the EIS does not discuss how much equipment is available for spill response, whether or not it is enough to respond adequately to a large spill, or equipment locations and estimated deployment times. Without this information, MTI is unable to determine the extent to which booming and skimming may serve as useful mitigation measures.

Specific Question or Request: Describe, to the extent known:

- where spill response equipment would be stored,
- whether there would be enough equipment (e.g. number and capacity of skimmers, length of boom, deployment vessels, etc.) to respond effectively to a large spill or blowout,
- plans to get spill response equipment to the spill site, and

- the estimated time to get equipment to an oiled shoreline.

The response should consider the predicted time for oil to reach shorelines (e.g. 3.8 days to Sable Island for one blowout scenario).

IR 138 (MTI 23)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: Various – See context

Context and Rationale: The EIS says that the proponent has addressed all 26 recommendations from its internal investigation of the Deepwater Horizon oil spill (as documented in the Bly Report; Table 8.3.3). MTI noted that it is not clear how the Bly Report recommendations relate to recommendations made by independent commissions, such as the Deepwater Horizon Study Group formed by members of the Center for Catastrophic Risk Management Deepwater Horizon Study Group (2011) and the National Academy of Engineering and the National Research Council (Marine Board 2012). Some of those recommendations may help reduce either the probability of a blowout, or its consequences.

Specific Question or Request: Explain the extent to which the proponent’s procedures for accidents and malfunctions for the Project have been updated to address recommendations from independent commissions, including those named above.

IR 139 (MTI-26)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.4 Spill Fate and Behaviour; Appendix H Oil Spill Trajectory Modelling

Context and Rationale: MTI has asked what assumptions were used to develop the assumed flow rates of a well blowout for the purpose of oil spill modeling (24,890 barrels per day and 35,914 barrels per day). The flow rate determines the volume of oil released and is therefore a key assumption in oil spill modelling.

Specific Question or Request: Further to IR 062, which requests clarification of why a declining flow rate was used, state the assumptions used to generate the estimated flow rates for oil spill modelling and how they were verified as being appropriate. For context, discuss how the model flow rates compare to flow rates experienced during the Deepwater Horizon oil spill and explain any differences.

IR 140 (MTI-27)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.4 Spill Fate and Behaviour; Appendix H Oil Spill Trajectory Modelling

Context and Rationale: The spill model scenarios assume a release duration of 30 days, a time period that is slightly more conservative than the upper limit of 25 days assumed for the time to cap the well. Oil flowed from the Deepwater Horizon (Macondo) well for 87 days, considerably longer than the 30-day assumption used by the proponent. MTI understands that during the Deepwater Horizon oil spill, multiple capping attempts were required, and a relief well was ultimately needed to stop the flow of oil. The proponent assumes that a relief well could be drilled in 165 days, but this estimate is not used in the spill model scenarios.

Specific Question or Request: Clarify for how many days oil flowed from the well after the Deepwater Horizon oil spill. Explain how 30 days of flow was chosen as the worst-case oil spill scenario for the Project in light of that duration. Re-run the oil spill model using a more conservative approach taking into consideration the Deepwater Horizon oil spill, or provide a rationale of why this is not warranted.

IR 141 (MTI-28)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.4 Spill Fate and Behaviour; Appendix H Oil Spill Trajectory Modelling

Context and Rationale: The oil spill model used meteorological and oceanographic data from January 2006 to December 2010. MTI expressed concern that this period may not be long enough to reflect extreme weather events.

Specific Question or Request: Provide justification that the use of the 2006 to 2010 data set accurately reflects extreme weather events. Discuss whether using data for a longer time period could substantially affect model results. If yes, re-run the model or, alternatively, explain why this would not change the assessment of effects.

IR 142 (MTI-29 and MTI-30)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.4 Spill Fate and Behaviour; Appendix H Oil Spill Trajectory Modelling

Context and Rationale: For the oil spill modelling, properties of the crude oil were predicted and then matched to the best fit in the Hydrocarbon Processing Industry (HPI) database (1987). The best fit was found to be Sture Blend. Oil weathering data and other oil properties were also derived from the HPI (1987). Please clarify whether this database has been updated since 1987. MTI noted that considerable

research has been conducted on oil weathering since 1987. If oil is encountered during the Project, it may have different properties than the Sture Blend.

Specific Question or Request: Explain the sensitivity of the oil model to differences in various oil properties, such as weathering, pour point, viscosity, and specific gravity. Explain how the proponent ensured that the most appropriate oil weathering properties were input to the model.

IR 143 (MTI-32)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.4 Spill Fate and Behaviour; Appendix H Oil Spill Trajectory Modelling

Context and Rationale: MTI advised that the 58 ppb TPH threshold used to estimate adverse effects on biological resources in the water column is not specific to oil type and is therefore not a credible threshold. In MTI's view, this threshold also does not adequately account for the significantly greater toxicity of diesel as compared to crude oil. The 100-barrel deterministic diesel batch spill scenario indicates that 336 square kilometres would have water column TPH concentrations exceeding 1 ppb. MTI is concerned that, depending on the biological effects threshold used, contamination of an area this large could result in significant mortality to water column resources and cause long-term effects on marine life.

Specific Question or Request: Further to IR 069, indicate if the 58 ppb effects threshold is applicable to diesel. If not, provide an appropriate effects threshold for diesel and conduct additional analysis, if required, to determine the areas where the threshold would be exceeded. Describe how this could affect predictions of environmental effects from diesel spills

IR 144 (MTI-33)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: For a well blowout, the maximum predicted oiling on the shoreline of the Sable Island National Park Reserve is 669 tonnes of oil along 79.5 kilometres of shoreline. MTI has expressed concern about the effects of this oiling and noted that for isolated areas such as Sable Island, recruitment of flora and fauna may be limited, which may limit recovery time.

Specific Question or Request: Provide a discussion of expected recovery time of potentially-oiled shoreline resources on Sable Island in the event of the worst case scenario described above. Cite current literature as appropriate.

IR 145 (MTI-34)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: MTI is concerned that the toxicity of SBM to marine fauna may not have been adequately considered in the context of the SBM spill scenario. The evaluation of effects focuses on smothering (as well as a cursory consideration of turbidity).

Specific Question or Request: Describe the possible toxic effects of SBM on marine fauna. Discuss the degradation properties of SBM in the context of the effects on benthic habitat, which were predicted in the EIS to be “temporary” and “reversible”.

IR 146 (MTI-35)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: MTI observed that references are not provided for many statements in the EIS regarding anticipated effects of a spill on marine and coastal life, making it difficult to verify the accuracy of the statements. Examples include the statement that zooplankton may be able to avoid exposure to oil, but those which cannot, will depurate (p. 8.99), as well as the statement that the fish community is likely to re-establish itself within one generation following a blow-out (p. 8.99).

Specific Question or Request: Indicate whether the examples stated above are supported by scientific research, or are based on professional judgement.

IR 147 (MTI-36)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: MTI has expressed concern that the anticipated effects of a well blowout may be underestimated in the EIS. Many studies were conducted following the Deepwater Horizon oil spill to assess effects on biological resources, including studies conducted by the Deepwater Horizon natural resource trustees for the natural resource damage assessment (NRDA; in many cases, in cooperation with the proponent) that are summarized in the Programmatic Damage Assessment and Restoration Plan (PDARP) and Programmatic Environmental Impact Statement (PEIS) (Deepwater Horizon Trustees, 2016).

Specific Question or Request: In conjunction with IR 137 (which focuses recommendations that arose from the Deepwater Horizon oil spill), comment on whether and if so, how, the findings of biological effects from that incident, including those presented in the PDARP, were taken into account in determining the anticipated Project effects.

IR 148 (MTI-37)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: In the event of a well blowout, the magnitude of adverse effects on fish and fish habitat is characterized as moderate. The natural resource damage assessment for the Deepwater Horizon oil spill estimated that trillions of planktonic invertebrates and larval fish were killed in offshore waters alone (Deepwater Horizon Trustees, 2016, p. 4-202). While fish and invertebrate populations were expected to recover, MTI considers this to be a high-magnitude effect and has expressed concern about a possible similar scale of injury from a well blowout during the Project.

Specific Question or Request: Further to IR 061, which discusses significance criteria ratings for blowout scenarios, comment on whether information from the Deepwater Horizon PDARP-PEIS was considered in evaluating the magnitude of potential effects of the Project on fish and fish habitat.

IR 149 (MTI-38)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: MTI has expressed concern that potential effects on cetaceans from a well blowout may be underestimated. Natural resource trustees for the Deepwater Horizon oil spill found that bottlenose dolphins suffered a loss of 30,347 lost cetacean years due to the spill. Without active restoration, the population was estimated to take 39 years to recover (Deepwater Horizon Trustees, 2016, p. 4-618).

Specific Question or Request: Further to IR 061 and IR 148, which also discuss significance criteria ratings for blowout scenarios, indicate if the discussion of anticipated effects of a well blowout on cetaceans considered the Deepwater Horizon NRDA finding referenced above. Reconcile the “short-term to medium-term” duration rating for effects of a large-scale blowout on marine mammals and sea turtles (Table 8.5.2) with the above-reported results and update the effects prediction, if appropriate.

IR 150 (MTI-039)

Applicable CEAA 2012 effect(s): 5(1)(a)(i) fish and fish habitat

EIS Guidelines Reference: Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions

EIS Reference: 8.5 Environmental Effects Assessment

Context and Rationale: Effects of a well blowout on the sponge and coral conservation areas are estimated to be minimal because the oil would mostly be limited to the surface and mixed layer of the water column. MTI commented that deep sea corals were reported to have been adversely affected by the Deepwater Horizon oil spill (PDARP).

Specific Question or Request: Explain whether the effects of the Deepwater Horizon oil spill on deep sea corals were considered in the assessment of effects of a large-scale blowout on sponge and coral conservation areas and provide specific references of the studies that were considered in the EIS. If effects on sponges and corals from the Project are expected to be minimal, explain how that determination was reached in light of the similarities or differences between a project blowout and the Deepwater Horizon oil spill.

IR 151 (SPANS-01)

Applicable CEAA 2012 effect(s):

EIS Guidelines Reference:

EIS Reference:

Context and Rationale: SPANS has advised the Agency that it is aware of work that is taking place to develop and integrate the Net Environmental Benefits Analysis (NEBA) model into the accidental spill response toolkit of oil and gas exploratory drilling proponents including for the Project. SPANS has commented to the Agency that the NEBA development initiative, along with its implication for approval of dispersants, should be the subject of further follow up and consultation with all stakeholders.

Specific Question or Request: Describe if and how the proponent intends to involve stakeholders, including commercial fishers (Indigenous and non-Indigenous), in the development of the NEBA for this Project.

IR 152 (SFN-02)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: 6.6.1 Effects of potential accidents or malfunctions

EIS Reference: EIS Summary, Section 2.5.3 Emergency Response and Spill Management, page 13

Context and Rationale: The EIS states that “BP will work with a number of local and federal government bodies in the event of an oil spill. These government bodies would be notified of a spill event, engaged

to support response efforts and provide regulatory oversight as required.” The proponent of another recent exploration drilling project in Nova Scotia conducted an emergency response planning exercise in order to prepare for a well-coordinated response in the event of an environmental emergency.

Specific Question or Request: Indicate whether an emergency response exercise is planned to be carried out before the Scotian Basin drilling program is started and, if not, why. If an exercise is planned, indicate what agencies would be involved in the exercise and whether the fishing community or Indigenous peoples would be invited to participate, as participants or observers, and if so, which communities or groups.

IR 153 (ECCC-21, SFN-03, MTI-19)

Applicable CEAA 2012 effect(s): All

EIS Guidelines Reference: 6.4

EIS Reference: 8.3.3.2

Context and Rationale: The EIS Guidelines (section 6.4) require the EIS to indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of various forms of mitigation are to be justified.

Section 8.3.3.2 of the proponent’s EIS states that: “BP has contributed to the provision of industry capping stacks, and along with other operators in industry, continues to refine and enhance the deployment of capping stacks being developed today.” “For Scotian Basin wells, BP’s current primary plan is to access the capping stack stored in Stavanger, Norway...”. “While it is preferred that the cap is transported directly to the well site on-board a vessel with suitable deployment capabilities, it may become necessary to make an intermediate port call in St. John’s (Newfoundland and Labrador) or Halifax. If this were to become necessary, the required customs clearances, functional checks, cargo transfers, etc. could add several days to the overall transit time.” “Allowing for these uncertainties, BP estimates that a well could be capped between 13 and 25 days after an incident.”

It is not clear if other means were considered for getting a capping stack to the scene of a blowout more quickly. The Agency has also heard concerns about this from Indigenous groups (e.g. MTI, Nova Scotia Mi’kmaq). MTI recommended that a capping stack be located in Eastern Canada.

Specific Question or Request:

- a) Discuss the economic and technical feasibility of options for decreasing capping stack response times, taking into consideration: the potential to use other capping stacks (e.g. from organizations other than the Oil Spill Response Limited organization or private companies), establishing a capping stack facility in eastern Canada, or having a capping stack available on a vessel for rapid deployment.
- b) The EIS states that it may become necessary to make an intermediate port call in St. John’s or Halifax - explain if steps could be taken in advance to avoid a time-consuming port call in the event that a capping stack is required.

- c) Clarify the assumptions used to develop the estimate that a well could be capped between 13 and 25 days after an incident and what allowances have been made for weather conditions such as extreme weather events or typical yearly storms. Discuss if weather could delay arrival beyond the estimated 19-day maximum transportation time? Describe any other circumstances (e.g. damaged wellhead or BOP) that could impede installation of a capping stack. Estimate the probability that capping stack installation could not be achieved within the 30 days used to model blowout fate and effects.

Follow-Up and Monitoring

IR 154 (MNNB-45, MNNB-49, MTI-47, MTI-49)

Applicable CEAA 2012 effect(s): 5(2)(b)

EIS Guidelines Reference: Part 2, Section 8 Follow-up and Monitoring Programs

EIS Reference: Section 7.6 Commercial Fisheries; Section 7.7 Current Aboriginal Use of Lands and Resources for Traditional Purposes; Section 12.0 Environmental Management and Monitoring

Context and Rationale: The EIS Guidelines require the proponent to set out a follow-up program for “as long as required for the environment to regain its equilibrium and to evaluate the effectiveness of the mitigation measures.” Among other things, the follow-up program provides an “opportunity for the proponent to take advantage of the participation of Aboriginal groups...during the implementation of the program” (EIS Guidelines, Section 8.1, pages 32-33).

In the EIS, the proponent has not proposed follow-up and monitoring for the Project’s potential effects on Indigenous current use of lands and resources for traditional purposes: “Given the high level of confidence around a prediction of no significant adverse environmental effects on Current Aboriginal Use of Lands and Resources for Traditional Purposes, and the implementation of standard mitigation, no follow-up and monitoring is proposed to be implemented for routine Project activities” (EIS, Section 7.7.10, page 7.145). Similarly, no follow-up monitoring is proposed for Commercial Fisheries, including Indigenous fisheries (EIS, section 7.6.10, page 7.131).

MTI has also expressed concern to the Agency that consultation or Indigenous knowledge study protocols for New Brunswick Mi’gmaq First Nations were not used to support the EIS and baseline information may therefore be incomplete. The EIS refers to the *Proponent’s Guide: The Role of Proponents in Crown Consultation with the Mi’kmaq of Nova Scotia* (NSOAA 2012) and the *Mi’kmaq Ecological Knowledge Study Protocol* (Assembly of Nova Scotia Mi’kmaq Chiefs 2007)” and states that there is an absence of such protocols in New Brunswick. MTI advised the Agency that it made the proponent aware of the *New Brunswick Mi’gmaq Indigenous Knowledge Study Process Guide* and that not having used that Guide, in MTI’s view, has affected scoping, consultation, and studies needed to determine effects on Mi’gmaq of New Brunswick First Nations that fished in the past, currently fish, and have interests in fishing and other resource based socio-economic activities (e.g. guiding; eco-tourism; other business operations) within or in proximity to the RAA. MTI expressed the view that this could increase the uncertainty of the analysis in the EIS. MTI stated that it finds it unacceptable that no follow

up or monitoring is to be implemented for potential effects on Indigenous fishery and other current Indigenous use of lands and resources for traditional purposes. Similarly, the MNNB stated that predictions and mitigation success need to be confirmed and adjusted as needed through a follow-up program with regular meetings to verify EIS predictions and, depending on the findings, adjust mitigation measures accordingly.

Specific Question or Request: Further to IR 085, which requests additional information about the follow-up program, and in conjunction with IR 114 that seeks baseline information about Indigenous fishing activity, provide information regarding a potential follow-up program to monitor effects on the current use of lands and resources for traditional purposes and on Indigenous commercial fisheries. Either describe a proposed follow-up program or provide additional rationale as to why it is not deemed necessary.

In providing a response, consider:

- effects on both the current use of lands and resources for traditional purposes and Indigenous commercial fisheries;
- how inclusion of the guidance in the *New Brunswick Mi'gmaq Indigenous Knowledge Study Process Guide* could affect the potential effects described in the EIS, and the certainty of that assessment;
- if and how Indigenous groups would be consulted about the effects of the Project on the current use of lands and resources for traditional purposes, and on Indigenous commercial fisheries, for all project phases through a follow-up program, or other mechanisms. For example, would the proponent be willing to work collaboratively with First Nations to create a follow-up program, including meeting regularly with captains to verify EIS predictions and, depending on the findings, adjust mitigation measures accordingly?; and
- how the accuracy of predictions would be monitored with respect to potential effects on the current use of lands and resources for traditional purposes and Indigenous commercial fisheries, as a result of a change in the environment caused by the Project.

Also clarify how a qualitative assessment would be used to measure changes in catch rates, as is stated in the EIS (Table 7.7.1). Discuss the extent to which reported fish landings or other quantitative data could be used to measure changes in catch rates.

References

- Abascal, F.J., Mejuto, M., Quintans, B., Garcia-Cortés, and Ramos-Cartelle, A. 2015. Tracking of the broadbill swordfish , *Xiphias gladius*, in the central and eastern North Atlantic. *Fisheries Research*, 162:220-28.
- Almeda, R., Wambaugh, Z., Wang, Z., Hyatt, C., Liu, Z., and Buskey, E.J. (2013). Interactions between zooplankton and crude oil: toxic effects and bioaccumulation of polycyclic aromatic hydrocarbons. *PLoS one*, 8(6):e67212.
- Barron, M.G. (2012). Ecological impacts of the Deepwater Horizon oil spill: implications for immunotoxicity. *Toxicity pathology*, 40(2):315-320.
- Beebe, W. (1935). Rediscovery of the Bermuda cahow. *Bulletin of the New York Zoological Society*, 38: 137-190.
- Beyer, J., Trannum, H.C., Bakke, T., Hodson, P.V., and Collier, T.K. 2016. Environmental effects of the Deepwater Horizon oil spill: A review. *Marine Pollution Bulletin*, 110:28-51.
- BirdLife International. (2016) various seabird species accounts IUCN Red List of Threatened Species. Version 2016.2. International Union for Conservation of Nature.
- Block, B.A., Dewar, H., Blackwell, S.B., Williams, T.D., Prince, E.D., Farwell, C.J., Boustany, A., Teo, S.L., Seitz, A., and Walli, A. (2001). Migratory movememnts, depth preferneeces, and thermal biology of Atlantic Bluefin tuna. *Science*, 293:1310-1314
- Brooke, M. (2004). Albatrosses and petrels across the world. *Oxford University Press*, Oxford.
- Deepwater Horizon Trustees. 2016. Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement.
- Dick and Donaldson. (1978). Fishing vessel endangered by Crested Auklet landings. *Condor*, 80:235-236.
- Force, M. (2014) Personal communication with Maliseet Nation of New Brunswick.
- Goodbody-Gringley, G., Wetzel, D.L., Gillon, D., Pulster. E., Miller, A., and Ritchie, K.B. (2013). Toxicity of Deepwater Horizon source oil and the chemical dispersant, Corexit® 9500, to coral larvae. *PLoS one*, (8)1:e45574.
- Hamdan, L.J., and Fulmer, P.A. (2011). Effects of COREXIT ® EC9500A on bacteria from a beach oiled by the Deepwater Horizon spill. *Aquatic microbial ecology*, 63(2):101-109.
- Howell, S.N.G. (2012). Petrels, albatrosses and storm-petrels of North America. *Princeton University Press*, Princeton NJ and Oxford, UK.
- Kujawinski E.B., Kido Soule, M.C., Valentine, D.L., Boysen, A.K., Longnecker, K., and Redmond, M.C. (2011). Fate of dispersants associated with the Deepwater Horizon oil spill. *Environmental science & technology*, 45(4):1298-1306.
- Le Corre, M., Ollivier, A., Ribes, S.B., and Jouventin, P. (2002). Light-induced mortality of petrels : a 4 year study from Réunion Island (Indian Ocean). *Biological Conservation*, 95:93-102 et al. 2002.

- Lee, D.S. (2000). Status and conservation priorities for Black-capped Petrel in the West Indies. In: Schreiber, E.A.; Lee, D.S. (ed.), Status and conservation of West Indian seabirds, pp. 11-18. *Society for Caribbean Ornithology*, Los Angeles.
- Leggat, L. J., Merklinger, H. M., & Kennedy, J. L. (1981). *LNG Carrier underwater noise study for Baffin Bay* (No. DREA-81/3). Defence Research Establishment Atlantic Dartmouth (Nova Scotia).
- Lewis, S., Sherratt, T.N., Hamer, K.C., and Wanless, S. (2001) Evidence of intra-specific competition for food in a pelagic seabird. *Nature*, 412:816-819.
- Mactavish, B. 2003. Personal communication with Maliseet Nation of New Brunswick.
- Marine Board. (2012). Macondo Well Deepwater Horizon Blowout: Lessons Improving Offshore Drilling Safety. *National Academies Press*.
- McKendree, M.G., Ortega, D.L., Widmar, N.O., and Wang, H.H. (2013). Consumer perceptions of seafood industries in the wake of the Deepwater Horizon oil spill and Fukushima Daiichi nuclear disaster (No 155582). Michigan State University, Department of Agricultural, Food, and Resource Economics.
- Merkel, F.R., and Johansen, K.L. (2011). Light-induced bird strikes on vessels in Southwest Greenland. *Marine Pollution Bulletin*, 62:2330-2336.
- Neilson J.D., Loefer, J., Prince, E.D., Royer, F., Calmettes, B., et al. (2014). Seasonal distributions and migrations of northwest Atlantic swordfish : Inferences from integration of pop-up satellite archival tagging studies. *PLoS ONE* 9(11):e112736.
- OLF [Norwegian Oil Industry Association]. 2008. Guideline for risk assessment of effects on fish from acute oil pollution. The Norwegian Oil Industry Association. Norway
- Paul, J.H et al. (2013). Toxicity and mutagenicity of Gulf of Mexico waters during and after the Deepwater Horizon Oil Spill. *Environmental Science & Technology*, 47(17):9651-9659.
- Reed, J.R., Sincock, J.L., and Hailman, J.P. (1985). Light attraction in endangered procellariiform birds: reduction by shielding upward radiation. *Auk*, 102:377-383.
- Richardson D.E., Marancik, K.E., Guyon, J.R., Lutcavage M.E., Galuardi, B., Lam, C.H., Walsh, H.J., Wildes, S., Yates, D.A., and Hare, J.A. (2016). Discovery of spawning ground reveals diverse migration strategies in Atlantic Bluefin tuna (*Thunnus thynnus*). *Proceedings of the National Academy of Sciences* 113:3299-3304.
- Rico-Martinez, R., Snell, T.W., and Shearer, T.L. (2013). Synergistic toxicity of Macondo crude oil and dispersant Corexit 9500A® to the *Brachionus plicatilis* species complex (Rotifera). *Environmental Pollution*, 173:5-10.
- Rodríguez, A., and Rodríguez, B. (2009). Attraction of petrels to artificial lights in the Canary Islands: effects of the moon phase and age class. *Ibis*, 151:299-310.

- Rodríguez, A., Rodríguez, B., and Lucas, M.P. (2012). Trends in numbers of petrels attracted to artificial lights suggest population declines in Tenerife, Canary Islands. *Ibis*, 154(1):167-172.
- Rodríguez, A., Burgan, G., Dann, P., Jessop, R., Negro, J.J., and Chiaradia, A. (2014). Fata attraction of short-tailed shearwaters to artificial lights. *PLoS ONE*, 9(10):e110114.
- Roule, S. (2010). Distribution and status of the manx shearwater (*Puffinus puffinus*) on islands near the Burin Peninsula, Newfoundland. B.Sc Thesis. Memorial University of Newfoundland. 38 pp.
- Saether, B.E., and Bakke, O. (2000). Avian life history variation and contribution of demographic traits to the population growth rate. *Ecology*, 81:642-653.
- Schirripa, M.F., Abascal, F., Andrushchenko, I., Diaz, G., Mejuto, J., Ortiz, M., Santos, M., and Walkter, J., (2016). A hypothesis of a redistribution of North Atlantic swordfish based on changing ocean conditions. Deep Sea Research Part II: Tropical Studies in Oceanography
- Simon-Friedt, B.R., Howard, J.L., Wilson, M.J., Gauthé, D., Bogen, D., Nguyen, D., Frahm, E., and Wickliffe, J.K. 2016. Louisiana residents self-reported lack of information following the Deepwater Horizon oil spill: Effects on seafood consumption and risk perception. *J Environ Manage*, 180:526-537.
- Telfer, T.C., Sincock, J.L., Bryd, G.V., and Reed, J.R. (1987). Attracting of Hawaiian seabirds to lights: conservation efforts and effects of moon phase. *Wildlife Society Bulletin*, 15:406-413.
- Thompson. (2013). Effects of ships lights on fish, squid and seabirds. *NIWA Environmental Science*, Wellington New Zealand 15pp.
- Wiese, F.K., Montevecchi, W.A., Davoren, G.K., Huettmann, F., Diamond, A.W., and Linke, J., (2001). Seabirds at risk around offshore oil platforms in the northwest Atlantic. *Marine Pollution Bulletin*, 42:1285-1290.

Appendix A - CEAA 2012 Environmental Effects

5 (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are

(a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:

- (i) fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*,
- (ii) aquatic species as defined in subsection 2(1) of the *Species at Risk Act*,
- (iii) migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*, and
- (iv) any other component of the environment that is set out in Schedule 2;

(b) a change that may be caused to the environment that would occur

- (i) on federal lands,
- (ii) in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, or
- (iii) outside Canada; and

(c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on

- (i) health and socio-economic conditions,
- (ii) physical and cultural heritage,
- (iii) the current use of lands and resources for traditional purposes, or
- (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

5 (2) However, if the carrying out of the physical activity, the designated project or the project requires a federal authority to exercise a power or perform a duty or function conferred on it under any Act of Parliament other than this Act, the following environmental effects are also to be taken into account:

(a) a change, other than those referred to in paragraphs (1)(a) and (b), that may be caused to the environment and that is directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of the physical activity, the designated project or the project; and

(b) an effect, other than those referred to in paragraph (1)(c), of any change referred to in paragraph (a) on

- (i) health and socio-economic conditions,
- (ii) physical and cultural heritage, or
- (iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.