Nexen Energy ULC Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Program (2018 – 2027) (Amec Foster Wheeler June 2017)

GENERAL COMMENTS

Environment and Climate Change Canada (ECCC)

Please note that in addition to our earlier comments on the Scoping Document and Project Description are still applicable.

Groundfish Enterprise Allocation Council-Canadian Association of Prawn Producers (GEAC-CAPP)

To begin, this project is situated in a highly productive region of the Northwest Atlantic. The boundaries of the study area encompass very important Groundfish harvesting areas for a wide variety of species. Although this is acknowledged in the Environmental Assessment document, we are concerned that the potential impacts of invasive surveying techniques such as seismic exploration are not adequately assessed, nor is the long term risk truly considered.

As we have indicated in past submissions on seismic exploration, the relationship between seismic activity and the behavior of shrimp and Groundfish is poorly understood. We have experienced substantial changes in catch rates and resource distribution associated with nearby seismic activity and feel that this EA does not adequately consider those risks. The study area encompasses many different marine environments and fisheries, but the assessment is narrowly focused and returns with the assessment of 'negligible to low' risk on fish species, fisheries and their habitats. This is clearly an over-extension of assessment given the paucity of scientific knowledge on the impacts of such intrusive activities.

As we have noted in other EAs, the document suggest that no fisher will be required to relocate based on the exploration activities. We question this conclusion, especially given that we have observed substantial reduction in catch rates of both shrimp and Groundfish as a result of seismic testing within the general vicinity. This means that although a seismic survey vessel may not force us to immediately relocate to avoid the survey vessel, the resultant impacts of fish distribution from the seismic pulses will cause us to significantly alter our fishing plans – even leading us to abandon some areas for several months.

We again request that the EA include some parameters on the avoidance of activity, to be determined through direct discussion with ourselves and member companies. This avoidance should include both a spatial and temporal element to allow our harvesting activities to continue without reductions in catch rates.

We suggest that there is not sufficient information in this document to adequately assess the impacts of seismic exploration on shrimp and Groundfish behavior and distribution (and thus the catch rates experienced by our operators). Without this information, we must proceed a in a precautionary manner that respects existing ocean users while maintaining a path to allow exploration and resource development. We submit these comments based on our past experience with seismic exploration near our harvesting grounds. This experience has generally not been positive and we seek to improve our relationships with the oil and gas exploration industry such that the benefits of our oceans can benefit all sectors.

Fish, Food and Allied Workers (FFAW-Unifor)

The overall study area for this EA is quite large as is the temporal scale of the project (2018-2027). While current fisheries data has been examined in the document it needs to be recognized that the fishery could change dramatically over the span of this ten year project. Our fisheries science work is likely to change as well. It is critical that effective and regular communication ensue with the fishing industry, as committed in the EA, throughout the EA lifespan so that the proponent is kept apprised of ongoing developments with fisheries in the project area.

A common mitigation measure noted in many Environmental Assessments is that seismic vessels avoid areas that are actively being fished. This requires planning prior to seismic activity being conducted (pages 318-319) as well as regular communication with the fishing industry throughout the fishing season. It is therefore critical that effective and regular communication ensue with the fishing industry throughout the EA lifespan so that the seismic company is kept apprised of ongoing developments with fisheries in the project area.

As a mitigation, it is also important to clarify that the Fisheries Liaison Officer (FLO) onboard the seismic vessel be the one to communicate with fish harvesters on the water, not the crew of the standby/guard vessel (pages 13, 262, 320).

SPECIFIC COMMENTS

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

Section 1.3 Regulatory Context and Environmental Assessment Requirements, pg 3 – The *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* were updated in September 2017.

Section 2.3 Seismic Surveys, pg 11 – It is stated that "up to an estimated 15" streamers may be used for 3D programs. For clarity, is this the maximum that is considered in the assessment of potential effects?

Section 2.3 Seismic Surveys, pg 11 – The statement "*Where multiple streamers are planned ...and other parameters and technical considerations*." For the purpose of assessment, details on the 3D streamers (e.g. tow depths, length, separation distance) must be provided.

Section 2.6 Project Schedule, 4th line, pg 13 – The statement "*Project activity will **generally** occur within the April to November period...*". For the purpose of assessment, the actual months in which the project activities are proposed must be identified for the purpose of assessment.

Section 2.7.3.1 Liquid and Organic Discharges, pg 16 – Please clarify the "... and possible others."

Section 3.4.7 Cumulative Environmental Effects, Table 3.6, pg 35 – Information on the "Hebron Oilfield" should be updated.

Section 4.2.2.6 Key Areas and Times for Marine/Migratory Birds, 1st sentence, pg 141 - EBSAs are in the Newfoundland and Labrador Shelves Bioregion not the PBGB LOMA.

Section 5.3 Environmental Planning, Management and Mitigation, pg 297 – Appendix A Table of Concordance states that the review and evaluation of best mitigation practices is contained in Section 5.3 and Section 6.0. Please provide details on this review and on any new and/or existing techniques that have been considered for the program.

Section 5.1 Project Components, Activities and Key Environmental Considerations, pg 254 – What types of multiple surveys may be conducted concurrently by Nexen in any given year? Please clarify if more than one seismic program may be executed concurrently in any given year, and if so have they been included in the assessment of activities.

Section 5.1 Project Components, Activities and Key Environmental Considerations, pg 255 – Please provide more details on gravity and magnetic data activities to support the statement that "*these activities are not likely to interact with or otherwise adversely affect the VECs*".

Section 5.3.2 Required and Planned Mitigation Measures, 6th bullet, pg 260 – The Operational Monitoring Program Design should be made available to both the C-NLOPB and DFO.

Section 5.3.2 Required and Planned Mitigation Measures, pg 262 – Please confirm if a standby or guard vessel will continuously accompany the seismic vessel.

Section 5.4.2 Potential Environmental Issues, Interactions and Existing Knowledge, Table 5.1, pg 265 – Table 5.1 shows no interaction between the presence and use of vessels/aircraft and equipment and feeding (availability and quality) yet in Table 5.2 this interaction is discussed. Please clarify.

Section 5.5.5 Environmental Monitoring and Follow-up, pg 291 – Please define what is meant by "A qualified and Experienced Environmental Observer..." For clarity, such reports are due six months after the completing of any survey.

Section 5.6.5 Environmental Monitoring and Follow-up, pg 302 – Two separate people should be observing marine mammals and marine birds to ensure accurate counts and the employment of all mitigations. For example, if a check is being made for stranded birds, it is possible that marine mammals, and potentially *SARA* listed species may enter the 500 metre zone.

Fisheries and Oceans Canada (DFO)

Section 3.4.7 Cumulative Environmental Effects, pg 35 – Regarding "…concrete GBS which is being constructed at Bull Arm…" should be updated.

Section 4.2.4 Special Areas, pgs 157-171 – The report mentions areas protected under "agreements" due to their ecological characteristics or importance – voluntary fisheries closures should be included in this section.

Section 4.2.4.1 Canadian (Federally) Identified and Designated Areas, Fisheries Closure Areas within Canada's Exclusive Economic Zone, pg 158 – Additional Fisheries Act Closures that should be listed include:

- The Hawke Channel;
- Lobster closures established to protect lobster habitat that are located on the Eastern side of Newfoundland (i.e., Gander Bay, Glovers Harbour, Gooseberry Island, Moose Island);
- Crab closures and conservation areas closed to protect crab habitat on the Eastern side of Newfoundland (i.e., Bonavista Bay Exclusion Zone A, Bonavista Bay Exclusion Zone B, Crab Trinity Bay Exclusion Zone A, Crab Trinity Bay Exclusion Zone B, Crab Nearshore Conservation Exclusion Zone, Crab Conception Bay Exclusion Zone, Crab Eastern Avalon Exclusion Zone, Crab Southern Avalon Exclusion Zone, Crab Area 8Bx Conservation Zone, Crab Area 9a Exclusion Zone);
- Proposed Fisheries Act closures (Hopedale Saddle and Tobin's Point). Fisheries and Oceans Canada are currently consulting with stakeholders on these areas, which are proposed for the end of 2017.

Section 4.3.1.7 Aboriginal Fisheries, bullet d, pg 233 – This document should include swordfish for Miawpukek First Nation.

Section 5.3.2 Required and Planned Mitigation Measures, pg 261 – Regarding "*Should such organisms be observed on-site during conduct of the field program, the relevant technical crew and Nexen representatives will discuss to determine the appropriate mitigation approach.*", will the technical crew and Nexen representatives be trained in identification of sensitive benthic species?

Section 5.4.2 Potential Environmental Issues, Interactions and Existing Knowledge, pg 265 – Regarding "*Studies indicate that plankton, eggs or larval mortality (if it occurs) would be limited to within a few metres of a seismic array*." should have a reference. There is also evidence for mortality of plankton, eggs or larvae at distances further than a few meters – this should be mentioned.

Section 5.4.2 Potential Environmental Issues, Interactions and Existing Knowledge, pg 266, Table 5.2 –In the "Summary of Existing Knowledge" and throughout, the method used to describe the amplitude of the sound pressure level should be included, e.g. root-mean-square (RMS), peak to peak, or peak. Also, in selected examples of studies where damage to fish from seismic sound has been noted (page 272) - the distance from the sound source should be included in these examples.

Section 5.4.3 Environmental Effects Assessment, Table 5.3 page 278; Table 5.9 pg 300; Table 5.17 pg 321 – Regarding the "Certainty" rating of "H", for "Seismic Sound", given the knowledge gaps associated with effects of seismic sound - recommend changing the rating from "H" to "M to H" for Fish and Fish Habitat and Marine Fisheries VECs and changing to "M" for Marine Mammals and Sea Turtles VEC.

Section 5.8.3 Environmental Effects Assessment, pgs 311-315:

- This section focuses on how the activities proposed for the Project will not interact with the seabed and benthic animals, but does not address impacts to pelagic organisms. Please describe potential effects on pelagic species;
- This section addresses the 'short duration' of contact which will occur with the seafloor but does not discuss potential impacts to fragile, long lived, slow growing sponges and corals or the recovery time for these organisms. Please describe potential impacts to corals and sponges, including recovery time, and any significant adverse effects;
- The report does not acknowledge the known impacts of seismic testing on zooplankton, krill and other small marine crustaceans such as copepods (Day et al., 2010 and Neo et al., 2015), which are important food sources for many marine fish, marine mammals and seabirds. Please describe potential impacts to these species and any significant adverse effects.

Fish, Food and Allied Workers (FFAW-Unifor)

Section 5.1 Project Components, Activities and Key Environmental Considerations, pg 255, 7th bullet AND Section 5.9.2 Potential Environmental Issues, Interactions and Existing Knowledge, pg 317, 2nd bullet - "*Reduced access to preferred fishing...areas during survey activities in certain locations, with possible decreases in activity success, efficiency, value or enjoyment*" was mentioned as an environmental consideration in this assessment. It is not clear what mitigation measures will be employed to mitigate these potential effects. We request clarification in this instance.

Section 5.9.3.2 Seismic Sound and Other Potential Emissions (Routine or Accidental), Table 5.17, pg 321 - The unknown long term effects of seismic activities continue to concern fish harvesters. 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 the current fishing season and/or for 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. As such, we would challenge the magnitude of the effect on seismic sound on marine fisheries to be "Low", not "Negligible" as reported in Table 5.17.

Environment and Climate Change Canada (ECCC)

Section 4.2.2.5 Species at Risk and of Conservation, Table 4.18, pg 129, Barrow's Goldeneye - Change "does not breed" to "occurs in and may breed" in Newfoundland.

Section 5.5.3.2 Seismic Sound Energy, pgs 286-290 - Though there is little evidence that marine birds are adversely affected by marine geophysical surveys, the reverse is also true; there is little evidence that marine birds are not adversely affected by marine geophysical surveys. Further research is required to support either position. ECCC-CWS recommends revising this section to remove speculation.