

GENERAL COMMENTS

Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB)

Please provide the applicable reference for "*C-NLOPB Guidelines*" as it is used in various places throughout the document (e.g. pg 193 Accidental Releases).

Department of National Defence (DND)

The Department of National Defence provided comments on February 11, 2013 on the draft scoping document, however, the comments are not represented in the EA Report. These comments are requested to be included in the EA report.

Fisheries and Oceans Canada

With multiple human activities in the proposed project area, plus the likelihood that sound fields from multiple seismic projects on the Grand Banks (and over multiple years) will overlap to an unknown extent, and that a number of SARA-listed or non-listed marine species will incur multiple exposures to additional anthropogenic underwater noise, the proponents should consider adopting one of the newer quantitative approaches being developed to estimate cumulative impacts of this proposed project at the individual and population levels (e.g., Wood et al., 2012; Lawson and Lesage 2013).

The NAFO Convention Areas showing scientific and statistical Subareas, Divisions, and Subdivisions should be indicated on any figures that are discussed in this context.

It would be prudent to periodically revisit the potential impacts on commercial fisheries if the fishing activity or the planned seismic activity varies significantly from that described in this report.

Environment Canada

EC's previous comments on the scoping documents submitted during the finalization of the scoping document are still applicable to the report.

Nunatsiavut Government

Inuit depend on the marine environment for a subsistence lifestyle and for an economic livelihood (Inuit Fishery), and this seismic program could potentially have negative impacts on Inuit health and wellbeing. The GXT seismic program overlaps with the entirety of the Inuit fishery, specifically for shrimp, crab and turbot. Also, the catch weights presented in the report, with data from Fisheries and Oceans Canada, are not representative of the decrease in catch per unit effort for fish and shellfish experienced by fishers on the Labrador Coast since 2008, which corresponds with an increase in seismic activity on the Labrador Coast. Therefore, the Nunatsiavut Government recommends that seismic activities not begin prior to September 15 of each year and is adamant that

seismic activities do not disrupt the fishery, irrespective of the seismic survey plan of GXT.

The Nunatsiavut Government recommends that adaptive management for Project-specific or cumulative effects, whether conducted by GXT, government bodies, or in combination, be required. This would include the implementation of contingency plans and resources to enable responsive action, especially in areas where effect predictions are uncertain and where predictive errors may have serious consequences (e.g. disruption to traditional livelihoods or Inuit Fishery). Currently, Labrador Inuit bear the majority of the risk associated with seismic processes with few tangible benefits to the region. The Nunatsiavut Government expects the Proponent would accept a degree of responsibility for any negative changes in the Inuit Fishery and subsistence fishing, and that the burden of proof would not rest on Inuit stakeholders to demonstrate a cause and effect relationship with seismic processes and the fisheries.

Benefits for Labrador Inuit with associated seismic processes are a necessity. Hiring, training and ensuring meaningful employment for Labrador Inuit is essential. This could be established through an employment outreach program, which would include transportation assistance and measures to address social and cultural issues including any associated language barriers, if necessary. This would also include the establishment of paid trainee positions to be in place onboard the seismic vessel in order to build capacity. Furthermore, given that our Inuit fishers are not represented by the Fish, Food and Allied Workers Union, the Nunatsiavut Government is adamant that the Inuit Fisheries Liaison Officer be present on the seismic vessel at all times during the Project.

The Nunatsiavut Government recommends that an annual report be submitted to the CNLOPB and the Nunatsiavut Government no later than January 31, detailing the progress and potential environmental impacts of the Project, including progress on the implementation of mitigation measures and Inuit-specific opportunities.

Potential mitigation measures could still be arranged for the 2013 GXT seismic program and the Nunatsiavut Government recommends increased communication and consultation to address the ongoing concerns of Inuit in the region. Currently, few steps have been taken by the proponent to address the potential negative impacts of seismic activity within the Labrador Inuit Settlement Zone and Inuit Fishery.

Fish, Food and Allied Workers

It would be incumbent on GX Technology to submit an Environmental Assessment entailing all proposed operations to be pursued. Within the second paragraph of the document it is indicated that the temporal scope for this project is 2013-2015, albeit there are only indications of current plans showing 2D seismic acquisition in 2013.

For some general commentary on the document, there are references to Newfoundland and Labrador, then there is Newfoundland including Labrador, finally there is reference to NL – there should be consistency through out the document. Another disturbance

within the document is the usage of location/direction using letter form and full written form – same recommendation, there needs to be consistency throughout the document. Finally, on the same point of consistency it is recommended that the document always include the *Genus and Species* names for the various animals/fish being discussed – there are multiple instances where only the common English name is being used. Further, looking on page 147 there is a list of organizations contacted during the consultation process; in this the Groundfish Enterprise Allocation Council is listed twice.

The FFAW would like to suggest that the proponent prepare maps in a context where it is possible to see the project area, fish distribution, Seismic survey lines and NAFO regions all in one depiction. It is not sufficient that the variety of information be presented individually.

In the context of avoidance of fishing grounds and areas in which the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab, the FFAW would reiterate as we have done with other projects, there should be no seismic activity in vicinity of either active fishing grounds or survey locations. With the lack of scientific evidence showing that seismic activity does not have an impact on the biological strata. Page 162 indicates that there for previous Newfoundland & Labrador surveys has been a temporal and spatial separation plan; the FFAW would feel inclined for the proponent to indicate said occurrences. In the context of the surveys estimating the biological abundance, for the FFAW Science there is no such concept of adequate “quiet time” – the FFAW is unsure what is being implied and would like to reiterate that there be no activity in the areas of the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab.

The FFAW is only aware of the implementation of spatial separation of about 20 nautical miles having been discussed in the context of any recent programs in Newfoundland & Labrador. The FFAW therefore reiterates the concern that exposure to seismic activity can have an effect on harvested species. Any impact on surveys and/or stock assessments would have a lasting impact for harvesters. Although the proponent suggests that there would be no significant cumulative effects on the commercial fisheries from the seismic program (page 251). The FFAW is obliged to again state that any impact on either harvesting or fisheries science should be recognized as unacceptable in Newfoundland & Labrador waters.

SPECIFIC COMMENTS

Canada – Newfoundland and Labrador Offshore Petroleum Board

Section 2.2.5 Project Ships, pg 9 - It is mentioned in various places throughout the document that a “scout vessel” (pg 162) may also be used during the program. A “scout vessel” has also been identified as a mitigation measure (Table 5.2, pg 167). Please provide details on this vessel and what factors are considered to determine if and when this vessel will be utilized during the program. Also, how the information will be obtained to make a determination.

Section 4.6.1.5 White Shark, Page 134-135 – This section is lacking: the designation; critical habitat; recovery strategy; action plan; and management plan. Please provide.

Section 5.2.2 Program Consultations 2013, Page 147 – Did the in-person meetings planned for April occur? If so, provide details and if not, indicate why and if they are rescheduled.

Section 5.6, 4. Fishing Gear Damage Program, last para., last sentence, pg 163 – *“GXT understands that all such incidents must be reported to the C-NLOPB.....”*. Incidents must be reported “immediately” to the C-NLOPB.

Section 5.7 Effects of the Environment on the Project, 2nd para., line 8, pg 168 – *“Seismic vessels typically suspend surveys once wind and wave conditions reach certain levels because the ambient noise affects the data.”* More information is required on “certain levels”?

Section 5.8.5.1 Sound, Vessel Presence (including streamers) 1st para., line 5, pg 192 – *“Because of the length of the streamers....”*. Section 2.2.7, pg 13 states that the seismic ship will tow a single streamer.

Section 5.8.5.1 Sound, Vessel Presence (including streamers) 1st para., line 8, pg 192 – *“There will typically be no deployment of streamer outside the Project Area....”*. Streamer deployment can only occur within the Project Area assessed. “Typically” does not apply. The Project Area is the area in which seismic survey activities are to occur, including the area defined for line changes. Please confirm that this is the case. The EA has also confirmed that there will be *“No gear deployment enroute to Survey Area”* (pg 162).

Section 5.8.5.1 Sound, Vessel Presence (including streamers) 1st para., last sentence, pg 192 – *“The only circumstance under which the streamer would be deployed outside the Project Area in severe weather conditions. Sometimes retrieval of the streamer might not be possible and the seismic vessel may have to stay on the same heading for a couple days for the safety of the vessel and streamer.”* We would expect activities to be planned such that deployment outside the Project Area would not occur. Planning would include consideration of forecasts of severe weather. However, if conditions unexpectedly were

to deteriorate so that potentially threatening conditions prevented safe recovery of equipment, then safety considerations would prevail. If exceptional circumstances dictate that equipment cannot be safely recovered, then the C-NLOPB should be immediately notified and the energy source should be shutdown.

Section 5.8.6.1 Vessel Lights, 2nd para., line 11, pg 195 – “*e.g., 52 birds in three weeks on the Terra Nova drill rig; U. Williams, Petro-Canada, pers. comm.*”). Please provide the date of this pers. comm. and provide more recent data, if available.

Section 6.0 Cumulative Effects, pg 254 – “*However, offshore oil and gas activity on the Grand Banks should be far enough away to avoid any disturbance effects*”. Please discuss the potential effects if another seismic project is proposed in the Labrador Shelf area in 2013 and how GXT would mitigate potential negative effects.

Environment Canada – CWS

Section 5.6 Mitigation Measures, Page 165 "Wildlife Data Collection" - It is stated that seabird surveys (i.e. standardized counts) will be conducted throughout the seismic program from the seismic vessel by Marine Mammal Observers (MMO) experienced in the identification of seabirds at sea. It is stated that a schedule of conducting seabird surveys (likely three times per day) at widely spaced intervals will be followed.

The proponent must provide more detail on the schedule for conducting seabird surveys. If all MMO's on board the vessel are conducting marine mammal surveys during seismic operations, a minimum of 3 one-hour surveys (i.e., morning, mid-day, evening) per day dedicated to seabirds are recommended. In addition, dedicated seabird surveys should be conducted during transits between seismic lines. If one of the MMO's can be dedicated to seabird surveys during seismic operations, EC-CWS recommends more than 3 one-hour surveys per day be completed.

Section 5.6 Mitigation Measures, Page 165 "Wildlife Data Collection" - It is stated that a monitoring report will be submitted to the C-NLOPB within one year after completion of the surveys as per the C-NLOPB Guidelines.

EC-CWS requests to obtain the raw monitoring data as well as the report.

Fisheries and Oceans Canada

Section 4.2.1.1 Bathymetry, Page 23 - According to this section of the EA “Only a small proportion of the Study Area is composed of areas where water depths are less than 200 m (e.g., Saglek Bank, Nain Bank, Makkovik Bank, Harrison Bank, Hamilton Bank).” Yet, Section 4.2.1.2 states: “Figure 3.1 in Sikumiut (2008) displays the offshore Labrador surficial sediment distribution by soil type between the 200 m and 1,000 m isobaths in part of the Study Area.” Thus from these two sections it would appear that no information is presented and/or available with respect to sediment distributions within the “banks” (Saglek, Nain, Makkovik, Harrison, and Hamilton) that exhibit depths of $\leq 200\text{m}$. This would represent a significant gap with respect to the description of fish and fish habitat

within the study area. This is particularly true with respect to upwellings on the banks and their associated slope areas which usually represent the most biologically productive areas.

Section 4.2.1.4 Benthos, Deep Water Corals, Page 29 - Figures 4.13 and 4.14 from (Sikumiut 2008) and any other relevant figures/maps from Wareham (2009) etc...should be included in the EA report such that coral distributions can be related to the study area.

Section 4.2.2.1 Macroinvertebrate and Fish Species Harvested during Commercial Fisheries

Page 35 - Redfish. Stock delineation is based on management unit and not on biological features. This should be corrected in the fifth paragraph.

Page 39 - Atlantic Cod. The last paragraph of this section requires clarification as it refers to Cod as a "flatfish" species: "Atlantic Cod catches in the commercial fishery are incidental in other directed fisheries. During 2005-2010, the average annual catch weight for this flatfish was about 1 mt, twelfth overall (see Table 4.5 in Section 4.3.2.2)."

Page 40 - Atlantic Salmon. The first sentence should read that Atlantic Salmon likely pass through the study area" and not potentially. In the second paragraph, smolt age should be specific to the Labrador area and changed to "lives in fresh water for three to five years of life" and not "two years". The stock status information should also be updated using the most recent information available. Refer to the November 2012 DFO Science Advisory Process on Atlantic Salmon: http://www.dfo-mpo.gc.ca/csas-sccs/Schedule-Horraire/2012/11_19-21-eng.html.

Page 41- American Eel. In the last paragraph, "Newfoundland, including Labrador, is the most data-poor area of the American Eel's Canadian range, and has no data sets that indicate abundance trends or absolute abundance at any life stage." However, the EA should include a sentence indicating that based on current knowledge; it is likely that eels will occur seasonally in the study area of this project.

Page 42 - Arctic Cod. In the third paragraph, the following statement is out of date: "...however, large numbers have been obtained off Labrador by Soviet trawlers as a bycatch in the offshore Capelin fishery (DFO 2009a)..." It is recognized that the consultant refers to a DFO 2009 publication (Underwater World series published online) but the original pamphlet publications that are reproduced are presently very dated, particularly any descriptions of fishery activity. This applies to any other species in which fisheries related information is cited via the Underwater World series.

Page 40 - Sand Lance. It is thought that the section on Sand Lance can be removed as this species is not found in the study area. Refer to the previous

comment on the Underwater World series from which the information on Sand Lance was referenced in the EA.

Page 44 – Table 4.1. The statement in the “Duration of Plankton Stage” column of this table for “Redfish” (“No planktonic stage”) is incorrect. The larvae are frequently caught in plankton nets in surficial waters and there are many publications that can be referenced to support this point (e.g., Pikanowski et al., 1998 and Moser et al., 1991). Also, Capelin is included in Table 4.1 but a background section is not included in Section 4.2.2.1. A specific section on Capelin should be added to the EA as the project area is a key fall feeding area for this species.

Section 4.2.2.1, Redfish, Page 35 - Acadian and Deepwater Redfish are both mentioned here as being assessed as threatened by COSEWIC. It should be clear which designatable units of these redfish species are being referred to (Acadian Redfish – Atlantic? Deepwater Redfish – Northern?). For Acadian Redfish, the Atlantic designatable unit was assessed as threatened and the Bonne Bay designatable unit was assessed as special concern. For Deepwater Redfish, the Northern designatable unit was assessed as threatened and the Gulf of St. Lawrence/Laurentian Channel designatable unit was assessed as endangered. (See also note above)

Table 4.12, Page 112 - Under the SARA status column, Harbour Porpoise is included as Schedule 2 – threatened. Note that this is not an official status under SARA; Schedule 1 is the official list of SARA species. Schedules 2 and 3 were created to identify species that were remaining to be reassessed by COSEWIC using their revised criteria when SARA came into effect. Harbour Porpoise was reassessed by COSEWIC in 2006 using the revised criteria and they assessed it as special concern. Similarly on p. 121, the first sentence in the last paragraph should be revised, as Harbour Porpoises in the Atlantic are not considered threatened under SARA (i.e. they are not listed on Schedule 1).

Table 4.15, Page 130 - In this table, the designatable units of Deepwater and Northern Redfish should be specified.

Section 4.2.2.3 Macroinvertebrates and Fishes Collected during DFO Research Vessel (RV) Surveys, Page 45 - DFO RV spring surveys (Div. 3LNOPs) do not overlap with the study area (Div. 2GHJ3K).

Section 4.3.5 Recreational Fisheries, Page 96 - The seismic program will occur during the marine migration periods for Atlantic Salmon. Young Salmon (smolts) migrate through the study area from late-May through June and adult Salmon will return to fresh water from June through the end of September. There is no information specific to the study area regarding the impact of seismic activity on Atlantic Salmon migration. However, no overt scaring in Salmon exposed to high levels of sound has been reported in Coho Salmon (Ruggerone et al., 2008) and Atlantic Salmon (Andrews et al., 2013, unpublished manuscript and M.Sc. thesis).

Section 4.5.1 Marine Mammals

Page 112 - Table 4.12 - There is information in the literature that Ringed Seals feed pelagically in the summer and fall (check summer feeding research by Lois Harwood and others). Unpublished data on satellite tracking of Ringed Seals along the central Labrador coast indicates that these seals primarily feed in coastal areas within the Zone, but there is some activity (both presumed feeding and seasonal migration) between the eastern edge of the Zone and the 2000 m contour. Contact B. Sjare to confirm that a pers. comm. can be used. Consequently, the wording in the table under the habitat column should either focus on the ice-free period or include both summer and winter habitats.

Pelagic feeding habitats are mentioned else where in the text, so the table should be consistent in this regard.

Pages 115-116 – Figures 4.44 and 4.45 - The south coast of Labrador and the area east of the Strait of Belle Isle is very important for a number of species at certain times of the year. More attention needs to be paid to this area in terms of mitigation of project activities. There are also several spots along the slope edge that appear to be important for a number of species.

Page 119, and elsewhere - DFO does have minimum population estimates for many cetacean and pinniped species in Atlantic Canada. These are based on systematic surveys such as detailed in Lawson and Gosselin (2009), and Hammill and Stenson (2006 and 2010). These figures could be quoted in place of the National Oceanic and Atmospheric Administration (NOAA) estimates unless the latter include species for which the DFO surveys did not have enough sighting events to generate an acceptable estimate.

Section 4.6.1.6 Wolffishes, Page 135 - In the Northern Wolffish section, the information presented in the last paragraph should be referenced to Simpson et al. (2012).

Section 4.7 Sensitive Areas, Page 140 - Science Branch NL Region recently conducted a peer review advisory process on the identification of Ecologically and Biologically Significant Areas (EBSAs) in Labrador waters (refer to http://www.dfo-mpo.gc.ca/csas-sccs/Schedule-Horraire/2012/10_23-25-eng.html). Although the Science Advisory Report (SAR) from this process has not yet been published, much of the advice contained within this report is applicable to the 2013-2015 Labrador GXT EA, especially with regards to the identification of sensitive areas. DFO Science should be contacted by the proponent to determine the status and availability of this publication (even in draft form) to permit the timely incorporation of the SAR contents into the EA. Specifically, the Areas of Interest (AOIs) identified in the SAR should be include in the final EA document as a figure and the proponents must acknowledge them in the text with a clear statement that they will be considered for project mitigation.

Section 5.6 Mitigation Measures Page 164-165 - DFO recommends that the proponent employ multiple, trained MMOs in addition to the Fisheries Liaison Officers (FLO). This will enhance the efficacy of this type of mitigation, and the EA could benefit from more detailed descriptions of the MMO activities to ensure the reviewers that the best possible methods will be employed. This is important also with regards to MMO workload and opportunities for biological data collection.

Section 5.6 Mitigation Measures; Section 5 Marine Mammal Protection, Page 164 - The proponent clearly states that project activity including survey layout, location and to some degree timing will accommodate fishing activity, fishing gear and research surveys - which are all important (as are the safety zones and ramping-up procedures). However, the above mentions survey activity should also accommodate the occurrence of major seasonal, multi-species feeding aggregations of marine mammals and sea birds.

This is particularly the case when surveys are being conducted when visibility conditions are low and at night. Passive Acoustic Monitoring (PAM) is employed as a complement to visual observation when the latter monitoring technique is compromised by poor visibility or when marine mammals are below the surface or beyond visual range (DFO, 2010). PAM is a mitigation tool that has benefits in the sea conditions that prevail in the study area and should be discussed as a viable mitigation measure in this Section. In particular recent advancements such as the "WhaleWatcher" PAM system take advantage of the acoustic data stream from the seismic towed array to detect and track vocalizing marine mammals in real time at much less cost than installing and towing as dedicated towed array. DFO Science acknowledges that the benefits of PAM have been mentioned elsewhere in the EA.

Appendix 3 – Consultation Reports A. Labrador – Nunatsiavut Consultation Report

This document makes some rather definitive and imprecise statements: (i) effects on fish would only be expected within 1 m or so from a survey ship (page 5), (ii) there has been no measurable impact on fish stocks through surveys carried out in Newfoundland (also, page 5; but note that these effects have not been studied in this region yet, and behavioral effects on groundfish exposed to seismic sounds have been reported elsewhere [Engås et al., 1996a and 1996b]). Given the large area over which these sounds could be detected in excess of 1 m from the survey ship and elicit behavioral responses by marine organisms this statement is wrong. Likewise, given natural mortality and fishing, major or massive impacts would generally be required for seismic surveys before being scientifically detectable at the population level in any commercial species in the offshore. Therefore, as noted by others, laboratory and mesocosm studies are required for assessing potential harmful effects. It is important that this information be corrected.

Fish, Food and Allied Workers

Section 2.2.1 Objectives, Rationale and Alternatives, last paragraph - the word "though" should likely read *through*.

Section 4.2.1.3, page 26, second last bullet - it is suspected that "trends" should read *tends*.

Section 4.2.2.1 Macroinvertebrate and Fish Species Harvested during Commercial Fisheries, subsection American Plaice, Page 36 - In the section dealing with American Plaice there is a reference to SA2, without a qualifier of any kind. The term is used in the context of what appears to be NAFO region 3K, yet there is nothing clearly identifying this either. It is unfortunate that a document aiming to inform the reader of the environmental circumstance fails the clearly identify that which is being talked about. On page 37 there is a reference to SA2 without any qualifier what this is. Again on page 40 there is reference to “maiden 2SW salmon” and “SFA 1” are brought up without qualifiers, SFAs are not properly mentioned and depicted until on page 75.

Section 4.2.2.1 Macroinvertebrate and Fish Species Harvested during Commercial Fisheries, subsection Atlantic Cod, Page 39, paragraph four – the Atlantic cod is not a flatfish, please correct.

Section 5.6 Mitigation Measures, subsection Communications and Liaison, page 158, first paragraph - There is a need for clarity, or spell check, on the first full sentence on page 158 “...Project have indicate that frequent, timely...” (sic).

Section 5.6 Mitigation Measures, subsection Fisheries Avoidance, page 162, third paragraph - “GXT will not deploy is array or streamer ...” (sic.) the proponent would have to clarify what is implied with “is” in this instance.