

Canada – Newfoundland Labrador Offshore Petroleum Board

§ 1 Introduction, 5th paragraph, page 1 – it should be the *Canada-Newfoundland Atlantic Accord Implementation Acts*.

JEBCO – Corrected. The “s” has been added to “Act”.

§ 2.1 Project Name and Location, pg 5 – There should be consistency in terminology throughout the report regarding the Project Area. The first acquisition phase Project Area (2015) is also referred to as “Phase One” on page 6.

The “Project Area” should be defined as per the C-NLOPB December 8, 2014 *Bridgeporth Holdings Ltd. North Flemish Pass Gravity Survey 2015-2019 Scoping Document* which states that the Project Area is the area in which gravity and magnetic survey activities are to occur, including the area of the buffer zone normally defined for line changes.

The “Study Area” is the area which could potentially be affected by project activities beyond the “Project Area”.

Both areas should be delineated to reflect project activities proposed between 2015 and 2019.

JEBCO- Text has been modified.

Table 2.1, page 5 – The C-NLOPB is not aware of Bridgeporth acquiring data in 2014. Shouldn't the coordinates identify the “2015” Project Area and not the “2014” Project Area? Also, as per the previous comment, “Project Area” should be replaced with “Survey” or “Program” Area.

JEBCO – Text has been modified

Figure 2.1 Project Activity Area, pg 8 - The 2015 program/survey area should be included on this figure.

The reference for the “SEA Boundary” should be provided. It does not appear in the Figure nor in the text of the report.

JEBCO – As noted in §2.2, the program/survey area for 2015 is not defined at this time. When a survey area is defined for each survey, the C-NLOPB will receive the information, as required, with the Application for Geophysical Authorization Program.

The SEA boundary, the Project Boundary, and the Study Boundary are identified on Figure 2.1. The SEA is referenced on pages 16, 31, 41, 44, 46, 48, 49 and 54. These same boundaries are also depicted in Figure 4.1.

§ 2.2.2 Project Scheduling Phase 1, pg 6 - There appears to be some duplication and/or overlap in the information presented in Sections 2.2.2, 2.2.3, and 2.2.5. There does not appear to be a Section 2.2.4. This should be reviewed and the information clearly presented.

JEBCO- This information has been simplified.

§3 Scope of the Assessment, pg 15 – The Scoping Document included in Appendix A is the Draft Scoping Document. The Scoping Document was finalized on December 8, 2014.

JEBCO – The final Scoping Document has been appended.

Table 4.2, Marine Fish and Shellfish page 22 – while the air to water interface sound transmission may be poor, or low, the fact that there is no effect on marine fish or shellfish is untrue. Some fish will surface, particularly the Endangered Great White Shark, and some shellfish inhabit surface layers of the ocean during some of their life stages. Fish and SAR fish need to be discussed.

JEBCO – During a meeting with the C-NLOPB on clarification of the scoping document, the inclusion of fish and shellfish was discussed relative to a project that is airborne. This lack of direct interaction was acknowledged and JEBCO was advised to dismiss the VEC in the EA report. Two world renown researchers were approached to consult on this topic. Dr Doug Cato, and Dr. Arthur Popper. Dr. Cato is a Principal Scientist Marine Environment, Maritime Division of the Defence Science and Technology Organisation. Dr. Cato is also Adjunct Professor in the School of Geosciences at the University of Sydney and the University of Sydney Institute of Marine Science. He is a Fellow of the Acoustical Society of America. He has more than forty years of experience in research in sonar performance particularly the way it is affected by ocean acoustics and is best known for his achievements in understanding the ambient sounds of the ocean. He was responsible for the "Cato Curves" of ocean noise which have been used extensively for predicting sonar performance, particularly in Defence for more than 30 years. He now leads a major project in collaboration with scientists from a number of universities on the impacts of anthropic noise on whales. He was asked if he had addressed the issue of aircraft flights over fish or shellfish to which he replied that he have not been involved in anything like that and he could not think of anyone who has. Dr. Cato surmises that effects on fish and shellfish depends on how often the fly overs occur, but given the short time that there would not be significant noise in the water.

Dr. Popper's research has primarily involved the study of hearing by aquatic organisms. Most work focuses on fishes, although studies have been done with other non-mammalian vertebrates. The fish studies have focused on various aspects of hearing that range from behavioral investigations to determine what an animal can hear to physiological investigations of the responses of the ear and brain. The majority of his work is now involved with studies on the effects of human-generated (anthropogenic) sound on aquatic organisms. This has resulted in a series of studies that explored behavioral and physiological effects of increased ambient sounds on fish. These studies have asked about effects of seismic air-guns, pile driving, and general increases in background sound levels on fish hearing and physiology. Over the past several years, he has been involved in the organization of several international meetings (2007, 2010, 2013 and 2016) on the Effects of Noise on Aquatic Life. For the past several years he has been working with colleagues from around the world to develop "guidelines" on the effects of noise on fishes and sea turtles. He commented that he has no knowledge of any effects studies on fish or shellfish larvae from low flying aircraft over water. He stated that the likelihood of impact on things under the surface is far less because of the acoustic interface between air and water since most of the acoustic energy bounces off the surface and does not get into the water.

§5.2 Geology, pg 28 – The reference for YOLO 2012 should be provided.

JEBCO – The reference was provided, albeit misplaced, in Section 7 and it is now in proper alphabetical order.

§ 5.8.4.1, page 48, second paragraph second sentence – The statement about EBSA identification needs a DFO reference.

JEBCO – DFO 2013 has been added.

§5.8.5.1 Ecologically and Biologically Significant Area (EBSA), 2nd para., pg 50 – It is stated that six EBSAs overlap the Study Area however only 4 are discussed. Table 5.4 on page 52 lists five.

JEBCO – The text has been modified.

§5.8.5.3 NAFO Fishing Closures, pg 53 – The NAFO Fishing Closure area locations within the Study Area should be included on a figure.

JEBCO – Text is revised to refer to the NS SEA document.

§5.9.5 Petroleum Industry, pg 60 – The Call for Bids information in this section is dated. The results of the listed Call for Bids were released by the C-NLOPB before December 14, 2014.

The reference to any bid areas is removed.

§6.1.4.1.1 Physical Displacement, 2nd para., pg 64 – The use of personal communication requires a source.

JEBCO - In a previous EA review in 2014 by C-NLOPB, the comment was made to remove all specific (name) source information in personal communications and to make reference only to a department and a generic position. Following that instruction “Canadian Wildlife representative” is provided.

§ 6.4.4.2 Marine Mammals at Risk, page 85 – Sowerby’s beaked whale and the Fin whale need to be discussed here.

JEBCO – Information on the species was obtained from DFO’s species specific recovery strategies, action plans or management plans. Unfortunately no such documents which provide DFO’s in-depth effects reviews exist for the Sowerby’s beaked whale or fin whale. Text has been added for Sowerby’s beaked whale and fin whale based on recent information since the submission of this report in January.

§6.5.1 Boundaries, pg 88 – This is the first time yearly seismic surveys are mentioned. If there is intent to conduct a seismic survey, please elaborate.

JEBCO – Correction made in the text to gravity surveys.

Fisheries and Oceans Canada (DFO)

§ 2.1, Project Name and Location, page 5 - The Coordinates of the “Project Area” in Table 2.1 are given for 9 corners, which is not clear since there are 4 corners of the “Project Area” presented in Figure 2.1 on page 8. Clarification of the “Project Area” coordinates as noted in Table 2.1 is required.

JEBCO – Coordinates of the Project Area boundaries are corrected.

§ 2.3.3 Project Activity Area, page 8 - Figure 2.1 should include a scale for distance in the legend of this and other similar Figures presented throughout the EA Report. Figure 2.1 (page 8) and Figure 4.1 (Page 19) should be amended to depict areas noted within the project description (see page 1) i.e. Flemish Pass, Jeanne d’Arc Basin, and NE Newfoundland Slope.

JEBCO – Figure 5.1 provides the names of the offshore areas. Scale provided on Figure 2.1.

§ 2.5.1 Noise Emissions, page 11 - Regarding the statement referencing data presented in Figure 2.2 “While cruising at altitude maximum sound level is 82 dB re 20uPa at <500Hz.” The ‘solid box’ depicting P3 at cruise shows maximum sound level at 90 dB re 20uPa <500Hz, which is more than the occupational noise exposure limit of 85 dB re 20uPa. This should be clarified. Figure 2.2 Legend is not clear. It seems logical that “P3A Cruise” represents a cruising P-3, but what does “F18 88% Cruise”, “AV8B”, “S3A”, “C130E” represent? It should be written in the Footnote.

JEBCO - A P3 is a turbo prop aircraft similar to the DC3 aircraft, although the former is larger. Based on industry consultation, there appears to be no available sound spectragrams for the aircraft proposed for this survey. The other graphic information represents other military aircraft types which are not relevant to the discussion. The legend is provided as excerpted from the source document as raw data are not available to recreate the graph.

Noise exposure limit for human at 85 dB re 20uPa is based on 8 hours duration of exposure.

§ 4.1.2 Spatial Scope, page 19 - With respect to Figure 4.1 it is assumed that the 'green dashed line' represents Canada's EEZ and the line should be labelled as such. The legend for Figure 4.1 should also include a scale for distance.

§ 5.8.2 Marine Mammals, pages 46 – 47 - Just making reference to summary data in the ENSEA 2014 without noting marine mammals known to be present within the study area is not sufficient. It is felt that this section should at least provide a list of marine mammals present in the Study Area. Regarding Figure 5.9 the date range that the data represents should be included.

JEBCO – text added and dates provided.

§ 5.8.4 Species at Risk, page 48 - When referring to SARA listed species the population/designatable unit should also be identified. The applicable population/designatable unit of Leatherback Sea Turtle is the Atlantic Population. The applicable population/designatable unit of Blue Whale is the Atlantic Population, not the NW Atlantic Population. The correct name is North Atlantic Right Whale, not the North American Right Whale.

*JEBCO – “Recovery Strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada” is the correct citation according to Beauchamp et al 2009. The Atlantic population of blue whale is designated in the marine mammals section below. Right whale is corrected. North Atlantic right whale and Sowerby’s occur only in the Atlantic, and thus not critical to the EA report to make a distinction from other regions where these species do not occur.*

§ 5.8.4.1 Marine Mammals, page 48 -The Northern Bottlenose Whale (Scotian Shelf Population) is included in Section 6.4.4.2 of this document, therefore, it should also be included in this section. With regards to the first sentence in the third paragraph in this section - “critical habitat” as defined by the Species at Risk Act (SARA) is the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or action plan for the species. The term “important habitat” may be more applicable in this case and the above noted section amended accordingly. With regards to the last sentence in the third paragraph in this section, please correct the text according to the following comments. Sei Whale (Atlantic Population) is not listed on Schedule 1 of SARA and is assessed as Data Deficient by COSEWIC. Humpback Whale (Western North Atlantic Population) is not listed on Schedule 1 of SARA and is assessed by COSEWIC as Not at Risk. Harbour Porpoise (Atlantic Population) is not listed on Schedule 1 of SARA and is assessed by COSEWIC as Special Concern.

JEBCO – Text has been modified.

§ 5.8.4.2 Sea Turtles, page 49 - While the Loggerhead Turtle is assessed by COSEWIC it is not listed on Schedule 1 of SARA.

JEBCO – Text has been modified.

§ 5.8.5 Sensitive Areas, page 49 - Last sentence indicates that “There are no migratory bird sanctuaries located offshore Newfoundland”. This sentence should be amended to note that, while outside the study area / project area, there is in fact an “offshore” migratory bird sanctuary at Funk Island. While not likely intentional it may be a bit misleading to not at least mention this area especially given that Figure 5.10 notes a number of EBSAs that are located outside the study area / project area.

JEBCO – Text has been modified.

§ 5.8.5.1 Ecologically and Biologically Significant Area (EBSA), page 51 -Regarding Figure 5.10 "Locations of the PBGB LOMA..." This caption is poorly worded and confusing. Something like this may be better (with a more adequate legend on the map). "*Ecologically and Biologically Significant Areas and the Bonavista Cod Box Relative to the Study Area.*" Also the Map symbology portrays the Cod Box and EBSAs with the same symbol. These areas are of different classes and should be represented differently (e.g. EBSA with one patch and fill and Cod Box with another) on Figure 5.10 with appropriate notation in the figure legend. Also with respect to Figure 5.10 there should be a different symbol (color, hatch pattern, etc.) for PBGB LOMA EBSAs, NL Shelves EBSAs and as noted above for the Cod Box.

JEBCO – This comment is a personal opinion on graphics.

§ 5.9.1.2 Harvest Season, page 54 - Figure 5.12 is missing the 12th month and so, the data illustrated in the figure does not correspond to the preceding text which describes the percent landings. Please correct.

JEBCO - Graph adjusted

§ 6.2 Marine Mammals, page 67 - First paragraph - regarding the statement "*However, Fisheries and Oceans Canada did not provide comment to C-NLOPB on marine mammals in its review of the project description.*" The review of the Project Description and Draft Scoping Document was not intended to be a detailed review of the existing environmental components and/or a detailed review of potential effects. That is the intention of the project EA report. The review of the project description and draft scoping document was intended to identify (to the CNLOPB) that DFO is in possession of expert knowledge and advice related to fish, fish habitat, marine mammals, species at risk and fisheries that may inform the project environmental assessment. This statement should be removed.

JEBCO – Statement removed

§ 6.2.4.1 Aircraft Presence/Noise Emission, page 72 - A legend is required for Figure 6.1 as well as a scale for distance. Given that the proposed survey is scheduled to take place from 2015 – 2019 it is important to note there may be considerations resulting from proposed amendments to the *Marine Mammal Regulations (MMR)*. While not finalized, although public consultation has ended, of particular interest may be a proposed amendment to Section 7.2.(1) which includes:

(1) When an aircraft is being operated at an altitude of less than 304.8m (1,000 feet) within a one-half nautical mile radius of a marine mammal, no person shall perform a flight manoeuvre – including taking off, landing or altering the course or altitude of the aircraft – for the purpose of bringing the aircraft closer to the marine mammal or otherwise disturbing it.

It is recommended that the proponent be aware of any potential implications that may arise in relation the acceptance of proposed amendments to the *MMR* during the proposed survey timeframe.

JEBCO – The figure contains the scale. The purpose of the figure is only to illustrate that there are aerial surveys over marine waters of Newfoundland and Labrador. The author reference provided directs a reader to explore more detailed information. Regulatory context in §1.3 lists the Fisheries Act which contains the Marine Mammal Regulations. As importantly noted, when the proposed amendment is legally examined, registered, and publicized in the Canada Gazette it will be addressed in any future EA updates. Such information is important to obtain from DFO in its contribution to the scoping exercise and participation in consultation efforts by the proponent.

§ 6.2.4.1.1 Hearing Abilities and Sound Production, page 72 - Last paragraph page 73 - regarding "*Nowacek et al. (2007) and Richardson et al. (1995) provide good reviews of the knowledge of anthropogenic noise effects on marine mammals.*" It would be advisable to also reference, and include

relevant information from, more recent work on the effects of noise on marine mammals (e.g. *The Effects of Noise on Aquatic Life* (edited by Arthur N Popper and Anthony Hawkins) in: *Advances in Experimental Medicine and Biology* 730, Springer Science + Business Media, New York 2012 pp 695). The last two paragraphs on page 73 including the last sentence on page 73 are confusing. The last sentence notes that "Aircraft noise is not in the levels that could induce temporary or permanent threshold shifts in marine mammal hearing." The level of aircraft noise and the type of aircraft generating the noise are not clear. Does it refer to the plane(s) to be used for the proposed survey and the level of sound / noise generated by such planes as described earlier in Section 2.5.1 (see Table 2.3 page 12)? Also it is not clear what is meant by "levels that could induce temporary or permanent threshold shifts". These two uncertainties should be clarified? First paragraph 2nd sentence page 74 – it should be noted that Table 5.2 does not provide any information for fixed wing aircraft, this oversight should be corrected and relevant information added to Table 5.2 as necessary. Regarding the sentence "Figure 6.2 shows noise frequencies levels generated from ships, aircraft and sonar relative to hearing sensitivities of marine life." "Jets" are shown in Figure 6.2 which has a dominant frequency range close to 1 kHz, higher than the dominant frequency of the proposed aircraft type for the study. The dominant frequency range for a twin engine aircraft should be indicated on the figure.

JEBCO – Text modified

§ 6.3.4.2 Noise Emissions, Sea Turtles, page 81 - This section should also include reference to more recent work by "Piniak, Mann, Eckert and Harms. 2012. Amphibious hearing in sea turtles in: *The Effects of Noise on Aquatic Life* (Popper and Hawkins, eds.) Springer, New York p83-87.", which describes the in-air and in-water sensitivity of adult and juvenile sea turtles (*Chelonia mydas*) to stimuli of varying frequencies. The last sentence page 81 - "This range would be with that sound level produced by the aircraft." Should be changed to "This frequency range would be within the same frequency range produced by the aircraft." "Sound level" refers to the sound pressure level, not the frequency. 6th line page 82 - the statement "Therefore, as aerial surveys are an acceptable method for sea turtle population study by reputable research institutions, it is reasonable to conclude that there are no anticipated significant adverse effects upon sea turtle hearing from the gravity survey either." While aerial surveys are widely used for population estimates of marine mammals and sea turtles, it is incorrect to conclude this would mean no significant effect on sea turtle hearing would result from the current survey: this conclusion should be based on the environmental assessment for the proposed project. This sentence should be reworded or removed accordingly.

JEBCO – text modified

§ 6.4 Species at Risk, page 83 - When referring to SARA listed species the population/designatable unit should also be identified. The applicable population/designatable unit of Blue Whale is the Atlantic Population. The applicable population/designatable unit of Fin Whale is the Atlantic Population. The applicable population/designatable unit of Northern Bottlenose Whale is the Scotian Shelf Population. The applicable population/designatable unit of Leatherback Sea Turtle is the Atlantic Population. Harbour Porpoise (Atlantic Population) is not listed on Schedule 1 of SARA and is assessed by COSEWIC as Special Concern. Killer Whale (Northwest Atlantic/Eastern Arctic Population) is not listed on Schedule 1 of SARA and is assessed by COSEWIC as Special Concern. Loggerhead Turtle not listed on Schedule 1 of SARA and is assessed by COSEWIC as Endangered.

JEBCO – Comment addressed above for comment 6.4, page 83.

§ 6.4.4.2.2 Noise Emissions, page 85 - Second sentence 1st paragraph - "Initial studies have established that noise generated from offshore operations present a low risk to marine life....." Please provide a reference for the "initial" studies used to make this statement.

JEBCO – Sentence removed to focus on aircraft studies.

§ 6.5 Sensitive Areas, page 88 - While four EBSAs are listed as being in the Study area, it should be noted that there are in fact 5 EBSAs located within the study area. The Orphan Spur (included in Figure 5.10 and Table 5.4 (page 51 and 52 respectively)) has been omitted. It is felt that Section 6.5 should be amended to include the Orphan Spur EBSA.

JEBCO – Orphan Spur is included.

§ 6.5.4.2 Noise Emissions, page 89 - The statement “*Sound generated by seismic surveys has been deemed not to be significantly adverse to marine wildlife by regulators in the region*” is not accurate or totally correct. A scientific peer review process led by Fisheries and Oceans Canada in 2004 considered the most current evidence of the impacts of seismic sound on marine life. The findings concluded that there was evidence that at certain received sound levels, behavioral changes can occur in some marine fish, marine mammals and sea turtles, with the greatest potential in close proximity to the source. A number of measures for mitigating the potential impacts of seismic sound were identified, agreed to, and subsequently incorporated by federal, provincial governments into the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* which has become an integral element of the design and conduct of seismic programs in NL marine offshore areas. The sentence should be amended accordingly.

JEBCO – The sentence is removed to focus on aircraft.

§ 6.6.4.1 Aircraft Presence, page 91 - First sentence 2nd paragraph – notes that “*Effects on seal behavior from aircraft noise and aircraft presence are discussed in Section *.*” The sentence should be amended to provide the Section number where this is discussed.

JEBCO - 6.2.4.1.2

Environment Canada

§ 5.8.1.4 Migrating Shorebirds and Passerines, page 44 - “Night migrations in the Survey Area will not be affected, as the aircraft will operate solely during daylight hours. The aircraft is likely to fly between the airport and the Survey Area before sunrise to commence low-level flights at first light.”

It is stated both that the aircraft will operate solely during daylight hours, and that the aircraft will fly to the Survey Area before sunrise. It should be clarified as to whether or not the proponent intends to fly during periods of darkness.

JEBCO – the aircraft will operate in the Survey Area in daylight hours only.

§ 5.8.4 Species at Risk, page 48 - “Species are listed under SARA on Schedules 1 to 3 with only those designated as endangered or threatened on Schedule 1 having immediate legal implications.”

Species of Special Concern have legal implications. It is likely that the proponent is referring to the General Prohibitions (sections 32 - 36) of the Species at Risk Act, which apply only to species listed under the *Species at Risk Act* (Schedule 1) as Endangered, Threatened, or Extirpated.

JEBCO – Comment noted.

§ 5.8.4 Species at Risk, page 48 - The recovery strategy for Ivory Gull should be cited as: Environment Canada. 2014. Recovery Strategy for the Ivory Gull (*Pagophila eburnea*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv+ 21 pp.

This recovery strategy can be obtained at <http://www.sararegistry.gc.ca>.

JEBCO – updated reference from 2013 (proposed) to 2014 (final).

§ 5.8.4 Species at Risk, page 48 - Stenhouse 2004, though a valuable reference, has been superseded by the Ivory Gull Recovery Strategy (2014). See above.

§ 5.8.4 Species at Risk, page 48 - "Ivory Gull is designated as endangered by both SARA and COSEWIC," It should be noted that COSEWIC assesses species, SARA designates (or lists) species.

JEBCO – Comment noted.

§ 5.8.4.3 Marine and Migratory Birds, page 49 - "The *Migratory Birds Convention Act* (1994) and *Migratory Bird Regulations* (COSEWIC 2006)." Change to "the *Migratory Birds Convention Act* (1994) and the *Migratory Birds Regulations*". The *Migratory Birds Regulations* are enabled by the *Migratory Birds Convention Act*, and are not related to COSEWIC.

JEBCO – Correct, the COSEWIC reference is for the overall statement.

§ 5.8.5 Sensitive Areas, page 49 - "There are no Migratory Bird Sanctuaries located offshore Newfoundland."

Reword to "located in close proximity to the project area". There is a migratory bird sanctuary on Shepherd Island (see <http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=C47EEE0D-1>) in an area unlikely to be affected by the project.

JEBCO – this statement has been reworded, see comment above under DFO comments

§ 6.1.3 Significance Criteria, page 64 - It should be noted that the death or life-threatening injury of individuals or small groups will still violate the *Migratory Birds Convention Act* and its *Regulations*.

JEBCO – The project does not involve hunting of migratory birds, collecting eggs nor nests, or depositing a substance in water frequented by birds. Bird strikes are known to occur with aircraft, which can be detrimental to aircraft safety and persons. Mitigations are in place to avoid bird colonies.

Fish, Food and Allied Workers Union (FFAW)/Unifor

The EA indicates that exploration and production companies would not consider alternate survey methods. Yet, in the consultation for this project was only confirmed to be done by air late in the process. As this EA only considers airplane as acquisition platform, there needs to be a new consultation process if alternate platforms are considered at a later date.

JEBCO – Agreed.

The summary and conclusions suggests that "concurrent drilling, seismic surveys, well site, geohazard and VSP surveys conducted in this region for decades have not resulted in claims that significant adverse effects to biological or socio-economic VECs of the area." Harvesters have observed impact on their catch rates which may be contributed to exploration activities. Therefore, it is not an accurate description which is contained in the conclusions of the EA.

JEBCO – The statement refers to significant adverse effects as defined by the significance criteria.