

CGG Services (Canada) Inc. Newfoundland Offshore Seismic Program, 2016 to 2025 (LGL February 2016)

GENERAL COMMENTS

Fish, Food and Allied Workers (FFAW-Unifor)

The timing of the activity coincides with the highest harvesting activity of our Membership.

The correct convention for the areas would be NAFO Divisions 3KLMNOPs and 4Vs, not 3K, 3L, 3M, 3N, 3O, 3Ps and 4Vs. There are multiple cases of this error in Section 4.3 Fisheries

CGG Services (Canada) Inc. Newfoundland Offshore Seismic Program, 2016 to 2025 (LGL February 2016)

SPECIFIC COMMENTS

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

§ 1.0 Introduction, page 1 – the *Canada-Newfoundland Atlantic Accord Implementation Act* is incorrectly reference. It should be *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*. Please correct accordingly.

§ 2.0 Project Description, page 4 – what types of concurrent surveys may be conducted in any given year? Additionally, are these two types of surveys assessed and do the mitigations address and discuss the concurrent activity of the two surveys?

§ 2.2 Project Overview, page 5 –The maximum amount of 2D, 3D and/or 4D to be collected annually between 2017 and 2025 should be identified and included in the effects assessment.

§ 2.2 Project Overview, page 5 – There does not appear to be a discussion of the use of echo sounders and side scan sonar although it is identified as having potential interactions on various VECs in *Section 5.7 Effects of the Project Activities on the Environment*.

§ 2.2 Project Overview, page 5 – As per the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012), operators are expected to implement both a seabird and marine mammal observation program throughout survey activities. Such a program should involve a designated observer trained in marine mammal **and seabird** observations. This should also be addressed in the mitigation measures identified in *Table 5.1 Summary of Mitigations Measures by Potential Effect* on page 137.

§ 2.7 Environmental Monitoring, page 12 – there seems to be a lot of description for the MMOs and very little with respect to seabird observations. See comment above with respect to § 2.2 Project Overview.

§ 5.1.1.1 CCG’s Consultation Policy and Approach, page 132 – the title of this section and the beginning of the first sentence incorrectly identifies the proponent as CCG. Please correct to CGG.

§ 5.5.1 Summary of Mitigation Measures, Table 5.1, page 137 – Under “Fishing gear damage” one of the primary mitigations for this potential effect is the use of a “support vessel”. Will this be a dedicated vessel?

CGG Services (Canada) Inc. Newfoundland Offshore Seismic Program, 2016 to 2025 (LGL February 2016)

§ 5.9 Mitigation Measures and Follow-up, page 180 – “... activities by means of a CCG “Notice to Mariners” and a ... Please correct to CGG.

Fisheries and Oceans Canada (DFO)

§ 2.1 Spatial and Temporal Boundaries, page 4 and § 2.4.1.1 Physical Environment and Potential Effects on the Project, page 10 – Both sections describe water depths as ranging from “...<100 m to > 4000 m...” which implies all water depths. Reference to water depth should be corrected to indicate that it ranges between 100 and 4000 m this should be clarified accordingly.

§ 4.2.2 Fish – Northern Shrimp 2nd sentence 3rd paragraph, page 54 - the reference to “.....*snow crab*.....” in this sentence should be removed and replaced with “...northern shrimp...”

§ 4.2.3 Fish and Fish Habitat Data Gaps Identified in Relevant SEAs, page 60 - regarding the last sentence in this section “*Any new information that has been made available since the three SEAs were completed...*” there are two SEAs referenced in this section, as such the last sentence be amended to make reference to “...*two SEAs*....”.

§ 4.3.4 Traditional and Aboriginal Fisheries, pages 85-89 – there are a number of sentences (e.g. 3rd sentence 1st paragraph (page 85), 1st sentence 1st paragraph and last sentence 1st paragraph (page 89) that incorrectly reference “...*DFO, Resource Management and Aboriginal Affairs*.....” These sentences should be amended to refer to “...*DFO, Resource Management and Aboriginal Fisheries*.....”

§ 5.5 Mitigation Measures, page 136 – the 4th bullet should also include reference to the *Species at Risk Act*. This section should also note that the *Marine Mammal Regulations (MMR)* under the *Fisheries Act* is currently undergoing amendment. While public consultation on proposed amendments have only just recently ended it should be noted that Schedule 11 of the proposed amended *MMR* provide approach distances for marine mammals based on species, vehicle (vessel, aircraft, etc), area and timing. Given that the proposed seismic survey(s) are scheduled to run from 2016 to 2025 it is recommended that the proponent be aware of any potential implications that may arise if any proposed amendments to *MMR* are accepted during the timeframe covered by the proposed survey program.

§ 5.5 Mitigation Measures, page 137 – the last sentence of Section 5.5 (page 137) notes that “*Details of the seven mitigation categories are provided in § 5.5 of LGL (2015a, b).*” It should be noted however that six (not seven) mitigation categories are listed on page

CGG Services (Canada) Inc. Newfoundland Offshore Seismic Program, 2016 to 2025 (LGL February 2016)

136 and described in LGL 2015a and b, as such this sentence should be corrected appropriately.

§5.7.4.1 Sound, pages 141-144 – The 2nd sentence 3rd paragraph (page 143) which notes that “*Available experimental data suggest that there may be physical impacts on the fertilized eggs of snow crab and on the egg, larval, juvenile and adult stages of cod at very close range*” requires an appropriate reference. The 1st sentence 4th paragraph (page 143) which notes that “*Snow crab, thought to be sensitive to the particle motion component of sound only..*” requires an appropriate reference and since this is the first mention of particle motion a definition / description should be provided. The 1st sentence 6th paragraph (page 143) which notes that “*The physical effects of exposure to sound with frequencies >500 HZ are negligible, based on the available information from the scientific literature*” requires an appropriate reference.

§ 5.7.4.1 Sound (Fish and Fish Habitat VEC), pages 141-144 – this section should include a short summary discussion (similar in detail to that provided for physical effects) of the potential behavioural effects in fish in relation to seismic sound (*e.g.* startle response; change in swim speed, depth and direction; schooling; reproduction; recruitment; feeding) that are reported in literature including among others - Popper and Hawkins 2012 *Advances in Experimental Medicine and Biology* Vol 730 - and other project EAs and applicable SEAs. This will also provide support to the linkage to discussion on effects of seismic sound on Fisheries VEC noted in Section 5.7.5.1 of the EA Report.

§ 5.7.7.1 Sound (Marine Mammals and Sea Turtle VEC), pages 159-163 – with respect to the discussion of Masking while it is safe to say (see 4th sentence on page 160) that “*Based on past and current reviewed research, the potential for masking of marine mammal calls and/or important environmental cues is considered low...*” it is felt that this section should provide a short summary (similar to that provided on pages 161 and 162 for Disturbance, Hearing Impairment and Non Auditory Physical Effects) of some of the potential effects on masking that are provided within among others Erbe *et al* 2015 and Guan *et al* 2015.

§ 5.7.7.1 Sound (Marine Mammals and Sea Turtle VEC) – Disturbance, page 161 –the last sentence on page 161 “*Based on available data, it is likely that sea turtles would exhibit behavioural changes and/or localized avoidance near a seismic vessel*” requires a reference as well a very brief summary / description of “behavioural changes” that are likely to occur in sea turtles should be provided in this paragraph accordingly.

§ 5.7.7.1 Sound (Marine Mammals and Sea Turtle VEC) Hearing Impairment, page 162 – Regarding the 2nd sentence of the 5th paragraph examples of the “*Several aspects of the planned monitoring and mitigation measures for this project are designed to detect*

CGG Services (Canada) Inc. Newfoundland Offshore Seismic Program, 2016 to 2025 (LGL February 2016)

marine mammals and sea turtles occurring near the airgun array” should be provided either here or more likely in the discussion of project mitigations and monitoring (Sections 5.5 and 5.9). If monitoring other than visual monitoring of the 500 m safety zone is planned then the EA Report (e.g. Sections 5.5 and/or 5.9) should specify same and a linkage provided in the above noted 4th paragraph.

§ 5.9 Mitigation Measures and Follow up, pages 180-183 – the 6th and 7th sentences of the 3rd paragraph on page 182 note that “...observers will watch for marine mammals and sea turtles when the air gun array is active ..”and that “...the array will be shut down whenever endangered and/or threatened marine mammals or sea turtles are sighted within the safety zone”. That being said it is not clear what measures will be employed to monitor for SARA listed endangered and/or threatened mammals and sea turtles during periods of darkness and/or low visibility. This should be clarified accordingly.

Fish, Food and Allied Workers (FFAW-Unifor)

§ 5.7.4.1 Sound, page 143 - “In the case of eggs and larvae, it is likely that the numbers negatively affected by exposure to seismic sound would be negligible when compared to those succumbing to natural mortality,” is a very strong statement to make. It is noted that LGL identifies and acknowledges the data gaps existent in this base of knowledge and that “available experimental data suggest that there may be physical impacts on the fertilized eggs of snow crab and on the egg, larval, juvenile and adult stages of cod at very close range.” Therefore, the former statement is problematic as a sound knowledge set to back the statement up is lacking. Likewise, stating that spatial and temporal avoidance of key life stages, as well as ramp-up procedures, should mitigate these effects is unsatisfactory when we do not know the effects of seismic activity on these species.

Additionally, “Limited data regarding physiological impacts on fish and invertebrates indicate that these impacts are both short-term and most obvious after exposure at close range,” states the key issue – “limited data.” Until a more thorough examination has been made and conclusions have been agreed upon we cannot be sure that effects are indeed short-term.

Appendix A, page A-7 - Johan Joensen and Robyn Lee are identified as participants in consultation from our organization. Robyn Lee was the Petroleum Industry Liaison at time of consultation, not Johan Joensen as identified. Also, I, Dwan Street, was also present in consultation.