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Ms. Elizabeth MacDonald
 Environment, Canada-Nova Scotia Offshore Petroleum Board
 6th Floor, TD Centre
 1791 Barrington Street
 Halifax, NS B3J 3K9

75,345.7.6

Dear Ms. MacDonald:

**RE: DFO Maritimes Region Comments on the Canada-Nova Scotia
 Offshore Petroleum Board Draft Strategic Environmental Assessment
 Reports for the Western Scotian Shelf and Slope Phase 3A and 3B**

This letter outlines comments of Fisheries and Oceans Canada (DFO), Maritimes Region, on the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB – the Board) draft Strategic Environmental Assessment (SEA) reports for the Western Scotian Shelf (Area 3A) and Western Scotian Slope (Area 3B). In this review, DFO notes that the intent of the two SEA reports is to identify the potential environment-offshore petroleum activity interactions and associated mitigation requirements that may exist and need to be considered with respect to future offshore petroleum exploration and development activities. Further, the SEA reports will be used as a primary basis for scoping and defining the parameters of subsequent project and activity-specific reviews pursuant to the Board's environmental management and review process.

To date, DFO has contributed to this SEA process by providing comments on the scope for the SEAs and facilitating access to DFO data holdings for improved mapping and more accurate representations of the ecosystem and human use in the area. We note as well that detailed comments were provided on the previous SEA reports completed in 2013 for Misaine and Banquereau Banks (Area 2A) and Eastern Scotian Slope and Laurentian Fan (Area 2B), as well as the 2012 SEA reports for the Eastern Scotian Shelf (Area 1A) and Slope (Area 1B). Notwithstanding the comments contained in this review, it is recommended that DFO's comments on these other reports also be consulted for their application, as appropriate. DFO's review was coordinated by Ecosystem Management and included input from Ocean and Ecosystems Science, Fisheries and Aquaculture Management, and Policy and Economics.

In general, DFO finds the SEA reports to be well-organized and structured in relation to SEA requirements. However, DFO's review of the documents did identify several important issues related to the department's mandate that require further attention. The key issues and associated gaps identified through the review are described in this letter, as well as in the detailed list of the comments attached to this letter. DFO recommends that these comments be acknowledged and addressed to the greatest degree possible so that the final SEA reports can perform their function as the basis for scoping and defining the parameters for future exploratory and development activities.

In particular, DFO highlights the following issues in relation to the SEA reports as requiring additional or improved information, description and/or consideration:

Application of Statement of Canadian Practice: Portions of the marine area and certain species encompassed by the SEA reports present the type of circumstances envisioned by the Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP) as requiring enhanced treatment and consideration of additional mitigation measures. The detailed comments identify specific areas where enhanced measures may or will be required. It is important to emphasize that the SOCP sets out minimum acceptable standards and measures only.

North Atlantic right whale critical habitat: The study area for Phase 3A overlaps with identified critical habitat in Roseway Basin for the *Species at Risk Act* (SARA) listed (Endangered) North Atlantic right whale. Roseway Basin is an important area for feeding and socializing, and right whales are generally most abundant in this area between summer and fall. The attached detailed comments include a map of North Atlantic right whale sightings that should be included in the report.

Other cetaceans: In addition to the North Atlantic right whale, the study area is important for other species of special status under SARA, such as the blue whale (Endangered), fin whale (Special Concern), northern bottlenose whale (Endangered), and Sowerby's beaked whale (Special Concern). As noted above, enhanced mitigation beyond the SOCP for these species will be required. DFO notes that its forthcoming science review on mitigation and monitoring measures for SARA listed whale species will provide additional information and knowledge for future activity assessments.

Sea turtles: The study areas for 3A and 3B overlap with important areas identified for the SARA listed (Endangered) leatherback sea turtle and the loggerhead turtle, which is assessed as endangered by COSEWIC and is currently being evaluated by DFO for listing under SARA. The study areas are highly important to the biology of leatherback and loggerhead turtles. DFO notes that the SEAs do not provide an adequate treatment of these turtle species, particularly in terms of their distribution, use of the area, and appropriate mitigation methods. Details on gaps and inaccuracies are provided in the appended comments.

Commercial, recreational and Aboriginal fisheries: The SEA reports provide a reasonable amount of information and level of detail on commercial, recreational and Aboriginal fisheries in Areas 3A and 3B. DFO notes that these areas are important for a number of fisheries, including large pelagics, groundfish, and offshore lobster. The study area also overlaps with several important fishing banks, such as Browns Bank and Georges Bank. The SEA reports should provide more recent, publicly available information on the location and distribution of important habitats, including spawning areas, for commercial, Aboriginal and recreational fish species in the study area. As noted in the detailed comments, it is important that the SEAs place an emphasis and provide direction on the need to avoid and/or minimize negative interactions with the fisheries in the area, particularly those related to productivity, important life stages and biological processes, fleet access, and catch rates. DFO also notes that the fisheries protection provisions under the *Fisheries Act* not only include fish that are directly harvested, but also fish that support commercial, recreational and Aboriginal fisheries.

Determination of significant and cumulative effects: DFO views the purpose of the SEA reports to identify and discuss potential interactions, associated effects, and mitigation options for minimizing impacts. The SEAs should also provide information around the reliability and limitations of known mitigation measures. This is useful for providing the “state of the art” knowledge for the area to assist in scoping future activity-specific assessments. As noted in the comments around the application of the SOCP, the SEAs do not include a complete or exhaustive list of mitigation and monitoring requirements, particularly around species of special status, and additional mitigation measures beyond those listed in these reports may be required. As such, it is important to avoid definitive statements around significance of effects. Instead, the SEAs should be used to demonstrate that sufficient information and knowledge exists to enable the appropriate scope and focus for determining effects at the activity-specific level.

With respect to cumulative effects, the SEA reports note that it is difficult to do more than identify the potential interactions and associated effects at the strategic level. That said, it is important that the SEAs note the potential for cumulative effects for the area given that there is potential for multiple seismic and exploratory drilling programs in conjunction with existing, expanding or other new ocean uses, as well as environmental stressors associated with climate and environmental changes. As above, this strategic level information can then be used to properly scope future assessments to more accurately predict the cumulative effects at the project level. DFO cautions against making determinations that cumulative effects are not likely to be significant based on the level of information available at the SEA phase.

In closing, DFO would like to thank the Board for the opportunity to review and provide comments on the SEA reports. DFO recognizes the importance of preparing comprehensive and authoritative SEAs to guide project-specific reviews and future exploration activities. DFO also notes that a number of the above-noted issues are being addressed through its ongoing collaborative work with the Board to define appropriate

protection, mitigation and monitoring measures for the special areas and species identified through the SEA process for offshore Nova Scotia. This collaborative work is consistent with the intent of our shared Memorandum of Understanding and associated annual workplan activities. This work will both serve to improve clarity around expectations for future exploration activities and enhance environmental safeguards for this important marine area.

If you have any questions or concerns regarding DFO's review and comments, please do not hesitate to contact Glen Herbert at a time convenient to you by telephone, 902-426-9900, or by email, glen.herbert@dfo-mpo.gc.ca.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'D. Millar', written over a horizontal line.

David Millar
Regional Director
Ecosystem Management
Maritimes Region

Attachment

cc: Frank Quinn
Tim Hall
Mark McLean
Marci Penney

Comments applicable to both reports (Western Scotian Shelf and Slope) are as follows (page numbers refer to Phase 3A document):

(NOTE: Suggest additions to text are in **bold lettering** and suggested deletions are in ~~strike-through red lettering~~. As both reports are being covered, page number references may be specific to one report and slightly off from the companion report.)

Executive Summary, P.E.2: The Fisheries VEC should be expanded to include all fish species that support commercial, recreational and Aboriginal fisheries to be consistent with the fisheries protection measures under the *Fisheries Act*.

Executive Summary, Table E.1, P.E.2: Summary of Key Mitigation for Exploration Activities:

Seismic and Seabed Surveys: “Schedule surveying to minimize interaction with peak spawning in the Haddock Box (April to May).” The Haddock Box should only be included here as an example. The mitigation measure to minimize interaction with peak spawning times should apply to all species. This also applies elsewhere in the document, see Table 5.2.

“Enhanced mitigation may be required for seismic surveys, such as the 30 minute required observation period outlined in the SOCP will be extended to 60 minutes ~~if beaked whales are observed at the surface prior to ramp-up.~~” In areas where beaked whales are likely to occur, an extended observation period is required as they spend long periods of time (60-70 minutes) below the surface. As such, the observation should be extended even if whales are not observed in the first 30 minutes. This also applies elsewhere in the document, see Table 5.1.

Exploratory Drilling: “Areas with known aggregations of cold water corals and **other sensitive features.**” This also applies elsewhere in the document, see sections 5.2.1.1 and 9.0.

“Enhanced mitigation and EEM programs may be required for activities within or adjacent to special areas, such as **spawning areas (e.g., Haddock Box)**...”

Well abandonment: The planned mitigation for use of explosives is incomplete. Mitigation is required beyond interaction with marine mammals and turtles.

Executive Summary, P.E.5: “Assuming adherence to applicable standards and regulations and the implementation of mitigation and monitoring as recommended, exploration activities are not expected to result in unacceptable adverse environmental effects (including cumulative effects) such that population of species of special status or the integrity of special areas would be compromised.” and “...environmental effects on fisheries are also not expected to result in unacceptable effects provided implementation of recommended mitigation and ongoing communication with fishery stakeholders.”

DFO notes that the SEA does not include a complete/exhaustive list of mitigation and monitoring requirements, particularly around species of special status, and additional mitigation requirements beyond those listed in the SEA may be required. As such, the above

statements are potentially misleading and could indicate to proponents that applying mitigation outlined in the SEA is all that is required. It should be amended to reference the potential requirement for additional or alternative mitigation measures at the project level. This also applies to section 9.0.

1.0 Introduction, P.1.1: Third paragraph should reference other *Fisheries Act* closures, such as LFA 40 and the Browns Bank groundfish closure.

2.1 Regulatory Context, P.2.1: “~~Although typically authorizations are not required from these other federal agencies~~ for exploration projects, legislation and regulatory guidance administered by these departments are taken into consideration during environmental assessment where applicable.” DFO reviews each proposed project individually subject to applicable legislation, so to state “authorizations typically are not required” may establish an incorrect sense of expectation by industry.

2.1 Regulatory Context, Table 2.1, P.2.3: Under the “Statement of Practice for Seismic ...”, the list of regulatory authorities is also supported by other federal and provincial partners (see: <http://www.dfo-mpo.gc.ca/oceans/management-gestion/integratedmanagement-gestionintegree/seismic-sismique/index-eng.asp>).

2.1 Regulatory Context, Table 2.1, P.2.4: Under the “*Species at Risk Act*”, Section 32 of SARA should be summarized in the table. At a minimum, “No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated, endangered or threatened species” should be added to the text.

2.2 Generic description of routine oil and gas exploration activities, Table 2.2, P.2.7: The “Key environmental issues” part of the table should include the physical interaction of the seismic ship and gear with marine mammals. Vessel collisions are mentioned in Table 2.5 in relation to increased supply vessels, but there is no mention of vessel-marine mammal interactions during seismic surveys.

2.3.4 Oil Spill Prevention and Response, P.2.21: “Spill response can include any combination of the following methods: Chemical dispersion (usually applied before the bulk of the spill is widely dispersed; requires authorization from Environment Canada prior to application).” The work by Fraser (1989) (refer to method 3 related to Canadian recommendation of dispersant use) may help to understand the decision-making process pertaining to dispersant(s) recommendations and identify guidelines on their use as a consideration for authorization.

3.1.1 Oceanography, P.3.1: “refer to figure 3.1” This should be figure 3.2.

3.1.1 Oceanography, P.3.1-3.2: “Further to the South, on the Western Scotian Shelf...” and “The movement of water on Georges Bank ...” These two paragraphs are repeated three times. Delete repeated paragraphs. Also page numbers 3.1 and 3.2 are repeated.

3.1.1 Oceanography, P.3.1: The Shelf Break Current ~~is~~ **has** the largest ~~east~~ transport ~~feeder~~ ~~en~~ along the Eastern Scotian Shelf (Han and Loder 2003).

3.1.1 Oceanography, P.3.4: The density of seawater depends on ~~a few factors including~~ temperature, salinity and pressure. There are no other factors beyond the three already named.

3.1.1 Oceanography, P.3.5: “The lowest dissolved oxygen levels can be found within the deepest basins in the area (Worcester and Parker 2010).” This statement should be verified, Oxygen concentration is highly temperature dependent and for this region, it is related to the source water (e.g., Gulf Stream, Labrador Current). The warm salinity water found in the basin sometimes have low oxygen levels since the source is modified Gulf Stream water.

3.1.2 Climatology, P.3.5: “North Atlantic Oscillation (NAO).” The acronym is formed incorrectly. Correction needs to be made throughout the document.

3.1.2 Climatology, Table 3.2 P.3.8: Change “Minimum Wave Height” to “Minimum Significant Wave Height”

3.1.2 Climatology, Table 3.2 P.3.8: Change “Maximum Wave Height” to “Maximum Significant Wave Height”

3.1.2 Climatology, Table 3.2 P.3.8: Change “Mean Wave Height” to “Mean Significant Wave Height”

3.1.3 Summary, Table 3.8, P.3.15: “The water temperatures found in the Western Scotian Shelf and the Gulf of Maine are **among** the most variable in the North Atlantic Ocean.”

3.2.1.1 Phytoplankton, P.3.16: “On the Scotian Shelf diatoms and dinoflagellates **are generally the forms with the largest cell size** and they are the most **commonly recognized types in the phytoplankton.**”

3.2.1.1 Phytoplankton, P.3.16: “Their abundance is based on the **balance between growth and mortality, which may be strongly influenced by** the complex physical oceanographic features of the Shelf.”

3.2.1.1 Phytoplankton, P.3.16: “During the winter months, the ~~surface~~ waters are mixed **upwards** by passing storms, increasing the amount of nutrients in the ~~water-surface~~ **layer.**”

3.2.1.1 Phytoplankton, P.3.17: “The structure and composition of the phytoplankton community has not been described in detail for the Scotian Shelf area ...” This is not a true statement. The biological diversity of the phytoplankton community in the wider Gulf of Maine Area, which includes the western Scotian Shelf has been described on the basis of morphological taxonomy (Li et al. 2011). Diatoms and dinoflagellates are the most taxon rich groups in these waters, but cyanobacteria as well as 18 other classes of microalgae also occur here. The cells of these many taxa are variously distributed in size classes according to accepted nomenclature: picoplankton, nanoplankton, and microplankton.

Reference: Li, W.K.W. et al. 2011. Planktonic microbes in the Gulf of Maine Area. PLoS ONE 6(6):e20981doi:10.1371/journal.pone.0020981

3.2.1.2 Zooplankton, P.3.19: “Three species of copepods ~~known as~~ of the genus *Calanus* comprise over 70% of the copepod biomass.”

3.2.1.2 Zooplankton, P.3.19: “can be influenced by large-scale ~~elimate~~ processes such as the ~~variation on changes in~~ circulation ~~related to the North Atlantic Oscillation.~~”

3.2.1.3 Ichthyoplankton, P.3.20: “Eastern Nova Scotian Shelf” should be “Scotian Shelf”.

3.2.1.3 Ichthyoplankton, P.3.20: “High biomasses ~~has been found~~ of various ichthyoplankton communities ~~have been found~~ on Emerald and Western Banks during the spring and summer (Breeze et al 2002).”

3.2.1.3 Ichthyoplankton, P.3.20: “Georges Bank plays an important role in the early stages of a variety of ~~species that are targets of~~ commercially important fisheries (DFO 2011a).”

3.2.2 Algal Communities, P.3.20: Macrophytic algae and seaweeds are not native inhabitants in the SEA Study Area of the Scotian Shelf and Slope, nor even on the submerged banks. The light requirement of substrate-attached algae restrict their distribution to much shallower inshore habitats.

Bacterial Communities - The SEA has no section on heterotrophic bacteria. This is a serious first-order gap in the SEA because bacteria are natural microbial agents that remediate hydrocarbon contamination in ocean waters.

Possible information sources:

- Yeung et al. 2010. *Can. J. Microbiol.* 56 :421-431
- Yeung et al. 2011. *Mar. Poll. Bull.* 62 :2095-2105
- Li et al. 2011. *PLoS ONE op. cit.*

3.2.4 Commerical Fish and Invertebrates, P.3.26: The document does not provide an adequate description of the pelagic fishes and is inaccurate regarding the distribution and seasonality of pelagic fishes. The descriptions are so general that it would be difficult to come to any conclusion about the interaction of the proposed activity and the fish.

3.2.4 Commerical Fish and Invertebrates, Table 3.13, P.3.27: Herring are missing from the table and are generally not mentioned in this section. What are the criteria for identifying “principal” commercial fisheries? Herring should be included here. Also there are no directed fisheries for mako and white marlin. Jonah crab could also be included.

3.2.4 Commerical Fish and Invertebrates, Table 3.14, P.3.29: Two types of mackerel listed, these are the same species.

3.2.4.1 Pelagic Fish, Table 3.14, P. 3.29: Blue shark: Blue sharks do not mate on the continental shelf. However, they are common on the shelf, including the study area, between June and October (Campana et al. 2006). This entry needs to be rewritten.

3.2.4.1 Pelagic Fish, Table 3.14, P. 3.30: Porbeagle: Porbeagles are seldom found with blue sharks, since they prefer colder water. But they are common in the study area (Campana et al. 2012). This entry needs to be rewritten.

3.2.4.2 Groundfish, Table 3.15, P.3.30-3.31: Some of the distributional information seems dated. More recent distribution information can be found in Clark and Emberley (2011). Minor updates are provided below.

Clark, D.S. and Emberley, J. 2011. Update of the 2010 summer Scotian Shelf and Bay of Fundy research vessel survey. Can. Data Rep. Fish. Aquat. Sci. 1238.

Redfish: Biomass peaks in Roseway Basin

Atlantic Halibut: While adult halibut are common along the shelf edge, the majority of the halibut found on the western Scotian Shelf are on the banks and in depths less than 200m.

Monkfish: Most common at depths greater than 100m.

Silver Hake: Found throughout the study area, migrating from shelf edge in winter onto the banks and into coastal areas in summer.

3.2.4.3 Shellfish, Table 3.16, P.3.32: Indicates that Iceland scallops can be found on Browns Bank in Scallop Fishing Area 26. This is misleading because if there are any Iceland scallops there, they are few and very far between and not part of the commercial fishery.

3.2.4.4 Fish Species of Special Status, P.3.36: Basking Sharks: Basking sharks are common in the Emerald Basin in June, and may mate there (Campana et al. 2008). This entry needs to be rewritten.

3.2.4.4 Fish Species of Special Status, Table 3.17, P.3.37:

Spiny Dogfish: Spiny dogfish are believed to mate and give birth along the edge of the Scotian Shelf, including in the study area, in spring (Campana et al. 2009). This entry needs to be rewritten.

Species missing from the table: White Hake- COSEWIC designation Threatened

All COSEWIC assessed species are under consideration for SARA listing, and having certain species labelled "under consideration" is misleading. For Porbeagle shark and Winter skate, the decision was made to not list these species so having "not listed" for these two species is correct.

All references on sharks available at:

<http://www.marinebiodiversity.ca/shark/english/publications.htm>

3.2.5 Marine Mammals and Sea Turtles, P.3.39: Data caveats should be referenced as "Fisheries and Oceans Canada (2013)" and not "pers comm. G.Oldford."

3.2.5.1 Mysticetes and Odontocetes, Table 3.18, P.3.40-3.42: The last column

doesn't actually indicate low/medium/high potential for occurrence for these species as is done in other tables in this section. The potential for occurrence within the study areas for most of these species is likely high.

For Sowerby's beaked whales, it is stated that "There have been no reported sightings of Sowerby's beaked whale within the Study Area." This statement is not true – DFO are currently collecting sightings of Sowerby's beaked whales for the species Management Plan, and there is a clear concentration of Sowerby's sightings within the Study Areas (see Figure 2 below). Sowerby's beaked whale has a COSEWIC designation of Special Concern.

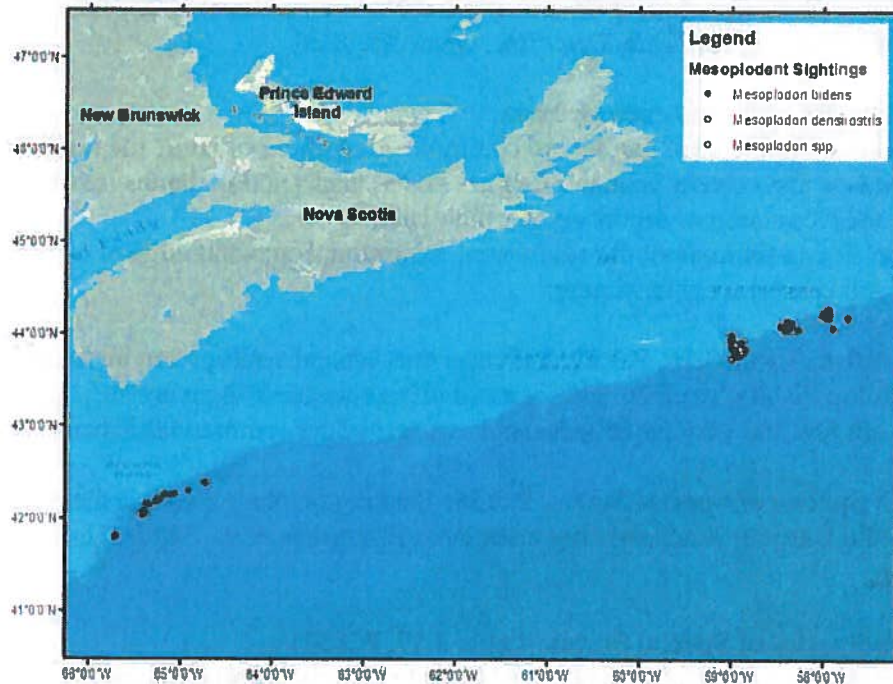


Figure 2. Sightings of Sowerby's beaked whales and other Mesoplodon sightings in the Scotian Shelf area, collected from various sources including the DFO Maritimes Region cetacean sightings database and the Whitehead Lab of Dalhousie University. Figure does not yet include sightings from NOAA surveys or the North Atlantic Right Whale Consortium database.

The section on marine mammals draws heavily upon the Scotian Shelf overviews presented in Davis et al (1998) and CNSOPB (2001). The sub-regional source material that informs both of those overviews should have been more fully incorporated in this section. Recent sightings data, survey reports, distribution maps and stock assessments are available from the (<http://www.nmfs.noaa.gov/pr/sars/species.htm>) indicate that beaked whales such as Blaineville, Gervais and Cuviers are likely to occur in the Study Area.

Other sources that should be reviewed include:

- Referenced material and maps in Breeze et. al. (2002)
- United States National Marine Fisheries Service This body of knowledge appears to have been overlooked. NMFS has made a large number of transects extending into Canadian waters. For example, in 1993, a sighting survey was conducted between the 200 and 2,000m isobaths from the southern edge of Georges Bank, across the Northeast Channel to the south eastern edge of the Scotian Shelf (Anon 1993; Waring et al 2002).

- Whitehead and Wimmer (2002) report observations of several species in waters south of Browns Bank.

3.2.5.1 Mysticetes and Odontocetes, Figure 3.12, P.3.44: The sightings presented are marine mammal and sea turtle sightings that have been collected by DFO from various sources, but do not represent all of the sightings data that exists for the various species in this general area. As an example, the DFO sightings database only contains a small portion of North Atlantic right whale sightings, as the majority of these are held in the North Atlantic right whale Consortium's database (see Figure 1 below). The fact that the maps provided do not include all known sightings of the various species in the study area is an important caveat to note, as some of the maps presented are missing some of the available data (e.g., compare Figure 1 here to Figure 3.12 in the SEA). This is important given that some statements, such as "there have been no reported sightings of this species in the study area" are made based on the data within these maps and may not actually be true as not all sources of data have actually been examined (see note about the Sowerby's beaked whale).

Figure 3.12 should be replaced with a figure that more accurately represents the distribution of the North Atlantic right whale in the Study Area.

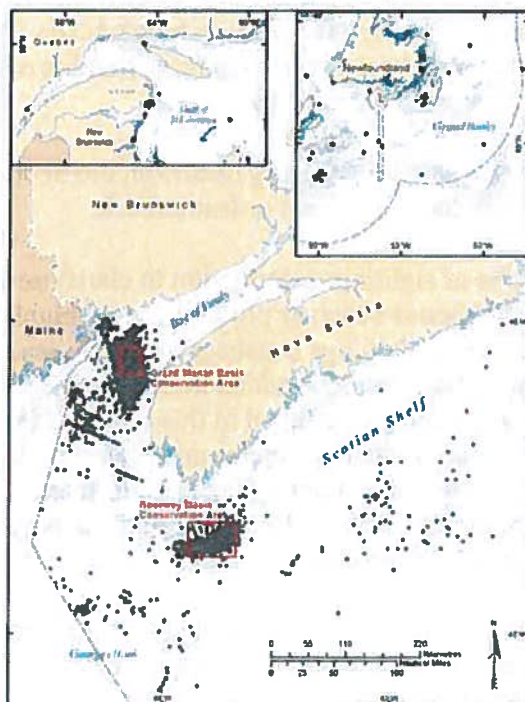


Figure 1. North Atlantic right whale sightings from 1951-2005 from the North Atlantic Right Whale Consortium database, and the DFO Maritimes and Newfoundland Region cetacean sightings databases. Figure from Figure 2 of the North Atlantic right whale Recovery Strategy;

<http://www.sararegistry.gc.ca/default.asp?lang=En&n=88D01216-1&offset=5&toc=show>.

3.2.5.3 Sea Turtles, P.3.51: Much information has been published in the primary literature on the population characteristics, distribution, and movements of sea turtles in Canadian Atlantic waters (e.g., James et al., 2005, Ecology Letters; James et al. 2006 Biological Conservation; etc.), however, this report does not reference these papers. DFO encourages the authors to consider the published results of research focused on sea turtles in Canada and revise the report accordingly. The Study Area is, in fact, highly important to the biology of both

loggerhead and leatherback sea turtles inhabiting Canadian waters. This is supported by several studies, including the DFO Science advisory document (DFO 2011d) that is referenced once in the report. Additional references for sea turtles can be found here:

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2012/2012_036-eng.pdf

http://www.dfo-mpo.gc.ca/Csas-sccs/publications/resdocs-docrech/2012/2012_063-eng.pdf

3.2.5.3 Sea Turtles, Table 3.20, P.3.52: Leatherback turtle: Text concerning dive depths and times should be modified to reflect that this pertains to behaviour on the continental shelf. The text regarding primary areas should include waters east and southeast of Georges Bank, including the Northeast Channel.

Loggerhead turtle: Text states that turtles move southwards for the winter months. This is not the case for all turtles, and while shelf distributions of loggerheads may be expected to change markedly on a seasonal basis, turtles inhabiting warmer offshore waters do not necessarily “retrcat” southwards during the winter. Recent telemetry work focused on loggerheads in Canada reveals that after tagging in Canadian EEZ, some turtles move east, and sometimes even northeast. The Study Area falls within good habitat for juvenile loggerheads. This is attested to by telemetry data and corroborated also by the relatively large number of shipboard sightings during 2012 survey activities, as presented in the report.

Green turtle: There is some evidence that this species regularly occurs on the Scotian Shelf seasonally, albeit in much lower numbers than the loggerhead or leatherback.

3.2.5.2 Sea Turtles, Figure 3.19, P.3.53, Use of sightings information to clarify sea turtle distributions is misleading, as sightings and fisheries observer programs yield highly biased data. While the DFO Maritimes Region Cetacean Sightings Database has some sea turtle sightings, sea turtle sightings are not actively sought out and added to this database and thus only a small portion of sea turtle sightings available are included in this figure. It is more appropriate to look to what is known about species’ distributions from focused biological research, such as biotelemetry studies, etc. There is abundant published information in this realm and region for sea turtles. The Canadian Sea Turtle Network would be a more reliable source of information on sea turtle sightings within the area.

3.2.7 Special Areas, P.3.62: The Haddock Box is usually singled out for *Fisheries Act* closures, but this area does not have greater protection than other *Fisheries Act* closures and is captured under the various *Fisheries Act* closures category.

2nd paragraph“...DFO experts identified EBSAs ~~for consideration in MPA network analysis exercise~~ to address conservation objectives in accordance with the *Oceans Act*.” MPA analysis is not the sole purpose of identifying EBSAs. ~~This MPA network analysis is an ongoing process and~~ Although many EBSAs in the Study Area may not have formal protection under federal legislation, they warrant consideration for conservation given the ecological and biological significance of the sites. As well, certain EBSAs may require greater management and protection and will be considered during the ongoing marine protected area

(MPA) network analysis, which may have impacts on ocean use. ~~It is also likely that future MPAs which could have restrictions on ocean use will be linked to EBSAs.~~

3.2.7 Special Areas, Figure 3.22: The Hake Small Mesh Gear Line should be included on Figures 15 and 16 in the Appendix, not in the Special Areas figure. These areas indicate where fishing is permitted and are not fishery conservation areas. They are important to include on Figures 15 and 16 in order to illustrate that it would be difficult to relocate this fishery.

3.2.7 Special Areas, Table 3.24, P.3.66: North Atlantic Right Whale
Second bullet should read: “The North Atlantic right whale (*Eubalaena glacialis*) is listed as an endangered species on Schedule 1 of SARA. Critical habitat is identified in the Recovery Strategy for the North Atlantic right whale in Atlantic Canadian Waters (Brown *et al.*, 2009).” ~~Research is ongoing to refine these boundaries.~~

3.2.7 Special Areas, Table 3.24, P.3.69: Select fisheries closures for fisheries conservation.
Although the table identifies many known fisheries closures that have established to protect spawning, there are other closures or management measures in place to protect spawning and nursery areas that are not included here (e.g., scallop fishery closure in June to protect spawning yellowtail flounder). In addition, spawning locations and/or timing for many species remain unknown. DFO should be consulted during a project-specific EA to ensure accurate and up to date information on spawning times and location is incorporated.

3.2.7 Special Areas, Table 3.25, P.3.73: Scotian Slope/Shelf Break: Note that this area is not only “migratory” habitat for leatherback turtles, but also represents summer-through-fall foraging habitat.

3.3.1 Commercial Fish and Fisheries, P.3.74: Text of the last paragraph that discusses Table 3.26 should note that the data in the table is representative of 2012 licence counts and preliminary landings data as of August 16, 2013. It should also note that the data in Table 3.26 offers a snapshot of fishing activity in the area, as well as note that licence and landings information for these fisheries may vary between years. The text should also link to the aggregated landings maps provided in Appendix B, which provide an overall picture of fishing activity in the area over a much longer time period.

3.3.1 Commercial Fish and Fisheries, Figure 3.27: Should include the offshore lobster fishing area, LFA 41, which overlaps with the Study and Project Areas.

3.3.1 Commercial Fish and Fisheries, Table 3.26, P.3.77: The data in Table 3.26 should be referenced as “Fisheries and Oceans Canada (2013)” and not “pers comm. Joe Walcott”. This applies anywhere else in the documents that Joe Walcott is cited. Additional comments on this table include:

- Column 1 header should read “fishery” and not “fisher”.
- The licence information is from 2012, so “(2012)” should be added to the column headers for the Commercial and Communal Commercial licences (Columns 2 and 3).

- Footnote 2 is not correct. A more accurate footnote should read ““To protect confidentiality, landings totals are denoted by an asterisk (*) in instances where less than five separate licence holders have been active.”

3.3.1 Commercial Fish and Fisheries, Table 3.27, P.3.80: The table of fishery landings data should be referenced as “Fisheries and Oceans Canada (2013)”, as well as describe any conditions that may be associated with the data (e.g. “preliminary”).

3.3.1 Commercial Fish and Fisheries, Table 3.28, P.3.82: Indicates low fishing activity within the season for scallops in January, February and March. This is not the case in all years, particularly on Browns Bank North when TACs are high. Considerable fishing effort can be directed there in the first quarter of the year.

3.3.1.2 Groundfish Fisheries, Table 3.30, P.3.84: The collapse and closure of the cod and haddock fisheries occurred on the Eastern Scotian Shelf, NAFO fishing area 4VW. This area remains closed. Groundfish remain an important fishery in NAFO area 4X, which overlaps with the Project and Study Areas.

3.3.1.3 Shellfish Fisheries, Table 3.31, P.3.85:

Scallop: The statement “The fishing season is open year-round; however there may be closures if catch rates or yields are low.” no longer applies. It did apply when there were rolling TACs (i.e., if meat counts and catch rates could be maintained, TACs could be increased) but that management approach was abandoned a number of years ago. The general premise is that the fishing seasons are open year-around.

Lobster: The report indicates that trawls have been used more in the past. Trawls are multiple traps on one line. This should be indicated to avoid the confusion that trawlers or “draggers” (using a net) are being used to fish for lobster as this is not the case. The use of trap trawls is currently the method of fishing in offshore areas. Single traps are used in the very near shore areas.

Crab: The Jonah crab fishery occurs in the same area as the offshore lobster fishery.

Exploratory: There may be exploratory fisheries that occur within the study area, including the potential for an experimental whelk fishery in 2014.

3.3.2 Aboriginal Fisheries, P.3.85: The section notes the importance of consulting Aboriginal groups and cites a DFO (2008) document. The section should more clearly describe and affirm the Crown’s “Duty to Consult”, and cite the Government of Canada guidelines on Aboriginal Consultation and Accommodation rather than a DFO document (see: <http://www.aadnc-aandc.gc.ca/eng/1100100014664/1100100014675>).

3.3.2 Aboriginal Fisheries, P.3.86: The last paragraph of the section indicates that there are “144 Communal Commercial fishing licences ...”, although the sum in Table 3.26 above is 134 Communal Commercial fishing licences. This inconsistency should be reconciled.

3.3.3 Recreational Fisheries, P.3.86: Should be referenced as “Fisheries and Oceans

Canada (2013)” and not “pers comm. M.MacLean.”

3.3.4 Other Ocean Users- Scientific Research P.3.87-P.3.88: The Ocean Tracking Network (OTN based at Dalhousie University) and DFO jointly operate a fixed and semi-permanent series of almost 200 acoustic receivers along the ocean bottom along the Halifax line. These receivers could potentially be impacted by seismic surveys in the area. This needs to be included in the document. Also, DFO bottom trawl surveys generally occur in March and July.

4.5 Selection of Valued Environmental Components, Table 4.2, P.4.7:

Fish: The “VEC Selected” column needs to include **Commercial, Aboriginal and recreational fisheries resources and the species that support these.**

Marine Mammals and Sea Turtles “Provided that appropriate mitigation is applied for species of special status, it is not anticipated that exploration activities will have an adverse effect at the population level for secure populations of marine mammals or sea turtles.” Reference to “appropriate mitigation” is made here, however, curbing activities if and when wildlife observers happen to spot sea turtles during ship operations should not be considered/listed as an effective mitigation tool.

Fisheries: “Commercial, recreational and Aboriginal fisheries (including relevant fish species **that support these fisheries**).” The SEA indicates some of the key fisheries in the area; however it does not capture all of the species. The description of species could be improved by breaking the species down into groundfish, invertebrates and pelagics. The only shellfish indicated is inshore/offshore lobster fishery, but there are also crab and scallop fisheries in the area. Environmental effects on fisheries resources should include impacts on productivity.

4.6 Potential Exploration Activities- Environment Interactions, Table 4.3 P.4.9: Seismic surveying: Underwater noise issues on species of special status and commercial, recreational and Aboriginal fish species.

5.1.1.1 Seismic and Seabed Surveys, P.5.1: A general explanation of spherical and cylindrical spreading is provided, but the effects of things like seasonal thermoclines (which are likely to occur within the Study Area) on sound propagation are not discussed (i.e., what happens if the sound becomes trapped in a deep-water sound channel?). Within the “Physiological and Behavioral Effects on Marine Mammals” section, the statement that “...sound may concentrate in deep water layers at depth and as a result travel farther.” should perhaps be further discussed within this section – how does this happen and how much further does the sound spread?

5.1.1.1 Physiological and Behavioral Effects on Fish Species, P.5.2: The section on effects on fish species makes no mention of effects on sharks. However, it is well documented that sharks have very sensitive hearing, especially at low frequencies. Thus there will almost certainly be behavioural effects on sharks due to seismic surveys. Given that Porbeagle sharks are common in the Study Area and are a Species of Special Status, a separate paragraph on shark effects needs to be included here. This same comment also applies to Section 5.2.1

This section states that “the majority of fish species of special status that are likely to be present are demersal” and “a few species have eggs and larvae that are pelagic in nature.” The concern is not only around the eggs of larvae of fish species of special status, but also eggs and larvae of fish species that support commercial, recreational and Aboriginal fisheries, such as lobster, that have larvae that are pelagic in nature. As such, potential effects on larvae of fisheries resource species should be considered here.

There are maps available that identify important areas for fish, including larvae distribution, that should be referenced in this section.

Horsman, T.L. and Shackell, N.L. 2009. Atlas of important habitat for key fish species on the Scotian Shelf, Canada. Can.Tech.Rep.Fish.Aquat.Sci. 2835:viii+82 p.

Section 5.1.1.1 Physiological and Behavioral Effects on Marine Mammals, P.5.3-5.5:

Given that the aim of this section is to summarize the potential effects of these activities on species of special status, there should be more discussion of the consequences of the different potential impacts on endangered species, such as right whales, blue whales and northern bottlenose whales. There is a lot of general information given, but the discussion doesn't relate that information back to these species of special status. For example, physical harm is discussed as a potential effect on marine mammals. Although it is unlikely that the activities would cause physical harm to northern bottlenose whales or right whales, the risk of physical harm does exist, and the death of even one individual could result in a population decline (see the bottlenose whale and right whale recovery strategies), thus the consequences of such an event would be high even if the likelihood of occurrence is low. The potential impacts of displacement and disturbance could also be discussed through this lens.

During the discussion of the potential effects of seismic noise on baleen whales, the following statement is made: “This avoidance and displacement from continuously operating seismic vessels could have varying effects based on whether the animal is simply migrating or situated in important habitat.” This should be discussed in the context of right whales, as their critical habitat (and feeding area) is included in the Study Area. Right whales coming to the Scotian Shelf are congregating in feeding areas, and displacing these animals from feeding grounds over long periods of time have the potential for significant effects on both individuals and the population.

In this section, it is suggested that whales would have to be within 30 m of the airgun array to experience a hearing threshold shift, but in section 5.2.1.1, it is discussed that sounds 180 dB rms and above could induce physical harm and hearing damage, and sound pressure levels of 180 dB rms could propagate approximately 1 km from the source. These numbers are quite different - should the safety radius to reduce the probability of physical harm to whales be 30 m, or 1000 m? If it is 1000 m, that is greater than the suggested 500 m safety radius in the SOCP and increasing the safety radius to 1000 m should be highlighted and included in the suggested mitigation measures and Table 5.1. In general, the Sections 5.1.1.1 and 5.2.1.1 should be compared for consistency in the information presented.

Audiograms for northern bottlenose whales (and other large whales) have not been produced; thus, we actually do not know the hearing range of these animals. We therefore don't actually know the 'peak hearing range' of northern bottlenose whales as is suggested within this section. Rather we know what their vocalization range is and it is likely that their hearing range overlaps their vocalization range (though we do not have direct knowledge of this).

During the discussion of the Gully Seismic Research Program, the statement is made "There is no indications that marine mammals...were significantly affected..." and yet the paragraph goes on to discuss why conclusions about whale behavior in the presence of seismic cannot be made based on this study. If data were not collected before, during and after the seismic program, then the impact of the program cannot be determined. "Marine mammals were still observed in the area during the seismic programs" would be a more accurate statement. Masking is potential effect that is not really discussed and additional consideration of this effect should be added.

5.1.1.1 Physiological and behavioural effects on sea turtles, P.5.5: The authors should consider the recently published work by Wendy Dow Piniak (Duke University).

5.1.1.2 Exploratory Drilling, P.5.7: The potential effects of drilling activities on marine mammals are not thoroughly discussed. Continuous noise generated by drilling activity could potentially have physiological and behavioral effects on marine mammals. For example, drilling may potentially disturb marine mammals, mask their vocalizations, or cause avoidance of an area. The statement, "The effect of drilling noise on marine mammals of special status is considered to be temporary and reversible." does not have corresponding evidence. It is recommended against making statements like this based on outdated SEAs. References from the primary literature should be provided. As stated in the previous section on seismic sound, if species of special status, such as right whales, are forced to avoid prime foraging habitat for an extended period, this could potentially have significant population-level impacts. Also, what evidence is there to support the statement, "North Atlantic right whale is one species known to exhibit long distance avoidance behaviour"?

5.1.1.3 Vessel Traffic, P.5.8-5.9: "With proper mitigation (marine mammal observers and avoidance of the Roseway Basin Area) the impact of vessel traffic on marine mammals is not expected to be a major concern." This is likely the case, but given the risk posed by vessel traffic to endangered right whales, it is recommended that oil/gas operators be instructed to consult with DFO to ensure appropriate mitigation is in place.

5.1.1.5 Accidental Spills, P.5.9-5.10: A reference is needed in the second paragraph, second sentence on sublethal effects. The following may be considered Adams et al. (2013); Greer et al. (2012) and McIntosh et al. (2010). These papers highlight the impacts of dispersed oil on herring, which is included as a VEC in the Study Area.

In the third paragraph, first bullet referring to oil and dispersants, there is new information published by Adams et al. (2013) that indicates dispersants (e.g., Corexit 9500) and oil do not cause synergistic toxicity to fish embryos. The use of chemical dispersant to enhance the dispersion of oil produces a condition where the submerged oil becomes bioavailable to fish.

The latter can create, depending on environmental conditions, a situation that increases the likelihood of potential impacts to fish and should be discussed in this section.

Accidental spills, particularly a blowout, have the potential to cause significant and long-term environmental impacts. The potential population-level impacts of such incidents, particularly on species of special status, should be discussed. Mitigation of these potential impacts, particularly what is expected of oil and gas companies in term of mitigation and response, should also be discussed.

5.1.2. Mitigation and Planning Considerations, P.5.11: DFO did not undertake a review of the SOCP in 2013, but will work in collaboration with the CNSOPB to identify and develop enhanced mitigation requirements beyond the SOCP, as required.

Project-specific EAs will need to address the issue of compliance with S. 32 of the *Species at Risk Act* for endangered and threatened species, and not just address the issue of “harassment.”

5.1.2. Mitigation and Planning Considerations, Table 5.1, P.5.11-5.12: Note that Section 5.1.1.3 states that marine mammal observers can be used to help mitigate the potential impact of vessel traffic on marine mammals; however, marine mammal observers are not listed as a mitigation and planning consideration for vessel traffic in this table.

Seismic and Seabed Surveys: “Enhanced mitigation may be required for seismic surveys, such as the 30 minute required observation period outlined in the SOCP will be extended to 60 minutes if beaked whales are observed at the surface prior to ramp up.” In areas where beaked whales are likely to occur, an extended observation period is required as they spend long periods of time (60-70 minutes) below the surface. As such, the observation should be extended even if whales are not observed in the first 30 minutes.

Promoting the use of sea turtle observers on vessels is ineffective as a mitigation tool. Sea turtles are exceptionally difficult to spot from the shipboard perspective (an aerial perspective is a better option), thus there is very limited utility in equipping vessels with observers to report presence of turtles and the absence of turtles could never be concluded this way. Therefore, there is little value inherent in statements regarding delaying use of explosives, or delineating “safe operating distances” etc. based on whether or not sea turtles have been observed at the surface by shipboard wildlife spotters (also applies to Table E.1, Table 5.1.1.4, Tables 5.1, 5.2, 9.1 etc.). A better mitigation tool with respect to marine turtles would be to consider the temporal distribution of these species and schedule development surveys/activities to occur at those times of year when turtles are not present in the area (as supported by biotelemetry work and knowledge of physiological constraints related to ambient ocean temperatures, etc.).

Accidental Spills: Are there any mitigation measures considered to address the type of oil (e.g., light, medium or heavy crude) that could potentially spill during exploratory drilling? Is this considered under the bullets outlined in the adjacent column? The type of product spilled can affect decisions on response options.

5.1.3 Data Gaps and Uncertainties, P.5.12: There is a lack of information regarding the deeper sections of the marine benthic environment in the area. As indicated in the SEA, the ongoing erosion of Dawson and Verill Canyons and areas between may enhance the biological productivity of the area. The lack of recent information of these areas could be noted as a data gap.

5.2 Special Areas, P.5.13 ~~“There is some uncertainty regarding the ecological importance of some EBSAs.”~~ The remainder of this paragraph should read:

DFO is in the process of identifying a network of MPAs in the Scotian Shelf/Bay of Fundy region (DFO 2009a). As part of this process, DFO is undertaking a review of EBSAs identified in the offshore Scotian Shelf (Doherty and Horsman, 2007). This effort will refine boundaries, using the Convention on Biological Diversity EBSA criteria, further describe ecological features of these areas and may result in the identification of different EBSAs than those identified in this report. Certain EBSAs are better understood, such as the Northeast Channel (EBSA 5), a recognized hotspot for cold water corals. DFO is also undertaking a project to assess EBSAs against current/potential human activities and management measures to provide management and mitigation information for these areas.

5.2.1.1 Effects of Seismic Noise on Areas of Significance for Marine Mammals and Sea Turtles P.5.15: The statement “The importance of the Scotian Slope/ Shelf Break to leatherback sea turtles is uncertain” is incorrect. There is abundant evidence for leatherback turtle use of shelf break foraging areas across its range, and portions of the Scotian Shelf break, including areas directly corresponding to the Study Area which is the focus of these reports. Note the designation of important leatherback foraging habitat within the SEA study area boundaries in a recent analysis led by DFO Science using biotelemetry data (the study DFO 2011d referred to in the reports).

5.2.1.1 Effects of Seabed Surveys on Sensitive Benthic Areas, P.5.15: There are references to potential effects on corals and sponges. The wording on P.9.2 – which says corals, sponges or other sensitive features – should be used throughout, given that other sensitive benthic areas are likely to be identified during the life of this SEA. In addition, the physical interaction of the seismic ship and gear with marine mammals should be discussed here as well.

5.2.1.2 and 5.3.1.2 Exploratory Drilling, P.5.16 and P.5.24: It is noted that EEM off Atlantic Canada has demonstrated that there are changes to the diversity and abundance of benthic organisms limited to within 1000 metres of the well site and that the benthic environment returned to baseline conditions within 12 months on cessation of drilling. This statement may need to be qualified so that it is not taken out of context. It appears that this statement comes from the Hurley and Ellis 2004 report prepared for CEAA (as indicated in section 5.33.1.2). This statement was made based on extensive monitoring results at SOEP; however that information is qualified by saying that the highly mobile nature of the sandy sediments on shallower areas of Sable Bank may explain the small contaminant zone. All of the EEM programs that were reviewed in this report had a number of different variables and the majority were conducted in shallow water. There were different classes of muds and different methods of disposal (Chevron H-23 treated and disposed of large portion of cuttings

on shore). The information from these shallow water areas may not be transferrable to the deep water environment or other exploratory drilling programs, therefore, it is suggested that the statement that “Fisheries are therefore not expected to be affected by drilling discharges” may need to be qualified or removed.

5.2.1.5 Accidental Spills, P.5.17-5.18: In the second last sentence referring to Deepwater Horizon blowout; please note that the spill occurred in 2010, not 2009. In the second paragraph, the statement that “Diesel is a highly volatile fuel and it will evaporate from the sea surface in 1-2 days.” requires a reference to support it. Under what sea state and/or environmental conditions will this occur?

5.2.2 Mitigation and Planning Considerations, P5.19-P.5.20: This section makes important statements regarding mitigation by avoiding or controlling interactions with special areas. Examples include the discussion of codes of conduct and statements like “Special Areas that are particularly important/sensitive.....are those that provide important habitat...and are important for life cycle stages.....Avoiding these areas during these critical life-cycle stages is an appropriate mitigation measure, especially during spawning and juvenile stages. Current spatial and temporal information of these critical life history stages will be required for the application of most mitigation measures.” This section also notes that proponents would have to work closely with DFO for this information and advice. This should be reinforced in other parts of the document. For example, in Table 5.3, there is no mention of consultation with DFO on the subject of areas that are critical to life-cycle stages. And under 5.3.3, it should state that there should be ongoing consultation with DFO and other experts on this subject.

Under the Data Gaps section, it should be noted that data gaps associated with the understanding of areas and timing of critical life-cycle stages exist.

**5.2.2 Mitigation and Planning considerations, Table 5.2, P.5.20-5.21:
Seismic and seabed surveys**

“Enhanced mitigation may be required for seismic surveys, such as the 30 minute required observation period outlined in the SOCP will be extended to 60 minutes ~~if beaked whales are observed at the surface prior to ramp-up.~~” In areas where beaked whales are likely to occur, an extended observation period is required as they spend long periods of time (60-70 minutes) below the surface. As such, the observation should be extended even if whales are not observed in the first 30 minutes.

“Schedule surveying to minimize interaction with peak spawning in the Haddock Box (April to May).” The Haddock Box should be included here only as an example, and the mitigation measure to minimize interaction with peak spawning times should apply to all species.

The last bullet in the Accidental Spill part of the table references the use of an Environmental Effects Monitoring (EEM) Plan to address post-spill effects. All EEM programs require background monitoring prior to any proposed human activity (e.g., exploratory drilling.) Will baseline information be gathered in the proposed phases 3A and 3B or has it already been done? If so, it should be mentioned in the SEA for phases 3A and 3B.

5.3.1 Potential Effects and Existing Knowledge, P.5.22: This section needs to reflect the fisheries protection provisions under the *Fisheries Act* Section 35. (1) No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Effects on fish that are part of a commercial, recreational or Aboriginal fishery, and the known species that support the key commercial, recreational or Aboriginal fisheries in the area need to be considered.

5.3.1.1 Seismic and seabed surveys, P.5.22 – This section should include a bullet on potential impacts on fish productivity, in accordance with the mitigation and protection priorities contained in the SOCP (e.g., impacts if spawning or other critical life stages are affected).

5.3.1.2 Exploratory Drilling, P.5.25: As per the comments regarding limitations on transferring EEM results from SOEP, the statement “Fisheries are therefore not expected to be affected by drilling discharges.” is not supported.

5.3.2 Mitigation and Planning Considerations, Table 5.3, P.5.28-5.29: In relation to the comments related to Table 5.2, one of the proposed mitigation measures in Table 5.3 is to avoid surveys in the Haddock Box during peak spawning times. As per comments above, this should only be an example as there are other areas that could be critical to life-cycle stages. Further, understanding of these areas could change during the life of the SEA.

7.2 Cumulative effects analysis, P.7.4: The discussion around the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative is outdated as the process concluded in 2012. It should be removed, and replaced with reference to DFO’s ongoing mandate for Integrated Oceans Management on the Scotian Shelf, which includes the promotion of ecosystem approaches to management, conflict avoidance and mitigation, and effective intergovernmental coordination for ocean management.

7.2 Cumulative effects analysis, Table 7.1, P.7.5: As noted by the SEA report, it is difficult to do more than identify the potential interactions and associated effects at the strategic level. However, it is important that the SEA note the potential for cumulative effects for the area given that there is potential for multiple seismic and exploratory drilling programs in conjunction with existing, expanding or other new ocean uses, as well environmental stressors associated with climate and environmental changes. It is not possible with current methodologies and approaches to accurately predict the scope and impact of these effects at the SEA level. This is a similar problem at the project level, but it is more likely that cumulative effects and associated mitigation measures can be defined and quantified when dealing with the specifics of a proposed activity. DFO strongly cautions against making determinations that “cumulative effects are not likely to be significant given the implementation of mitigation.” The column on “Residual Cumulative Effects” in Table 7.1 should be re-worded or re-structured to remove such statements, and these types of statements should also be removed from the SEA text. Again, the purpose of the SEA is to identify potential environmental effects and mitigative/protective measures that may be available for addressing effects. It is not DFO’s understanding that the SEA is meant to determine or pronounce on the actual significance of effects for future exploration activities.

8.0 Data gaps and recommendations, Table 8.1, P.8.1: With respect to the “Uncertainty around sublethal effects of seismic sound on marine animals”, DFO will be holding a National Canadian Scientific Advisory process to review mitigation and monitoring measures for addressing seismic impacts on SARA-listed whale species in March 2014.

9.0 Summary and Conclusions, P.9.1: Consideration of comments on section 5 will result in changes to section 9.

9.0 Summary and Conclusions, Table 9.1, P.9.1: Comments on tables E.1 5.1, 5.2, 5.3 should also be considered for table 9.1.

9.0 Summary and Conclusions, P.9.3: “Assuming adherence to applicable standards and regulations and the implementation of mitigation and monitoring as recommended, exploration activities are not expected to result in unacceptable adverse environmental effects (including cumulative effects) such that population of species of special status or the integrity of special areas would be compromised.” and “...environmental effects on fisheries are also not expected to result in unacceptable effects provided implementation of recommended mitigation and ongoing communication with fishery stakeholders.”

DFO notes that the SEA does not include a complete/exhaustive list of mitigation and monitoring requirements, particularly around species of special status, and additional mitigation measures beyond those listed in the SEA may be required. As such, the above statements are potentially misleading and could indicate to proponents that applying mitigation outlined in the SEA is all that is required. It should be amended to reference the potential requirement for additional or alternative mitigation measures at the project level. As with the comments regarding language around cumulative effects, DFO recommends against making these types of definitive statements at the SEA level. It is our view that the SEA is intended to identify and discuss potential interactions, effects and mitigation responses, but beyond determining that there is sufficient information available for consideration of future oil and gas exploration, the SEA should not make statements that dismiss the potential for significant effects.

10.0 References: Li, Z et al 2011 Surname is: Zhai ; first name is: Li

Zhai, L., Platt, T., Tang, C., Sathyendranath, S., and Hernández Walls, R. 2011. Phytoplankton phenology on the Scotian Shelf. *ICES Journal of Marine Science*, 68: 781–791.

Adams, J., Sweeney, M. and Hudson, P. 2013. Oil and oil dispersant do not cause synergistic toxicity to fish embryos. *Environmental Toxicology and Chemistry*, 33(1): 1-8.

Fraser, 1989. Methods for making dispersant use decisions. *In the proceeding of the International Oil Spill Conference*.

Greer, C., Hudson, P., Li, Z., King, T., Lee, K. 2012. Toxicity of crude oil chemically dispersed in a wave tank to embryos of Atlantic Herring (*Clupea harengus*). *Environmental Toxicology and Chemistry*, 31(6): 1324-1333.

McIntosh, S., King, T., Wu., D., and Hudson, P. 2010. Toxicity of dispersed weathered crude oil to early life stages of Atlantic Herring (*Clupea harengus*). *Environmental Toxicology and Chemistry*, 29(5): 1160-1167.

Appendix B – Fishery Landings Data: The table of fishery landings data should be referenced as “Fisheries and Oceans Canada (2013)”, as well as describe any conditions that may be associated with the data (e.g. “preliminary”).

Appendix B – Figure 22 (Offshore Lobster): This figure should include, under its legend header “Offshore Fishery Lobster Landings” a statement that “(This data is Proprietary information and cannot be reproduced without the written permission of DFO)”. DFO received permission from the single licence holder to release offshore lobster landings data to the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) for sole use in its series of Strategic Environmental Assessments. A condition of the data’s release is that a proprietary statement accompany any use of the data in tables, figures, or text when used in the SEAs. For additional guidance refer to the Offshore Clam figure of Appendix B in the CNSOPB Strategic Environmental Assessment (Phase 2B).

Western Scotian Shelf Phase 3A:

3.1.1 Oceanography: Temperature, salinity, density and dissolved oxygen profiles (Figures 3.3-3.6) are provided in 3B. Is this data also available for 3A?

Phase 3B SEA

2.3.4 Oil Spill Prevention and Response P.2.22 line 8: Change the word “Macdondo” to “Macondo.”

Western Scotian Slope Phase 3B:

3.1.2 Climatology, Table 3.1, P.3.10: Should be seasonal wind statistics for grid point 1410, not 4457.

3.1.2 Overview of Physical Characteristics, Table 3.8, P.3.17-3.20:

Sea Bed Characteristics: The description provided seems to focus predominantly on the shelf and shelf break area, where the majority of the study area in SEA phase 3B is in much deeper water on the slope. Some of the known corals and sponges are mentioned, however due to the lack of information on the deep water environment there could be other undiscovered sensitive species in deeper water of the shelf. Suggest that they note that there is limited information on the physical characteristics of the seabed on the deep water section of the slope.

3.2.3 Corals and Sponges, P.3.25: It should be noted that sampling and research has not been conducted in the deep water environment and, as mentioned above, there there is limited information on the physical characteristics of the seabed on the deep water section of the slope. Absence of coral and sponge observations in deep water beyond the shelf break reflect an absence of survey effort rather than an absence of organisms.

3.3.1 Commercial Fish and Fisheries, P.3.74: This section should include Aboriginal Fisheries as part of the Socio-Economic Characteristics.

3.3.3.1 Shellfish Fisheries, Table 3.31, P.3.85: Fishing for offshore lobster occurs in LFA 41.

5.1.3 Data Gaps and Uncertainties, P.5.12: Suggest that it be noted that there is a lack of information of the deep water environment and how it interacts with the fish and fisheries in the area.