GENERAL COMMENTS

Fisheries and Oceans Canada

Please be advised that DFO recommends that Statoil adhere to the "*Statement of Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment"* (SOCP) when conducting seismic programs. The SOCP specifies the mitigation requirements that must be met during the Planning Seismic Surveys, Safety Zone and Start-up, Shut-down of Air Source Array(s), Line Changes and Maintenance Shut-downs, Operations in Low Visibility and Additional Mitigative Measures and Modifications in order to minimize impacts on life in the oceans. These requirements are set out as **minimum standards**, which will apply in all non-ice covered marine waters in Canada.
Sensitive Areas should include areas that are considered vulnerable, specifically areas that are known to have coral and/or sponge. Please consider incorporating aspects of the following documents:

- "Status Report on Coral and Sponge Conservation in Canada" for context of coral/sponge conservation in NL waters. http://www.dfo-mpo.gc.ca/library/340259E.pdf Sections: 3.2.2, 4.5, 7.2.1 as well as Figures: 1, 6, 7)
- Canadian Science Advisory Secretariat Science Advisory Report 2010/041 "Occurrence, Sensitivity to Fishing, and Ecological Function of Corals, Sponges, and Hydrothermal Vents in Canadian Waters" http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/sar-as/2010/2010_041_e.pdf
- NAFO Conservation and Enforcement Measures 2011 Article 16 "Coral and Sponge Protection Zones" http://www.nafo.int/fisheries/frames/regulations.html

It is noted in the EA that electromagnetic surveys are not specifically assessed, but may be a part of the geophysical program. However the potential impacts of the electromagnetic survey, mitigations, significance, residual impacts, have not been addressed in this EA Report.

The information provided in the report is well presented and up to date. However additional information related to international waters would help to improve the report. For instance, information on fish surveys and fisheries could be improved with regards to international waters. Data from the NAFO is mostly restricted to the landings database STATLANT 21A. However, there is more NAFO-linked information that could be presented in this assessment.

In terms of corals, sponges, and vulnerable marine ecosystems (VME), the assessment mainly reports studies from Canadian sources such as DFO documents. These documents provide good information, but typically do not include information from outside the EEZ. Information from outside the EEZ should be included to provide a balanced picture of the ecosystem being affected

by this proposed project. For example, in 2008, the NAFO Working Group on Ecosystem Approaches to Fisheries Management identified a number of candidate VME areas and based on subsequent requests by the NAFO Scientific Council and NAFO Fisheries Commission, more tightly defined areas with high concentrations of corals and sponges were later identified. Many of these area, including most seamounts, have been closed to bottom trawl fishing by NAFO. None of the maps in this report actually show all these areas (candidate VME's and areas of high concentration of corals and sponges). Some of these identified areas are within the target area for this project, thus should be included in the report.

NAFO data on fishing locations can also be improved within this report. Portions of the project area squarely fall within the NAFO fisheries footprint. Furthermore, NAFO collects vessel monitoring system (VMS) data that may be available upon request to the NAFO secretariat.

This information would enhance the Report. For example, both Kenchington et al. (2010 DFO ResDoc10/40) and Cogswell et al. (2010, NAFO SCR 10/71) make use of this type of data for specific analyses and both reports provide maps of fishing location and fishing effort in NAFO waters.

Aggregate VMS data from NAFO will provide a better perspective of fisheries activities in the project area. Equally important is to incorporate information contained in NAFO documents related to VME areas and closed areas for corals and sponges. This information is readily available from the NAFO website (www.nafo.int). Some key meeting reports from NAFO documents include:
NAFO 2008 SCS 08/10
NAFO 2008 SCS 08/19
NAFO 2008 SCS 08/24
NAFO 2009 SCS 09/06
NAFO 2009 SCS 09/26
NAFO 2010 SCS 10/18
NAFO 2010 SCS 10/19
NAFO 2010 FC Doc 09/06
NAFO 2010 FC Doc 10/04
This list is not intended to be exhaustive, but provides a reasonable starting point.

C-NLOPB

Section 3 of the Scoping Document identifies the components of the project to be assessed. Although "electromagnetic surveys" are discussed in various upfront sections of the EA (e.g. pgd 1, 3, 9, 10), they are not included in the assessment of the project. Statoil should fully assess all components of the project (including electromagnetic surveys) that were identified in the Scoping Document.

Legends in some of the Figures are confusing. For example, Figure 1.1's legend should start with Study Area, not Project area as it is the larger area. There are several instances of this.

Department of National Defence

It was observed that the information provided to the C-NLOPB by the Department of National Defence (DND), through the Federal Coordination Regulations process, has not been included in the report. That information was:

> *"DND is likely to be operating in the vicinity of the study area in a non-interference manner during the April to October 2011 to 2019 timeframe. Unexploded Ordinate (UXO) data is available for the study area and a search of the records was conducted to determine the possible presence of UXO within the Statoil Project Description survey area. DND records indicate no wrecks are present within the survey area. However, as depicted in the attached graphic, one site is approximately 8 km from the western boundary of the study area. According to the database, it is a U-520 German IXC Type U-Boat which was sunk by depth charges from a Canadian Digby aircraft on 30 October 1942. The exact location of the wreck is uncertain due to the limitation of the positional location technology of the time (the site was plotted with information reported at the time of the sinking). Given our understanding of the survey activities to be conducted, the associated UXO risk is assessed as negligible. Nonetheless, due to the inherent dangers associated with UXO and the fact that the Atlantic Ocean was exposed to many naval engagements during WWII, should any suspected UXO be encountered during the course of Statoil's operations, it should not disturbed/manipulated. Statoil should mark the location and immediately inform the Coast Guard. Additional information is available in the 2010 Annual Edition - Notices to Mariners, Section F, No.37. In the event of activities which may have contact with the seabed (such as drilling or mooring), it is strongly advised that operational aids, such as remote operated vehicles, be used to conduct seabed survey in order to prevent unintentional contact with harmful UXO items that may have gone unreported or undetected. Further UXO general information is available at our website at* www.uxocanada.forces.gc.ca "

Particular attention should be made to the following:

> "… should any suspected UXO be encountered during the course of Statoil's operations, it should not be disturbed/manipulated. Statoil should mark the location and immediately inform the Coast Guard. Additional information is available in the 2010 Annual Edition – Notices to Mariners, Section F, No.37."

The assessment of the possible presence of this wrecked submarine and the potential for the presence of unexploded ordinates (UXO) is extremely important.

DND and the C-NLOPB requests that Statoil Canada Limited include the information provided to the C-NLOPB by the DND, through the Federal Coordination Regulations process, and provided to Statoil Canada Limited, via the Draft Scoping Document Review Comments, by the C-NLOPB on February 24, 2011 in the assessment report for the proposed project.

Environment Canada
Seabird Data Collection

This survey provides a good opportunity to collect additional seabird data from the area. CWS has developed a pelagic seabird monitoring protocol that we are recommending for all offshore projects. This protocol is a work in progress and we would appreciate feedback from the observers using it in the field. A guide sheet to the pelagic seabirds of Atlantic Canada is available through CWS in Mount Pearl.

In an effort to expedite the process of data exchange, the Canadian Wildlife Service would appreciate that the data (as it relate to migratory birds or species at risk) collected from these surveys be forwarded in digital format to our office following completion of the study. These data will be centralized for our internal use to help ensure that the best possible natural resource management decisions are made for these species in Newfoundland and Labrador. Metadata will be retained to identify source of data and will not be used for the purpose of publication. The Canadian Wildlife Service will not copy, distribute, loan, lease, sell, or use of this data as part of a value added product or otherwise make the DATA available to any other party without the prior express written consent.

Fish, Food and Allied Workers
To clarify a point made in the document (pg 199), fishing gear may only be retrieved from the water by the gear owner (i.e. fishing licence holder). This includes buoys, radar reflectors, rope, nets, pots, etc. associated with fishing gear and/or activity. If gear contact is made during seismic operations it should not be retrieved or retained by the seismic vessel. There are conditions that may warrant gear being retrieved or retained if it becomes entangled with seismic gear, however so, further clarification on rules and regulations regarding fishing gear should be directed to the Conservation and Protection Division of Fisheries and Oceans Canada (NL Region).

Also, to clarify, it is unreasonable for Statoil to encourage or ask a fish harvester to shift or set his gear away from the project area, see pg C-1, such that the seismic ship can pass through without incident. Setting gear in an area outside of normal fishing grounds may result in loss of catch, increased expenses, and therefore, decreased revenue for the harvester. Exploration activities should not be conducted at the expense of the harvester.

Another point in the document requires clarification. The Newfoundland and Labrador population of Atlantic Cod is not currently designated under COSEWIC

(pg 43). It may be recommended for this designation, but the Government of Canada has not made this decision on this.

The quota in 2010 for the 3M cod fishery was 44 tonnes. The quota in 2011 was increased to 10,000 tonnes (pg 109). In 2011, Canada acquired a greater percentage of the quota (0.8% in 2010, 3.3% in 2011). The company should be aware that there may be international fishing vessels operating in the 3M area that may or may not be familiar with communication practices that have been established for oil and gas exploration activities in Newfoundland and Labrador waters.

It is important for Statoil maintain regular communication with the FFAW to keep apprised of ongoing developments with fisheries in the large project area. A number of surveys and programs are proposed over the nine years. Harvesters are spread out over a wide geographic area and communication is vital to the safety of all involved.

The unknown long term effects of seismic activities continue to concern harvesters. There have been reports form harvesters that fish behaviour has been affected following seismic blasts and shellfish have disappeared from areas following seismic work being undertaken. There have also been reports from vessel captains that groundfish catches have been impacted when oil and gas activities have been ongoing. While the research has not determined any direct mortality of fish or shellfish attributable to seismic activity there may be behavioural changes that could affect migration and/or reproductive and spawning activities as well as movement of the exploitable biomass in an area. This, in turn, can impact catch rates in years to come. There is need for further research on impacts of seismic activity on important commercial species including shrimp, crab, turbot and Atlantic Cod to address data gaps.

The commercial fishery will be actively prosecuted at the time that Statoil is proposing to conduct its program in 2011 and beyond. While historical fishing patterns have been detailed in the document, fishing activity can change from year to year and during the season as well. While there has not been recent fishing activity recorded in the area of the 2011 proposed program, other areas of the project area are heavily fished by the inshore fleet. The offshore fleet and other international vessels may also be fishing in the area.

In addition to the deployment of a Fisheries Liaison Officer onboard the seismic vessel, to mitigate potential conflicts with fishing vessels and fishing gear (both towed and fixed gear) in heavily fished areas of the project area, the FFAW recommends that the company also consider the deployment of a Fisheries Guide Vessel when they work in this heavily fished area. The loss of fishing time, catch and/or gear that may be associated with gear entanglement in this area may be significant during this prime period so all avenues to mitigate conflicts should be considered. The deployment of a Fisheries Guide Vessel may also be

beneficial during the route analysis and/or transit of the seismic ship from St. John's to the Flemish Pass in 2011.

SPECIFIC COMMENTS

C-NLOPB

Section 1.0, pg 1, line 8 – "original 2008 seismic area". Figure 1.1 identifies it as the "2007 EA Project Area". Please be consistent throughout the EA report.

Section 1.1.1, pg 3, para. 1, line 8 – Insert "describing project activities and" after "C-NLOPB".

Section 1.1.1, pg 3, 2nd para., line 2 – Delete "to determine the need for submission of an update to the EA". The action that results from changes to the project activities will be determined at that time.

Section 2.1, pg 7, para. 2, last sentence – the reference to highlighted licences should be more appropriately read, "see licences in bold in Table 2.1". Also, there are only "29" significant discovery licences in Table 2.1.

Section 2.2, pg 8 – Please identify the total size of the "Project Area" and the "Study Area".

Section 2.2, pg 9, line 1 – "includes space". What exactly is the buffer included in the "Project Area" for vessel turning.

Section 2.2, pg 9, para. 2, last sentence – What exactly is meant by "*The option of carrying out …in the EA to follow.*" Please identify where in the EA report this was done. It states in Section 5.3 "Temporal" that "*geohazard surveys may be conducted at any time of the year*." This inconsistency is confusing and the actual temporal boundary for geohazard surveys that was assessed and is proposed during the 2012 to 2019 timeframe should be stated.

Section 2.3, pg 9 – It is mentioned in the EA report that the seismic vessel may deploy streamers enroute to the Project Area. Please provide details of this activity. Is it the intent to have active airguns during transit? If so, this would be outside the Project Area.

Section 2.3, pg 9, para. 1, line 2 - What is meant by "Ocean bottom seismic"?

Section 2.3, pg 9, last para., last sentence – Please identify where in the "following EA" this has been addressed.

Section 2.3.3, pg 11, last 2 sentences – "*one geohazard survey may occur in 2011*" and "*As many as five geohazard surveys per year may occur in 2011-2019*". Which is it?

Section 2.3.10.1, pg 15, line 1 – "may be". Will the seismic vessel be accompanied by a picket vessel or not.

Section 2.3.10.3, pg 15, last sentence – Please identify the "*relevant authorities*".

Section 3.3.1, pg 26, para. 3, line 3 – "…large annual variation in the steric height over…". Steric – of or relating to the spatial arrangement of atoms in a molecule. Is this what the author intended? If not, then please address.

Section 5.1.1.1, pg 108 – This section provides a summary of the discussions held with the various stakeholders. Some of the stakeholders asked specific questions (e.g. NHS – "Over what range will the noise generated…background levels?). Please identify where in the EA report these questions were addressed and hopefully answered.

Section 5.4.2, pg 112, last line – "(CEA Agency 1994)". Please provide the full reference in Section 6.0 Literature Cited.

Section 5.5, pg 116, 2nd para., line 10 – "reach certain levels". What are they?

Section 5.6.2.3, pg 142, Avoidance, para. 3 – Gear damage should be reported to the C-NLOPB.

Section 5.6.2.3, pg 142, Avoidance, para. 4, line 2 – It states what was done in "2002". Is this presently being done?

Section 5.7, pg 198 – Please ensure the list of projects is complete.

Section 5.8, pg 199, Table 5.18 – Please ensure that all mitigation measures identified throughout the EA report are included (e.g. monitoring for seabirds).

<u>Fisheries and Oceans Canada</u>

Section 4.1, pg 31, Please insert as follows*: "This EA focuses on components of the ecosystem such as selected species….that are important economically, socially, and* ***<u>ecologically</u>*** *with potential to interact with the project".*

Section 4.2.1, pg 31, Please insert as follows: "*The physical and chemical nature of the* ***<u>water column</u>*** *and bottom substrate is a critical factor affecting the characterization….."*

Section 4.2.2, pg 31, While the assessment is comprehensive and well done there is an exception with the section describing the pelagic ecosystem and the plankton of the study area. The linear foodweb described is overly simplistic and

does not represent our current understanding of planktonic foodwebs. Diatoms and copepods are an important component of the planktonic ecosystem at certain times of year in this region, but they are not always dominant and do not always represent the principal pathways of energy flow or carbon cycling. The timing of the spring bloom and the release of fish larvae into the upper water column have been shown to be important determinants of larval survival. This is particularly relevant for species such as redfish which have episodic recruitment. Specific information on the composition and dynamics of the pelagic communities of the study area should be documented, as should the importance of sedimentation for carbon supply of benthic foodwebs. It is suggested that some statements within the report require supporting material. An example in Section 4.2.2 is the statement that plankton is "*so ubiquitous and abundant*" is not necessarily supported by research. This statement should be clearly framed and justified. For example, there is evidence that primary production appears to be a general limiting factor for fisheries productivity in marine systems (see Chassot et al. 2010 Ecology Letters 13: 495-505) and hence, any factor affecting its abundance has the potential for affecting fisheries yields.

A description of the role of ice in the regulation of the phytoplankton bloom should be included (e.g. see Wu et al 2007 J. Plankton Research29:509-514). Ice plays a role in defining the environmental conditions required for the bloom to occur.

Section 4.2.5.2, pg 40, 2nd sentence, Feeding is most intense in fall and spring (not late winter) and diet is primarily copepods with some amphipods and euphausids.

Section 4.2.5.2, pg 40, It is not clear which dataset is being referenced here and therefore this section requires some clarification. The reference may be to the capelin by-catch in the shrimp fishery, which is not an exhaustive descriptor of their distribution as the shrimp fishery is located over a rather limited area. If this is the case then it would need to be stated. Another possibility is that the reference may be to the multi-species surveys, which are not part of a fishery. There is no offshore commercial capelin fishery.

Section 4.3.3.1, pg 50, 2nd sentence, Northern shrimp and snow crab are described as "*underutilized*". There were northern shrimp and snow crab fisheries prior to the collapse of the groundfish fishery. There is no evidence that the northern shrimp stock and snow crab stock was underutilized. It is suggested to replace the term "*underutilized species*" with "*other*".

Section 4.3.3.1, pg 53, 1st paragraph, It is suggested to replace the term "*formally underutilized species*" with "*other*", as "*formally underutilized species*" implies that they were present, but not fished. It may be that they were not there previously.

Section 4.3.4.2, pg 58, 2nd sentence, It is stated that the "*study area overlaps with parts of SFA 6*". However SFA 6 ends at the 200 mile limit. Please clarify whether the study area does or does not overlap with SFA 6.

Section 4.3.4.2, g 68, 2nd paragraph, It is suggested that the word "*Landed*" be placed before the word "*Prices*" to distinguish between prices paid to harvesters and final project market prices.

Section 4.3.4.2, pg 58, 2nd sentence, This sentence is confusing and should be rewritten.

Section 4.3.5, pg 74, In addition to the multi-species bottom trawl surveys listed, there is an annual Spring 3L Capelin acoustic survey which may be impacted.

Section 4.5.1.2, pg 88, DFO has population estimates for many cetacean and pinniped species in Atlantic Canada. These are based on systematic surveys such as those detailed in Lawson and Gosselin (2009) and Stenson *et al*. (2011). These figures could be quoted in place of the NOAA estimates unless the latter includes species for which the DFO surveys did not have enough sighting events to generate an acceptable estimate.

Section 4.5.1.3, pg 92, 1st paragraph, Based on aerial searches and acoustic recordings, the south eastern edge of the Grand Banks remains an area populated by cetaceans during the winter. Therefore, the statement "*although some individual baleen whales may be present in offshore waters of NL…*" is not necessarily accurate (Stenson et al 2011).

Section 4.5.1.3, pg 94, It is noted through DFO review that Sperm Whales are regularly sighted in shallow coastal waters, therefore may also be encountered in the Flemish Basin.

Section 4.5.1.5, pg 97, More information should be provided on the importance of the area for feeding Harp and Hooded Seals. The area of the NE Grand Banks, slope and Flemish Pass is critical for seals during the spring when they need to replenish their energy reserves. Satellite telemetry studies have shown that this area is used extensively by Hooded Seals in May. By late May they have left the area for the moulting ice although harps are still present through June. Harp Seals tend to remain on the continental shelf while Hooded Seals dive in the deep shelf waters.

Section 4.5.1.5, pg 97, The report estimates harp seal population at 6.85 million. Hammill and Stenson (2010) state the population is ~ 8 million.

Section 4.5.1.5, pg 97, Lavigne and Kovacs (1988) is not necessarily the best choice of reference for locations of pupping harp seals. There are a large number of papers in the primary literature indicating that the proportion pupping is not a

'small remainder'. In fact the proportion accounts for 25-30% of total pupping, which can be over 400,000 pups (Stenson et al 1993, 2002, 2003, 2009, 2010).

Section 4.6, pg 99, The word "*designated"* should be replaced with "*listed"* throughout these sections when referring to SARA listed species. The term "*designated*" would be more appropriate when referring to species that have been assessed by COSEWIC, but not listed on SARA.

Section 4.6, pg 99, 3rd paragraph, There is also a final recovery strategy posted on the SARA Registry for the North Atlantic Right Whale.

Section 4.6, pg 100, Table 4.12, It should be noted that for the Atlantic Salmon designatable units (DU) occurring in NL, only the South Newfoundland DU was assessed as threatened by COSEWIC.

Section 4.6, pg 100, Table 4.12, For the Deepwater Redfish, it is the Northern DU which was assessed by COSEWIC as threatened.

Section 4.7, Pg 105, This section of the EA notes that "there are a variety of regulatory frameworks that deal directly or indirectly with sensitive areas…", and lists them, but does not mention the *Oceans Act* (it is highlighted on pg 2 as relevant to environmental aspects of the EA but occurs nowhere else in the document). *Oceans Act* Marine Protected Areas are established by Fisheries and Oceans Canada to protect and conserve important fish and marine mammal habitats, endangered marine species, unique features and areas of high biological productivity or biodiversity.

Section 4.7.1, pg 105, In referring to the Placentia Bay/Grand Banks Large Ocean Management Area correctly refers to the existence of the Ecologically and biologically Significant Area (i.e. the Northeast Shelf and Slope) within the study area as a potential Area of Interest (i.e. AOI). However, it should also be noted within the EA Report that the *Oceans Act* provides the Minister of Fisheries and Oceans with a leadership role for coordinating the development and implementation of a federal network of Marine Protected Areas (MPA), of which can include areas within and outside of the Integrated Management (IM) area that has yet to be developed specifically within the Region to date. Therefore, there is the potential for subsequent identification of EBSAs, AOI, MPAs and other sensitive areas in the study area within the future

Section 5.1.1.1, pg 108, DFO suggests that the consultation section be expanded to include more information on the discussion between DFO and Statoil's consultant which included the importance of current and relevant information on SARA species and commercial fisheries. There was also additional correspondence in which DFO indicated that "DFO guidance on Seismic programs is based upon the "Statement of Practice with respect to the Mitigation of Seismic Sound in the Marine Environment" (SOCP) to protect fish

(including marine mammals), SARA species and fisheries. Mitigations from the SOCP should be incorporated into the EA Report, as well as updated fisheries and SARA information." (refer to email exchange of March 4 - 8, 2011 of S. Canning and J. Kelly titled: Statoil Canada Ltd. Geophysical Program for Jeanne d'Arc Basin and Central Ridge / Flemish Pass Basin, 2011 - 2019).

Section 5.2, pg 110, Under section 5.2 valued ecosystem components, the first of 6 VECs is titled "Commercial fish". However in each of the tables that follow pertaining to that VEC, it is referred to as "the fish and fish habitat VEC". It might be more appropriate to re-name that VEC in section (5.2), from "commercial fish" to "fish and fish habitat". The paragraph should then proceed to explain why only a few commercial species are considered under that VEC. Cod is one species mentioned under the existing commercial fish VEC, but little mention is made of spawning aggregations (i.e. breeding habitat) or mitigations to avoid breeding areas or breeding periods, should they be identified. A brief description of cod spawning characteristics might improve the EA. Although there maybe few large breeding aggregations of cod and other groundfish known to exist in the proposed study area (compared to historical accounts), the study duration is sufficiently long (-2019) allowing for significant changes to develop in offshore fish populations. An appropriate mitigation measure to reduce potential harm to VECs (such as breeding aggregations) is the avoidance of known breeding fish aggregations, either spatially or temporally.

Section 5.6.1.2, pg 125, A report on Lobster catch rates and seismic activity in Australia is noted. It is suggested to add something similar to the following statement "*However, the study noted that due to natural variability and fishing pressure, a large effect on lobster would be required to link any effect to seismic*".

Section 5.6.5, pg 193, The word "*designated"* should be replaced with "*listed"* throughout these sections when referring to SARA listed species. The term "*designated*" would be more appropriate when referring to species that have been assessed by COSEWIC, but not listed on SARA.

Section 5.8, pg 199, Table 5.18, The proponent will employ multiple trained MMO's in addition to the FLO. This will enhance the efficiency of this type of mitigation, although the EA could benefit from more detailed descriptions of the MMO activities to ensure the reviewers that the best possible methods will be employed.