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February 13, 2019

**Sent by E-mail**

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Dear Ms. Perry,

**SUBJECT: Newfoundland Orphan Basin Exploration Drilling Project – Information Requirements**

The Canadian Environmental Assessment Agency (Agency) has completed its technical review of the 2018 Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Newfoundland Orphan Basin Exploration Drilling Project. The Agency also received submissions from government experts, the public and Indigenous groups and has analyzed their comments. The Agency determined that additional information is required, as per the information requirements (IRs) attached. In addition to IRs, a list of clarifications that are required to ensure correct interpretation of project information and effects analysis is attached.

With the issuance of these IRs, the federal timeline within which the Minister of Environment and Climate Change's decision must be made is paused as of February 14, 2019. Once you have submitted responses to all IRs, the Agency will take up to 15 days to evaluate if the information provided is complete. If, at that time, the Agency determines the responses to be complete, it will commence a technical review of the additional information and the timeline for the environmental assessment will resume the following day. For further information, please consult the Agency document on Information Requests and Timelines:

<https://www.canada.ca/en/environmental-assessment-agency/news/media-room/media-room-2016/information-requests-timelines.html>.

The responses to IRs may be in a format of your choice; however, the format must be such that the

responses to individual IRs can be easily identified. You may wish to discuss certain IRs with the Agency or other government experts, as necessary, to obtain clarification or additional information, prior to submission of the responses. Working directly with government experts in this manner will help to ensure that IRs are responded to satisfactorily. The Agency can assist in arranging meetings with government experts, at your request.

The IRs and your responses will be made public on the Canadian Environmental Assessment Registry Internet site.

Please confirm receipt of this message and contact me if you require further information.

Sincerely,  
<Original Signed By>

*for/* Kathryn MacCarthy  
Project Manager – Atlantic Region  
Canadian Environmental Assessment Agency

Cc: E. Young - Canada - Newfoundland and Labrador Offshore Petroleum Board  
B. Pilgrim - Fisheries and Oceans Canada  
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C. Stevens - Major Projects Management Office  
V. Rodrigues - Parks Canada Agency  
J. Behar – Department of Indigenous Services Canada  
C. Giffin - Department of National Defence

Attachment:

Attachment 1 - Information Requirements and Required Clarifications for the Newfoundland Orphan Basin Exploration Drilling Project

## Table of Contents

INTRODUCTION.....	1
ACRONYMS AND SHORT FORMS .....	1
ATTACHMENT 1: INFORMATION REQUIREMENTS AND REQUIRED CLARIFICATIONS FOR THE NEWFOUNDLAND ORPHAN BASIN EXPLORATION DRILLING PROJECT .....	3
Information Requirements.....	3
Project Description.....	3
Alternative Means .....	4
Air Quality.....	5
Physical Environment.....	5
Fish and Fish Habitat / Marine Mammals and Sea Turtles .....	7
Migratory Birds .....	17
Species at Risk.....	23
Special Areas.....	24
Indigenous Peoples.....	27
Commercial Fisheries.....	30
Accidents and Malfunctions – Spill Scenarios .....	31
Accidents and Malfunctions – Model Inputs.....	31
Accidents and Malfunctions – Model Results.....	33
Accidents and Malfunctions - Effects .....	33
Accidents and Malfunctions – Emergency Planning and Response.....	35
Effects of the Environment on the Project.....	37
Cumulative Effects .....	38
Required Clarifications.....	41
Project Description.....	41
Physical Environment.....	41
Air Quality.....	41
Fish and Fish Habitat / Marine Mammals and Sea Turtles .....	41
Migratory Birds .....	43
Species at Risk.....	43
Indigenous Use .....	44
Commercial Fisheries.....	44
Accidents and Malfunctions .....	45
Effects of the Environment on the Project.....	45

**Newfoundland Orphan Basin Drilling Project  
Information Requirements and Required Clarifications from Environmental Impact Statement Review:  
February 13, 2019**

**INTRODUCTION**

The Canadian Environmental Assessment Agency (Agency) has completed its technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Newfoundland Orphan Basin Exploration Drilling Project. The Agency also received submissions from government experts, the public and Indigenous groups and has analyzed their comments. The Agency determined that additional information is required, as per the information requirements (IRs) below. In addition to IRs, a list of clarifications that are required to ensure correct interpretation of project information and effects analysis can be found below.

**ACRONYMS AND SHORT FORMS**

Agency	Canadian Environmental Assessment Agency
BOP	Blowout Preventer
CH <sub>4</sub>	Methane
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CO <sub>2</sub>	carbon dioxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EBSA	Ecologically and Biologically Significant Area
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
EL	Exploration Licence
FFAW	Fish, Food and Allied Workers
FSC	food, social and ceremonial
GHG	greenhouse gas
IR	information requirement
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
MFN	Miawpukek First Nation
MODU	mobile offshore drilling unit
MTI	Mi'gmawe'l Tplu'taqnn Incorporated

N <sub>2</sub> O	nitrous oxide
NAFO	Northwest Atlantic Fisheries Organization
NG	Nunatsiavut Government
NO <sub>x</sub>	nitrogen oxide
NRA	NAFO Regulatory Area
NRCan	Natural Resources Canada
PSV	Platform Supply Vessel
ROV	remotely operated vehicle
SAR	Species at Risk
SARA	Species at Risk Act
SBM	synthetic based mud
SIMA	Spill Impact Mitigation Assessment
VOC	volatile organic compound
VSP	vertical seismic profiling
WNNB	Wolastoqiyik Nation of New Brunswick

ATTACHMENT 1: INFORMATION REQUIREMENTS AND REQUIRED CLARIFICATIONS FOR THE NEWFOUNDLAND ORPHAN BASIN EXPLORATION DRILLING PROJECT

Information Requirements

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
<b>Project Description</b>				
IR-01	DFO-01; QFN	Section 1.0; Section 1.2; Section 4.2.3.4; Section 8.1.4.1; Section 9.1.4.1; Section 12.1.4.1; Section 13.1.4.1	<p>The Environmental Impact Statement (EIS) Guidelines require that spatial boundaries take into account the appropriate scale and spatial extent of potential environmental effects.</p> <p>Section 1.2 of the EIS defines the Project Area as encompassing the immediate area in which Project activities and components may occur, including direct physical disturbance to the marine benthic environment (in Exploration Licences 1145, 1146, 1148 and 1149) plus a 20 kilometre buffer (Figure 1.1). However, the Project Area does not include the transit route for vessels and helicopters to and from St. John's which are part of routine operations. No rationale is provided for the Project Area not being inclusive of all routine project activities nor is a rationale is provided for the 20 kilometre buffer from the Exploration Licences for the Project Area.</p> <p>Section 9.1.4.1 of the EIS defines the Local Assessment Area as "...the Project Area and adjacent areas where Project-related environmental effects are reasonably expected to occur based on available information, including effects thresholds, <u>predictive modelling</u>, and professional judgement." However, it is not clear how the modelling in the EIS (e.g., Appendix B – Drill Cuttings Modelling Report, Appendix C – Underwater Sound Assessment Report, and Appendix D – Oil Spill Trajectory Modelling Report) has been used to define the Local Assessment Area.</p> <p>Similarly, the Regional Assessment Area is defined as the area within which residual environmental effects from operational activities and accidental events may interact with marine and migratory birds. However, the modelling in Appendix D – Oil Spill Trajectory Modelling Report extends outside the Regional Assessment Area. It is noted that it is possible that effects from larger scale unplanned events (e.g., blowout) could extend beyond the Regional Assessment Area. It is not clear how the Regional Assessment Area encompasses potential environmental effects from operational activities and accidental events.</p>	<p>Discuss the rationale for a Project Area that is not inclusive of all Project routine activities and components.</p> <p>Provide a rationale and purpose for the buffer zone of 20 kilometre around each Exploration License.</p> <p>Provide rationale for the spatial boundaries of the Local Assessment Area and Regional Assessment Area with respect to the scale and spatial extent of potential environmental effects inclusive of accidents and malfunctions. Clarify whether the predictive modelling completed for the EIS was used to define the extent of the Local Assessment Area and Regional Assessment Area for all valued components.</p>
IR-02		Section 2.4.1	Section 2.4.1 of the EIS states that details of the safety zone would be provided to the Marine Communication and Traffic Services for broadcasting and publishing in the Notice to Shipping and Notice to Mariners. However, it is not clear whether this would be applicable to Exploration Licence 1149 which is outside the exclusive economic zone or if additional notifications or communications are required by the international community.	Discuss if any additional notifications or communications are required to notify the international community when drilling outside the exclusive economic zone at Exploration Licence 1149.
IR-03		Section 2.4.1	Section 2.4.1 of the EIS states that it will take 60 days to drill a well. No further information is provided in the EIS on the components of the timeframe, nor the factors influencing it. It is noted	Discuss the components of and the assumptions used to determine the length of time to drill a well, including the estimated drilling time based on best case or average

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			that other operators in shallower or similar water depths have predicted a longer timeframe (e.g., 80 days) to drill a well.	installations. Discuss any efficiencies that the proponent can apply that would allow a well to be drilled faster than other operators.
IR-04	CNLOPB-10, -11; KMKNO-02	Section 2.4.1; Appendix B; Appendix C	Section 2.4.1 of the EIS does not indicate whether batch drilling or simultaneous drilling may occur over the course of the Project, and if so, whether the effects analysis in the EIS is applicable. This information is required to assess the potential environmental effects of the Project.	Provide the following information on the proposed Project and associated environmental effects: <ul style="list-style-type: none"> <li>clarify if batch drilling or simultaneous drilling is being considered for this Project, and if so provide information about its frequency and duration; and</li> <li>if so, provide additional information assessing the environmental effects of batch drilling or simultaneous drilling on all valued components, including updating modelling in Appendices B and C if necessary.</li> </ul>
IR-05		Section 2.4.4; Section 2.7; Section 8.3.3.1	Section 2.4.4 of the EIS is entitled “Well Abandonment and Decommissioning,” however, no decommissioning activities are described within the section. Section 2.7 of the EIS states that wells may be designed for suspension and re-entry, however, no further information is provided on this process in the EIS. A description of all project activities is required to assess potential environmental effects.	Clarify whether the exploration wells will be abandoned rather than decommissioned.  Clarify if wells may be suspended and if so, provide further information on which circumstances wells are suspended and the methodology used to suspend an exploration well. Discuss potential environmental effects, as applicable.
IR-06	C-NLOPB-05	Section 2.5	Section 2.5 of the EIS states that when the blowout preventer (BOP) is initially installed, the remotely operated vehicle (ROV) intervention capability for operating the BOP, if necessary, will also be tested. This is done by physically engaging the ROV control panel to function the controls. However, based on the recent Husky spill in November 2018, the sea state during an accident or malfunction can be such that it is impossible to operate an ROV. The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) advises in such cases the BOP must be equipped to be operated using an acoustic signal from a platform support vessel in case of total loss of the drilling platform. The C-NLOPB advises this technology is readily available (Konsberg ASC500).	Confirm that the blowout preventer (BOP) would be equipped so that it can be operated using an acoustic signal from a platform support vessel. If it not the case, provide a rationale for not using this technology.
<b>Alternative Means</b>				
IR-07	C-NLOPB-08	Section 2.9.2.3	Section 2.9.2.3 of the EIS refers to the alternative means of drilling waste management. The C-NLOPB advised that compliance with the <i>Offshore Waste Treatment Guidelines</i> (OWTG) represents the minimum performance acceptable to the C-NLOPB. The C-NLOPB advised that various technological approaches to cuttings treatment to reduce the concentration of synthetic-on-cuttings to the lowest achievable concentration have not been considered and that where technically feasible, proponents should strive to outperform the <i>Offshore Waste Treatment Guidelines</i> targets.	Discuss approaches for cuttings treatment to reduce synthetic-on-cuttings to the lowest achievable concentration to outperform the <i>Offshore Waste Treatment Guidelines</i> targets.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
<b>Air Quality</b>				
IR-08	ECCC-01; NRCan-02; -03, -04	Section 2.8.1; Section 5.3.3	<p>The EIS Guidelines require an estimate of the direct greenhouse gas emissions associated with all phases of the Project. The EIS Guidelines also state that assumptions are clearly identified and justified.</p> <p>Section 2.8.1 of the EIS provides an estimated total value of daily and annual CO<sub>2</sub> equivalent emissions from the fuel combustion of the mobile offshore drilling unit (MODU), helicopter and platform supply vessel. Table 2.5 in Section 2.8.1 of the EIS provides an estimate of NO<sub>x</sub>, CO, SO<sub>x</sub>, and PM emissions from MODUs, platform supply vessel, etc. However, some individual Greenhouse Gas (GHG) pollutants (CH<sub>4</sub>, N<sub>2</sub>O) are not provided and combustion emission factors of total volatile organic compounds (VOCs) and other NPRI Part 1, 2, and 5 substances are not provided although they are readily available. Clarification is required with respect to the greenhouse gas emission factors and global warming potentials used to determine the final emissions.</p> <p>Similarly, an estimated total CO<sub>2</sub> equivalent emissions from flaring due to non-routine activities is provided but is not provided by individual pollutant. For a full description of possible emissions resulting from the Project, it is necessary to estimate the potential emissions if any such activities should occur.</p> <p>Section 2.8.1 of the EIS provides an estimate of the GHG emissions from flaring; however, other than “higher heating value approach”, there are insufficient details provided to assess the estimation techniques and to determine the accuracy of the estimates.</p> <p>Emission values (total suspended particulates, fine particulates smaller than 2.5 microns, respirable particulates of less than 10 microns, carbon monoxide, Sulphur oxides, nitrogen oxides, volatile organic compounds, hydrogen sulfide and other potentially toxic air pollutants) are compared to current provincial and federal emissions, but not with target values.</p>	<p>Provide assumptions and supporting evidence for emission estimates, including specific emission factors used. Provide the greenhouse gas emissions by source (MODU type, well testing, helicopters and platform supply vessel) and individual greenhouse gas pollutants (CH<sub>4</sub>, N<sub>2</sub>O). Provide an estimate of VOC emissions and other NPRI Part 1, 2 and 5 substances where emission factors are readily available. Update Table 2.5 with information requested above and with CO<sub>2</sub> equivalent per year. Provide the greenhouse gas emission factors used as well as global warming potentials used and sources for information used.</p> <p>Provide details on the assumed composition being flared, volumes being flared, and emissions factors used to obtain the final total emission rates. Estimate emissions of other pollutants (e.g., NO<sub>x</sub>, soot, CO, VOCs) from flaring or provide justification for their exclusion.</p> <p>Similar to the estimate details provided for the other emission sources (i.e., NO<sub>x</sub>, CO<sub>2</sub> and CO) from the MODU, platform supply vessel, and helicopters, provide details regarding the determination of the CO<sub>2</sub> equivalent estimate for flaring.</p> <p>Compare and assess the level of estimated emissions (total suspended particulates, fine particulates smaller than 2.5 microns, respirable particulates of less than 10 microns, carbon monoxide, sulphur oxides, nitrogen oxides, volatile organic compounds, hydrogen sulfide and other potentially toxic air pollutants) to the regional, provincial and federal emission targets.</p>
<b>Physical Environment</b>				
IR-09	KMKNO-08; NRCan-01	Section 5.1.2	<p>Figure 5.3 of the EIS provides Eastern Newfoundland seabed features information for Exploration Licence 1145. However, this does not extend to Exploration Licences 1146, 1148 and 1149. Natural Resources Canada advised that this map is from an old surficial sediment geology map that used little data in the area and was based mostly on bathymetry, and that it is not reliable for geohazard purposes. Natural Resources Canada has provided references to be reviewed on the geology and potential for geohazards in the Orphan Basin, and advised that if the proponent has collected additional geological information as part of their exploration program, this information could be used to augment the references provided by Natural Resources Canada.</p> <p>Section 5.1 of the EIS discusses Mass Transport Deposits (MTD), i.e., submarine landslides. However, the EIS does not provide a discussion of the geohazards presented by MTDs. Campbell reports (2005) that the MTDs carry coarser sand and gravel and can be unstable in areas based</p>	<p>Taking into consideration the provided references, and any additional geological information from the exploration program, discuss the surficial geology within the Exploration Licences and the potential for submarine landslides (and their runouts) to impact drilling activities within the Exploration Licences. Discuss sediment quality, thickness, grain size and mobility in the Project Area.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>on the presence of diapiric features. Natural Resources Canada requested the proponent discuss the potential for submarine landslides (and their runouts) to impact drilling activities within the Exploration Licences. Natural Resources Canada provided references to be reviewed to obtain information pertaining to sediment quality, thickness, grainsize and mobility. It is noted that C-NLOPB will require a further geohazard assessment on the Exploration Licences prior to the issuance of any approval to drill a well.</p> <p><u>References</u></p> <p>Aksu, A.E. and Hiscott, R.N. (1992). Shingled Upper Quaternary debris flow lenses on the NE Newfoundland slope. <i>Sedimentology</i>, 39, 193-206.</p> <p>Campbell, D.C., (2005). Major Quaternary mass-transport deposits in southern Orphan Basin, offshore Newfoundland and Labrador; Geological Survey of Canada, Current Research 2005-D3, 10 p.</p> <p>Hiscott, R.N. and Aksu, A.E. (1996). Quaternary sedimentary processes and budgets in Orphan Basin, southwestern Labrador Sea. <i>Quaternary. Res.</i>, 45, 160–175.</p> <p>Lia, Gang, Piper, David J.W., Campbell, D. Calvin and Mosher, David. (2012). Turbidite deposition and the development of canyons through time on an intermittently glaciated continental margin: The Bonanza Canyon system, offshore eastern Canada. <i>Marine and Petroleum Geology</i> 29, (1), 90-103.</p> <p>Piper, D.J.W., Tripsanas, E., Mosher, D.C., and MacKillop, K., 2019, Paleoseismicity of the continental margin of eastern Canada: Rare regional failures and associated turbidites in Orphan Basin: <i>Geosphere</i>, v. 15, no. 1, p. 85–107, <a href="https://doi.org/10.1130/GES02001.1">https:// doi .org /10.1130 /GES02001.1</a>.</p> <p>Tripsanas, E.K., Piper, D.J.W. and Jarret, K.A., (2007). Logs of piston cores and interpreted ultra-highresolution seismic profiles, Orphan Basin. Geological Survey of Canada, Open file 5299.</p> <p>Tripsanas, E.K., Piper, D.J.W. and Campbell, D.C. (2008). Evolution and depositional structure of earthquake-induced mass-movements and gravity flows: southwest Orphan Basin, Labrador Sea. <i>Marine and Petroleum Geology</i>. 25, 7, 645-662.</p> <p>Tripsanas, E., Piper, D.J.W., Jenner, K.A. and Bryant, W.R., (2008). Sedimentary characteristics of submarine mass-transport deposits: New perspectives from a core-based facies classification. <i>Sedimentology</i>. 55, 97–136</p>	
IR-10	NRCan-01	Section 16.1.4	<p>Section 5.1 and Section 16.1.4 of the EIS provide information on the geology and geological stability and seismicity on the Orphan Basin. However, there is no mention of the importance of elevated or excess pore pressure in slope stability. Natural Resources Canada recommended that the research by Loloi (2004) and Cameron et al (2014) be consulted to provide additional information. The Storegga slide in Norway is discussed in the EIS as an example of slope stability</p>	<p>Review the geotechnical data on slope stability from Loloi (2004) and Cameron et al (2014) related to the Orphan Basin. Discuss the probability of any re-mobilization of the slope failures and present information on the slope stability in the Orphan Basin. Discuss the importance of elevated or excess pore pressure in slope stability in the Orphan Basin.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>comparable to the Project; however, Natural Resources Canada advises that data is available for the Orphan Basin.</p> <p><u>References</u></p> <p>Cameron, G.D.M., Piper, D.J.W. and MacKillop, K., 2014, Sediment failures in northern Flemish Pass; Geological Survey of Canada, Open File 7566. 141 p. doi:10.4095/293680</p> <p>Loloi, Mehdi, (2004). Slope Instability analysis of a part of Orphan Basin off Newfoundland. Masters of Engineering Thesis, Dalhousie University, 220 p.</p>	
<b>Fish and Fish Habitat / Marine Mammals and Sea Turtles</b>				
IR-11	DFO-02; WM-22	Section 6.1	<p>Section 6.1.3 of the EIS Guidelines require a characterization of fish populations that could potentially be affected by routine project operations or by accidents and malfunctions. Section 6.1.7 of the EIS provides a high level overview of the life history of finfish in the Project Area that relies upon the Eastern Newfoundland Strategic Environmental Assessment. Table 6.4 identifies key fish species within the Regional Assessment Area and Project Area. While there is information the life history of some key species in Section 6 and Section 7, life history of all key species identified in Table 6.4 has not been provided. Fisheries and Oceans Canada advised that more recent information for fish species is available.</p> <p>Fisheries and Oceans Canada advised that species harvested in the Regional Assessment Area (RAA) (e.g., Winter Flounder, Toad Crab, Monkfish, <i>Pandalus montagui</i>) in Table 7.4 were not described in Section 6.1 of the EIS.</p>	<p>Describe the life history, with respect to survival, reproduction and growth, of fish (groundfish and pelagic), plankton and invertebrate species that may be present in the Project Area that may be affected by project routine activities and accidental events. Incorporate more recent publications, where available.</p> <p>Provide revised tables where information where Fisheries and Oceans Canada identified inconsistencies or omissions.</p> <p>In instances where fish assemblages are discussed, provide a rationale for identification of the representative species.</p> <p>Update the environmental effects analysis of routine project activities and accidental events on fish and fish habitat in the Project Area based on the revised discussion.</p>
IR-12	KMKNO-21; KMKNO-18; PNIN-08	Section 6.1	<p>Section 6.1 of the EIS states the description of the biological environment presented for the Project is based on the results of previous research and existing scientific literature and environmental assessment. Section 6.1.6 acknowledges the data gap with respect to existing benthic communities that occur on deeper continental shelf environments and in abyssal habitats. In particular, the gap in information is evident in Exploration Licence 1149.</p> <p>Section 6.1.6.1 of the EIS describes the presence of corals in Exploration Licence 1145 and 1146; however, the description of the presence of corals in Exploration Licences 1148 or 1149 is limited to Table 6.3 of the EIS which indicates that there are corals "...around Exploration Licence 1148". It is not clear whether international organizations have completed surveys in these areas. Information on the presence and distribution of coral species is required for all Exploration Licences in the designated project to understand the potential environmental effects of the project.</p> <p>In addition, Section 6.1.7 of the EIS provides several figures related to fish distribution in the Project Area and Regional Assessment Area, however the figures showing fish species distributions do not identify fish as occurring in Exploration Licence 1149. It is not clear if the absence of fish in that Exploration Licence is due to a lack of data or if there are no fish in that</p>	<p>Describe the presence and distribution of coral species in Exploration Licence 1148 and 1149. Confirm whether there have been surveys conducted in Exploration Licence 1149 (i.e. Northeast Atlantic Fisheries Organization surveys), and discuss the findings of those surveys.</p> <p>Provide a rationale for the absence of fish species in Exploration Licence 1149, as illustrated in figures found in Section 6.1.7 of the EIS, including a discussion of data used and data gaps relevant to the Figures. Alternatively provide a discussion on the fish distribution in Exploration Licence 1149.</p> <p>In the absence of biophysical data and information related to existing conditions in Exploration Licence 1149, discuss how the assessment of environmental effects of exploration drilling on the resources in this exploration was conducted.</p> <p>Update the effects predictions, and proposed mitigation and follow-up, if required.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			area. An understanding of existing conditions in all Exploration Licences is required to understand the potential environmental effects of the Project on fish and fish habitat.	
IR-13	DFO-17, - CL-44	Section 2.8; Section 5.3; Section 5.4.2; Appendix D, Figures B.1.5 and B.1.6	<p>Section 2.8 of the EIS states that the 5-year hindcast HYCOM (HYbrid Coordinate Ocean Model) current dataset was analyzed and used in the drill waste deposition modelling simulations.</p> <p>Fisheries and Oceans Canada has advised that with respect to drill waste deposition modelling, the use of a model hindcast current dataset instead of an observed current dataset may not be appropriate unless the model has been validated for representative and extreme current conditions. The extent to which the HYCOM model simulation has been validated with observational currents data is unclear.</p> <p>It is noted that this is particularly relevant as Section 5.4.2 of the EIS indicates that currents observed at one location are much stronger than indicated from the model. Fisheries and Oceans Canada has noted that displays of current speed in Figures B.1.5-B.1.6 of Appendix D to the EIS indicate that the upper-ocean currents in the HYCOM simulation may be weaker than those indicated by the moored current measurements at the Lona O-50 site in Section 5.4.2.2 of the EIS. As such, Fisheries and Oceans Canada has requested a comparison of the model currents with observed currents.</p>	<p>With respect to the drill waste deposition modelling, provide:</p> <ul style="list-style-type: none"> <li>• a rationale for the use of model hindcast current dataset as a model input to predict dispersion of disposed drill cuttings;</li> <li>• a description of how the HYCOM model simulation has been validated through the use of observational and extreme current data; and</li> <li>• a comparison of the model currents with observed currents, and discuss the effect of using each in the model.</li> </ul> <p>In addition, confirm if the model used for drill waste deposition had been validated for representative and extreme current conditions.</p>
IR-14	DFO-22	Appendix B	<p>Appendix B provides the information related to the completed drilling waste dispersion model. Fisheries and Oceans Canada has advised that information about the drilling waste dispersion modeling is incomplete with respect to the following:</p> <ul style="list-style-type: none"> <li>• the models described in the Dose-Related Risk and Effects Assessment Model (DREAM) package relate to the fate and effects of oil and other chemicals associated with liquid discharges (oil spills, produced water etc.) and mostly consider surface effects (currents and winds) rather than dispersion modelling;</li> <li>• appropriate references for the Particle Tracking (ParTrack) model are not provided;</li> <li>• the rationale for the selection of the two drilling sites was not provided;</li> <li>• clarification of if the horizontal diffusion was used in the dispersion modeling is required, and if not a rationale as to why it was not used is required;</li> <li>• details of the currents in the study area are not adequately presented. This is particularly the case for deep water currents which may affect benthic boundary layers and resuspension. Carter and Schafer (1983) provide an excellent summary of the currents across the study area and of their potential effects on sedimentation and resuspension as well as on the substrates and associated fauna. They also summarize available data on current direction and strength for the larger area which indicates that the deep water currents are also subject to intermittent reversal of direction (Carter and Schafer, 1983). Since the summary figures of the currents used to parameterize the model are not provided it is difficult to determine if these features are adequately represented by the model;</li> <li>• the rationale for using the top 100 metres of current records to select the low and high current periods is not provided. This depth may be relevant for initial release of SBM cuttings</li> </ul>	<p>With respect to the drilling waste dispersion model provide the following:</p> <ul style="list-style-type: none"> <li>• a discussion on the extent to which the model simulation is representative of the various current components in the Orphan Basin;</li> <li>• appropriate references for ParTrack model;</li> <li>• a rationale for selection of the two drilling sites;</li> <li>• clarification on whether the horizontal diffusion was used in the dispersion modelling, and if it was not used a rationale as to why it was not used;</li> <li>• a detailed description of currents in the study area in particular deep water currents and how they may affect benthic boundary layers and resuspension, taking into consideration Carter and Schafer (1983);</li> <li>• a rationale for using the top 100 metres of current records to select the low and high current periods in the modelling;</li> <li>• the time step for the current inputs regarding the models use 5 years of HYCOM data (2006-2010) in depth bins of 100 metres (40 bins over 5000 metres), and</li> <li>• a description of how salinity and temperature information were used in the modelling and how these reconciled with the HYCOM data bins.</li> </ul>

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			<p>(at 15 metres) but does not capture current behavior for the WBM releases (near bottom) or the later fate of SBM particles.</p> <ul style="list-style-type: none"> <li>the time step for the current inputs was not specified in the 5 years of HYCOM data (2006-2010) in depth bins of 100 metres (40 bins over 5 000 metres) in the model; and</li> <li>salinity and temperature needed for water mass density calculations are extracted from the World Ocean Atlas on a monthly basis. It is not clear if this means that one value per depth bin is used for the entire modelled period. Information to address each of the points raised by Fisheries and Oceans Canada is necessary to evaluate the validity of the predicted potential environmental effects.</li> </ul> <p><u>Reference</u></p> <p>Carter, L. and Schafer, C.T, 1983. Interaction of the Western Boundary Undercurrent with the continental margin off Newfoundland. <i>Sedimentology</i>, 30, pp. 751-768.</p>	
IR-15	DFO-23	Appendix B	<p>Figure 5.4 in Appendix B of the EIS illustrates the particle size distributions for barite, bentonite and drill cuttings used in the drilling mud and cutting dispersion modelling. However, the use of these in the model is not described in the Appendix or EIS.</p> <p>Fisheries and Oceans Canada has advised that only the largest particles settle out during the modelled period, because fine particles make up the majority of particles, the majority of the drilling wastes are predicted to remain in the water column and advect elsewhere. Appendix B states that approximately 50 percent of the waste material would be transported outside the boundaries of the modelling domain and because it is dispersed would only eventually settle to thicknesses of one µm or less and therefore would not have any significant effects. Fisheries and Oceans Canada stated that the estimate of 50 percent is not supported by either the data provided in Figure 5.4 or the model descriptions (Rye et al. 1998, 2006) and that a figure of close to 75 percent may be more appropriate.</p> <p>Also, the fate and potential effect of these particulate wastes outside the study boundary is not considered in the assessment.</p>	<p>With respect to the drill mud and cuttings dispersion modelling, provide the following:</p> <ul style="list-style-type: none"> <li>a description of the use of particle size distributions for barite, bentonite and drill cuttings in the model;</li> <li>supporting evidence showing around 50 percent of waste material that would be transported outside the model domain, or an updated description of the predicted percent of waste material to be transported outside the boundary of the modelling domain; and</li> <li>a discussion of the fate and potential effects of particulate waste outside of the study boundary.</li> </ul>
IR-16	KMKNO-20; WNNB-01, -02; MTI-01, -04	Section 6.1.4.4; Section 6.1.9; Section 8.3.3.1	<p>Several Indigenous groups have expressed concerns about potential effects of the project on Salmon.</p> <p>Comments from the MTI state that Atlantic salmon are known to exhibit avoidance behaviours to light exposure, infrasound, and surface disturbance. In addition, light and sound stimuli can influence swimming depth and speed. MTI further noted that salmon are sensitive to acoustic particle motion at frequencies below 200 Hz. Infrasound disturbance has short-term effects on fish behaviours and typically return to pre-stimulus states. This may cause flight behaviour to lessen over time to all stimuli, so repeated/extensive exposure can lead to habituation (Bui et al,</p>	<p>Update the analysis of effects on Atlantic Salmon from routine project activities:</p> <ul style="list-style-type: none"> <li>considering references and WNNB's concerns, provide a rationale for the conclusion that salmon that return to New Brunswick waters are not found in the Project Area;</li> <li>the biological and behavioural responses of Atlantic salmon to light and noise; and</li> <li>any proponent participation in industry supported research to improve the knowledge of smolt and salmon migrations.</li> </ul> <p>Update the effects predictions, and proposed mitigation and follow-up, if required.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>2013)<sup>1</sup>. The EIS provides little analyses on the behavioural response effects to migrating salmon due to light and sound effects of the Project.</p> <p>The KMKNO has suggested that since smolt and adult salmon migrations cross the potential vessel route, information should be enhanced through industry supported research opportunities and initiatives.</p> <p>Section 6.1.9 of the EIS provides information on salmon designated units and the presence in the Project Area. WNNB stated that the conclusions with respect to the sub-populations that utilize New Brunswick and area waters are made despite the findings of Reddin and Frieland (1993), Lacroix (2013) and Soto et al. (2018), which suggest the salmon, at various life stages may utilize the Project Area for feeding.</p> <p><u>References:</u></p> <p>Lacroix, G.L. 2013. Population-specific ranges of oceanic migration for Atlantic salmon (<i>Salmo salar</i>) documented using pop-up satellite archival tags. <i>Can. J. Fish. Aquatic. Sci.</i>, 70:1011-1030.</p> <p>Reddin, D.G. and K.D. Frieland. 1993. Marine environmental factors influencing the movement and survival of Atlantic salmon. International Council for the Exploration of the Sea. Report: C.M 1993/M:42/ Ref. C+H Anadromous and Catadromous Fish Committee</p> <p>Soto, D.X., C.N. Trueman, K.M. Samways, M.J. Dadswell, and R.A Cunjak. 2018. Ocean warming cannot explain synchronous declines in North American Atlantic salmon populations. <i>Marine Ecology Progress Series</i>. doi: 10.3354/meps12674.</p>	
IR-17	DFO-19; DFO-CL-36, CL-37; KMKNO-16	Section 6.1.7, Table 6.4	<p>Table 6.4 in Section 6.1.7 of the EIS classifies the potential for occurrence of key fish species in the Regional Assessment Area and Project Area. However, no methodology or definition was provided to clarify the basis of the potential for occurrence. This is required to avoid misinterpretation (i.e., does occurrence mean presence or abundance).</p> <p>In addition, it was noted by Fisheries and Oceans Canada that the fish distribution analysis was based on Fisheries and Oceans Research Vessel data from 2015/2016, and that there are several other sources of information that should have been considered, for example all data collected using Campelean trawl (1995-present) since 2015-2016. This is important as 2015/2016 could potentially be an anomalous year for one or more species</p> <p>Further, with respect to corals and sponges it was noted by Fisheries and Oceans Canada that the research vessel surveys extend only to the extreme east of the study area and include limited sets in the eastern most Exploration Licences, and that it would have been appropriate to use</p>	<p>With respect to the analysis of fish distribution:</p> <ul style="list-style-type: none"> <li>consider data in the sources provided by Fisheries and Oceans Canada, in particular with respect to surveys conducted outside the Economic Exclusion Zone and update Table 6.4 and Figures 6.6-6.11; and</li> <li>provide the definition or methodology used to determine potential for occurrence.</li> </ul> <p>Update the effects assessment, and proposed mitigation and follow-up, if required.</p>

<sup>1</sup> Bui, S., Oppedal, F., Korsøen, Ø. J., Sonny, D., & Dempster, T. (2013). Group behavioural responses of Atlantic Salmon (*Salmo salar* L.) to light, infrasound and sound stimuli. *PLoS one*, 8(5), e63696.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>several years of survey data (e.g. Gullage et al. 2016). As such, the limitations of using the data requires discussion.</p> <p>In addition, Fisheries and Oceans Canada has advised that information from Spanish, Portuguese, and European Union (EU) Research Vessel Surveys conducted outside of the 200 mile Canadian Economic Exclusion Zone (EEZ) in Northwest Atlantic Fisheries Organization (NAFO) Subdivisions 3L and 3M have not been included, and are readily available from the NAFO Secretariat website (<a href="https://www.nafo.int/Publications/General">https://www.nafo.int/Publications/General</a>). There was a Canadian Research Vessel Survey conducted on the Flemish Cap from 1978-1985, this was subsequently replaced by an EU-Flemish Cap survey which has occurred annually since 1988. In 2003 the European Union survey was extended to the Flemish Pass in Division 3L. The European Union Surveys include the following: European Union in Division 3M (1988-2017), EU-Spain in Div. 3NO (1995-2017) and European Union-Spain in Division 3L (2003-2017).</p>	
IR-18	KMKNO-23	Section 6.1.6.1; Section 8.3.3.1; Section 11.3.3.1	<p>In reference to sensitive benthic habitat-forming species, corals, sponges and sea pens are present in the West Orphan Basin, in particular in Exploration Licence 1145 and 1148. Section 8.3.3.1 of the EIS states as a result of the accumulation of drill solids on the seafloor, it is possible that some species may die from the mass of the discharges crushing them, while others may die because they cannot penetrate through the deposited layer that is burying them.</p> <p>Section 8.3.3.1 of the EIS states sediment thickness of 6.5mm could extend 128m from the discharge point and could cover an area up to 0.69 hectares per well; coral and sponges within this localized area may be affected by the deposition of drilling waste.</p> <p>The EIS does not discuss the potential for deposited drilling waste discharges to result in permanent habitat change (i.e. hard substrate from concrete discharges where soft substrate may have been previously present or soft substrate from drill cuttings where hard substrate may have been previously present). This potential change in habitat could potentially inhibit the populations from repopulating the area around the wellhead for the area to which cuttings disperse.</p> <p>Section 8.3.3.1 of the EIS concludes that benthic mortality rates as a result of these discharges are not predicted to result in irreversible changes to local populations, although it is acknowledged that there are fewer data on effects of drilling waste on corals and sponges, and recovery rates for these communities are expected to be longer. No further information is presented on how the habitat changes could be reversed.</p>	<p>Given the location of the Exploration Licences included in the Project, and noting the special areas, describe the mechanisms by which the changes in habitat for corals and sponges could be reversible around a wellsite after drilling cuttings have settled.</p> <p>Discuss the potential for permanent habitat loss for corals and sponges in the Project Area.</p>
IR-19	KMKNO-24	Section 8.3.3.2	<p>Section 8.3.3.2 of the EIS states drilling activities and the dynamic positioning activity of the mobile offshore drilling unit may affect the quality of the underwater acoustic environment for marine fish. The potential environmental effects of underwater sound from project activities on marine fish is discussed however, there is no discussion of effects on sedentary or invertebrate or fish species with low motility.</p> <p>KMKNO identified references that should be considered in an updated effects analysis.</p>	<p>Discuss the potential adverse environmental effects of underwater sound from project activities to sessile/sedentary epifauna and slower moving lower motility invertebrate and fish species.</p> <p>Update the effects predictions, and proposed mitigation measures and follow-up, if required.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p><u>References</u></p> <p>Edmonds, N.J., Firnin, C.J., Goldsmith, D., Faulkner, R.C., and Wood, T. 2016. A review of crustacean sensitivity to high amplitude underwater noise: Data needs for effective risk assessment in relation to UK commercial species. <i>Marine Pollution Bulletin</i>, 108(1-2): 5-11. ISSN 0025-326X, doi.org/10.1016/j.marpolbul.2016.05.006.</p> <p>Griffiths, J.R., Kadin, M., Nascimento, F.J., Tamelander, T., Törnroos, A., Bonaglia, S., Bonsdorff, E., Brüchert, V., Gårdmark, A., and M. Jämström. 2017. The importance of benthic-pelagic coupling for marine ecosystem functioning in a changing world. <i>Global Change Biology</i> 23: 2179-2196. Doi: 10.1111/gcb.13642.</p> <p>Hawkins, A.D., Pembroke, A.E., and Popper, A.N. 2014. Information gaps in understanding the effects of noise on fishes and invertebrates. <i>Rev. Fish Biol. Fish.</i> 25, 39e64. Doi:10.1007/s11160-014-9369-3.</p> <p>Popper, A.N., and Hawkins, A.D. 2018. The importance of particle motion to fishes and invertebrates. <i>The Journal of the Acoustical Society of America</i>. 143:470. doi: 10.1121/1.5021594.</p> <p>Roberts, L., Cheeseman, S., Elliott, M., and Breithaupt, T. 2016. Sensitivity of <i>Pagurus bernhardus</i> (L.) to substrate-borne vibration and anthropogenic noise. <i>Journal of Experimental Marine Biology and Ecology</i>, 474: 185-194. ISSN 0022-0981, doi.org/10.1016/j.jembe.2015.09.014.</p>	
IR-20		Section 8.1.3	<p>Sections 8.1.3, 9.1.3 and 10.1.3 of the EIS state that the assessment of Project-related effects on marine fish and fish habitat, birds and marine mammals and sea turtles focused on the potential change in risk of mortality or physical injury, and potential change in habitat use or quality.</p> <p>Section 4.3 of the EIS Guidelines states that in describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach. While fish mortality or injury and potential changes in habitat quality are components, the environmental effects analysis did not consider other ecosystem components such as changes in abundance, community structure, or changes in food availability or quantity. The environmental effects of the Project on defined valued components requires an analysis of ecosystem components such as abundance, community structure, and changes in food availability or quantity.</p>	<p>Provide the rationale for the selection of a change in risk of mortality or injury and potential change in habitat use or quality as the basis of the effects analysis and how this is consistent with the ecosystem approach to environmental assessment required described in the Agency's EIS guidelines.</p> <p>Discuss the applicability of other project-related effects and pathways and why they were excluded, from the effects assessments Where gaps in the analysis are identified e.g. potential for changes in food availability and quantity for marine fish and fish habitats, migratory birds, and marine mammals and sea turtles, update the analysis.</p>
IR-21	DFO-12	Section 15.5; Section 15.5.1.3	Section 15.5 of the EIS states that a spill of synthetic-based mud may occur from the mobile offshore drilling unit or the marine riser during the project. Potential effects of a synthetic-based mud spill are discussed in Section 15.5.1.3 of the EIS, which states that change in risk of mortality or physical injury following a spill of synthetic-based mud would likely be restricted to	Taking into consideration the results of synthetic based muds spill modelling, discuss the potential set back distances of well sites planned to protect benthic habitat from a potential spill of synthetic based mud.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>smothering effects on immotile individual and benthic prey species within up to approximately one kilometre from the spill site.</p> <p>The EIS does not discuss mitigation measures for slow-growing and long-lived species of large benthic organisms, such as sponges and corals with respect to the potential for smothering following a spill of synthetic-based mud. Fisheries and Oceans Canada has advised that adverse effects, such as smothering, can be mitigated or avoided with appropriate set-back distance from sensitive benthic species.</p>	
IR-22	KMKNO-25	Section 2.10; Section 8.3.3; Section 8.5	<p>Sections 2.10, 8.3.3.2 and 8.5 of the EIS provide information on the imagery-based seabed surveys that will be conducted during the project. While the proponent states that there will be pre-drill imagery-based seabed survey, the KMKNO noted that the commitment to conduct a post- drill imagery-based survey is unclear, based on the following:</p> <ul style="list-style-type: none"> <li>• Section 2.10 states “A seabed survey will be conducted at the end of the drilling program using an ROV to survey the seabed for debris.”;</li> <li>• Section 8.5 states that “BP plans to conduct a visual survey of the seafloor using an ROV after drilling activities to assess the visual extent of sediment dispersion and validate drill waste modelling predictions.”; and</li> <li>• Section 8.3.3.2 states that “BP will conduct an imagery-based seabed survey at the proposed wellsite(s) to confirm the absence of shipwrecks, debris on the seafloor, unexploded ordnance, and sensitive environmental features, such as habitat-forming corals or species at risk... This survey will also serve to provide baseline data for coral and sensitive benthic habitat that may be present and be used to inform discussions on potential follow-up and monitoring with respect to drill waste discharges.”</li> </ul> <p>Clarification is required related to post-drilling follow up and monitoring proposed in the EIS.</p>	<p>Provide clarification as the follow-up and monitoring to be conducted post-drilling, including:</p> <ul style="list-style-type: none"> <li>• clarify whether the imagery-based survey proposed at the end of the drilling program for debris is the same survey that will be used to assess the extent of sediment dispersion;</li> <li>• confirm whether the visual survey of the seafloor using a remotely operated vehicle to assess the extent of sediment dispersion will be completed for each wellsite drilled; and</li> <li>• describe how the extent of sediment dispersion will be measured and how modelling predictions will be validated.</li> </ul>
IR-23		Section 10.3.3.2	<p>The Local Area Assessment is defined in the EIS as the Project Area and adjacent areas where Project-related environmental effects are reasonably expected to occur based on available information, including effects thresholds, predictive modelling, and professional judgement. The Local Assessment Area for marine mammals and sea turtles is defined as a 150 kilometre radius around the Exploration Licences as well as the associated vessel and aircraft routes to the Project Area. Figure 10.1 however, shows the 150 kilometre radius buffer to be from the Exploration Licences only. Section 10.3.3.2 of the EIS indicates that sound modelling for the Project shows that behavioural effects could occur for marine mammals up to approximately 47 to 61 kilometres from the MODU, therefore the rationale for application of 150 kilometre radius is not clear.</p>	<p>Explain the rationale for applying a 150 kilometre buffer in defining the Local Assessment Area for marine mammals and sea turtles and clarify whether the buffer is only around the Exploration Licences (or also supply vessel and aircraft routes).</p>
IR-24		Section 6.3.2; Section 6.3.3; Section 6.3.4;	<p>Section 6.3 of the EIS provides baseline information on marine mammals and sea turtles, including species at risk, but does not discuss key habitats or movement corridors within the</p>	<p>Provide information on key habitats or movement corridors for marine mammals and sea turtles found in the Project Area, as well as on the times of year that they are</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
		Section 6.3.5; Section 6.3.7	<p>Project Area. The EIS does not discuss why marine mammal and sea turtle species are using the Project Area and what times of year it is used.</p> <p>Section 6.3.8 of the EIS states that “based on the Fisheries and Oceans Canada sightings database, the southern portion of the Project Area appears to host a more concentrated proportion of the marine mammals recorded within the Project Area”; however, the EIS does not consider if this is due to habitat or sample bias.</p>	<p>present. Discuss the reasons why these marine mammal and sea turtle species are found in the Project Area (e.g., feeding, migration).</p> <p>Discuss why the sightings data that is included in the EIS shows that the southern portion of the Project Area hosts a higher concentration of marine mammals than other areas, including whether there is a sample bias in the data.</p> <p>Update the effects analysis, if required.</p>
IR-25	BALAENA-01; DFO-03	Section 6.3.2	<p>The Balaena Institute identified the slope of the Orphan Basin and the Sackville Spur as important areas for cetaceans that appear to have significantly important marine biodiversity. It also stated that these areas are located outside Canada's exclusive economic zone and thus have historically not been included in federal science surveys and reports. Although Northern Bottlenose whales are listed as “uncommon” in Table 6.16 of the EIS, Northern Bottlenose whales have been documented in the Project Area. The Balaena Institute indicated that the Orphan Basin and the Sackville Spur represents important habitat for the species recovery and connectivity between Canadian populations of Bottlenose Whales on the Scotian Shelf and northern Labrador Davis Strait. The Balaena Institute advised that it has recent unpublished studies that would provide additional independent information on the density and distribution of cetaceans in the area.</p> <p>With respect to the overview of marine mammal and sea turtle occurrence presented in Section 6.3.2 of the EIS, Fisheries and Oceans Canada advised that in addition to the sightings database (1947-2015) that was used to provide information on species occurrence in the Regional Assessment and Project Areas, there are other sightings databases that can be found in the Ocean Biogeographic Information System (OBIS).</p>	<p>Taking into consideration information available from the Balaena Institute in the Regional Assessment and Project Areas, and other sightings databases that can be found in the Ocean Biogeographic Information System (OBIS), update the effects analysis and proposed mitigation measures and follow-up program, including significance predictions, as applicable.</p>
IR-26	DFO-08; DFO-CL-19; KMKNO 34	Section 10.3.3.1	<p>Section 10.3.3.1 of the EIS provides information on the potential effects of sound on marine mammals. Tables 11 and 12 from Matthews et al., 2017 are referenced in Section 10.3.3.1 of the EIS. However, Fisheries and Oceans Canada noted that there are no sound pressure level (SPL) peak threshold values identified in Tables 11 and 12 for non-impulsive sound (i.e., from a drilling platform). The columns in Tables 11 and 12 for peak threshold for injury for a drilling platform are listed as “n/a”. However, Table 10.4 in the EIS provides the acoustic threshold levels for permanent threshold shift onset for dB SPL peak levels for non-impulsive sounds. Fisheries and Oceans Canada indicated that there are no peak SPL threshold levels provided for non-impulsive sounds in National Oceanic and Atmospheric Administration’s marine mammals acoustic technical guidance so it is not clear where values in Table 10.4 of the EIS were derived from.</p> <p>In addition, it is not clear what the radius of 200 metres in the following statement is based on: “Similarly, modelling results indicate that most marine mammals would have to occur and remain within approximately 200 m of the MODU for a 24-hour period to experience sound levels above the thresholds associated with PTS based on the SELcum injury (see Tables 11 and 12 in Matthews et al. 2017).” The maximum radius for injury after 24 hours is shown in Tables 11</p>	<p>Provide the reference for sound pressure level peak threshold for non-impulsive sounds.</p> <p>Clarify the maximum radius from the MODU that injury could occur in marine mammals after 24 hour exposure to sound from the MODU.</p> <p>Update the effects assessment, as applicable.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			and 12 as being 3.29 kilometres for high-frequency cetaceans and 230 metres for low-frequency cetaceans.	
IR-27		Section 14.4.1	<p>Section 14.4.1 of the EIS states that the Project Area does not overlap with special areas known to be of particular importance to marine mammals; however, the Orphan Spur Ecologically or Biologically Significant Marine Area overlaps with the Project Area and the Fisheries and Oceans Canada report noted below provides information on high concentrations of marine mammals in the Project Area.</p> <p><u>Reference</u></p> <p>Fisheries and Oceans Canada. 2017. Identification and Descriptions of Ecologically and Biologically Significant Areas in the Newfoundland and Labrador Shelves Bioregion. Canadian Science Advisory Secretariat, Research Document 2017/013.</p>	Confirm the overlap of the Project Area with the Orphan Spur Ecologically or Biologically Significant Marine Area. Discuss why the Orphan Spur was designated as an Ecologically or Biologically Significant Area, taking into consideration the importance of the area to marine mammals. Update the effects analysis, as necessary.
IR-28	MTI 12; KMKNO-33; WM- 63	Section 10.3.2; Section 10.3.3.1; Section 10.3.3.2; Section 13.3.2; Section 14.4.4	<p>Section 10.3.2 of the EIS states that during transit to/from the Project Area, platform supply vessels will travel at vessel speeds not exceeding 22 kilometres per hour (12 knots), except as needed in the case of an emergency. In the event that a marine mammal or sea turtle is detected in proximity to the vessel, vessel speed will be reduced to avoid the marine mammal or sea turtle. The KMKNO has requested that vessels be required to reduce speeds to 10 knots when a marine mammal or sea turtle is observed or reported in the vicinity.</p> <p>Section 10.3.3.1 of the EIS states that “vessel crew will keep watch for marine mammals and sea turtles and reduce speed and/or alter course as appropriate to avoid collision.” It is not clear however, whether there would be dedicated marine mammal observers on supply vessels or whether observations would be conducted opportunistically by vessel crew.</p> <p>Section 10.3.3.1 of the EIS states that the International Whaling Commission advocates for reducing the spatial overlap between high numbers of whales and vessels as the best means to mitigate ship strikes, with vessel speed restrictions as an alternate strategy in areas where spatial separation is not possible. However, the EIS does not indicate whether the proponent intends to implement the mitigation suggested by the International Whaling Commission.</p>	<p>Provide additional information on mitigation measures that would be implemented related to supply vessels to avoid ship strikes including:</p> <ul style="list-style-type: none"> <li>the distance from the supply vessel that a marine mammal or sea turtle would need to be for vessel speed to be reduced;</li> <li>under what circumstances it may not be possible to travel at the defined safe vessel speed;</li> <li>whether dedicated marine mammal observers would be employed on supply vessels or whether vessel crew would be trained to monitor for marine mammals and sea turtles. If it is proposed that vessel crew monitor for marine mammals, describe the training that they would receive and procedures that they would follow (such as opportunistic versus systematic observations, dedicated monitoring times, etc.); and</li> <li>whether there would be marine mammal observers on all supply vessels.</li> </ul> <p>Clarify whether the proponent intends to reduce the spatial overlap between high numbers of whales and vessels and, if so, whether any systematic monitoring would take place to determine if high numbers of whales are congregating along platform supply vessel routes. If applicable, define what “high numbers” of whales is considered to be.</p>
IR-29		Section 10.3.2	<p>Section 10.3.2 of the EIS states that platform supply vessels will use existing shipping lanes as practicable, and where these do not exist, platform supply vessels will follow a straight-line approach to the Project Area.</p> <p>Given the location of the Exploration Licences included in the Project and species in the area, consider whether any areas could require avoidance/route alteration by platform supply vessels</p>	Describe the shipping lanes that exist between the supply base (i.e., St. John’s, Bay Bulls or alternative site if under consideration) and the Project Area. Describe whether there would be any circumstances under which a straight-line approach would be altered given potential for effects on marine mammals.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			based on potential effects on marine mammals (e.g., breeding grounds, feeding groups, migration routes).	
IR-30		Section 10.3.2	Section 10.3.2 of the EIS states that shut down procedures (i.e., shut down of source array) will be implemented if a marine mammal or sea turtle listed on Schedule 1 of SARA is observed within 500 metres of the air gun array. However, it is not clear whether shutdown would occur if any marine mammal or sea turtle species were present or how an observer would be able to distinguish between species taking into consideration distance and visibility in the marine environment.	Explain how Schedule 1 SARA species would be identified and distinguished from other species prior to and during vertical seismic profiling. Clarify whether the vertical seismic profiling source array would be shut down as a precaution if there is a question as to the species observed (i.e., whether it is a SARA-listed species).
IR-31	KMKNO-34	Section 10.3.3.3	Section 10.3.3.3 of the EIS provides potential distances modelled for various project activities within which environmental effects could occur to marine mammals and sea turtles (e.g., most marine mammals would have to occur and remain within approximately 200 metres of the MODU for a 24-hour period to experience sound levels above the thresholds associated with injury). A follow-up program was not proposed to verify the modelled predictions by monitoring the extent of sound from the project activities.	Provide a rationale for not proposing a follow-up program to verify sound predictions taking into consideration uncertainty with respect to extent of sound from project activities and potential effects of underwater sound on marine mammals.
IR-32	DFO-16; DFO-18; DFO-21; WNNB-05; PNIN-06; KMKNO-15	Section 2.10.3; Section 6.1.6; Section 8.3.2; Section 8.3.3.1	<p>Section 8.3.2 the EIS states that an imagery-based seabed survey at proposed well sites will be conducted to confirm the absence of shipwrecks, debris, unexploded ordnance, and sensitive environmental features such as habitat forming coral or species at risk. The Canada Newfoundland &amp; Labrador Offshore Petroleum Board would then be notified to discuss an appropriate course of action if environmental or anthropogenic sensitivities are detected, including potentially moving the wellsite “if it is feasible to do so”. No further information is provided.</p> <p>From the perspective of planned drilling activities and wellsite locations, the following is not clear:</p> <ul style="list-style-type: none"> <li>• what criteria would be considered to determine the feasibility of wellsite relocation to avoid or minimize impact on corals, sponges, and sensitive areas;</li> <li>• what criteria would be considered to determine relevant and feasible mitigations to avoid and reduce effects on sensitive benthic species and habitat in the event that a wellsite cannot be moved (Fisheries and Oceans Canada advised that the most effective mitigation is avoidance and/or relocation);</li> <li>• what species of habitat forming corals and sponges would be used to determine the necessity of setback from sensitive benthic species (i.e. corals, sea pens, sponges); and</li> <li>• whether the density of corals and sponges would also be considered in determining the need for setback.</li> </ul> <p>It is unclear if additional mitigation measures would be proposed if a wellsite is proposed within the Northeast Newfoundland Slope Closure marine refuge or other special areas.</p>	<p>Provide additional information with respect to the detection of environmental or anthropogenic sensitive areas during the pre-drilling imagery-based survey, discussing the following:</p> <ul style="list-style-type: none"> <li>• the criteria used to determine the feasibility of wellsite relocation to avoid or minimize impact on corals, sponges, and sensitive areas;</li> <li>• the species of habitat forming coral and sponges and sensitive habitats that would be used to determine if a wellsite should be relocated;</li> <li>• whether density of corals and sponges would also be considered in determining the need for wellsite relocation;</li> <li>• if the information gathered through the imagery-based seabed survey would be made available to the public;</li> <li>• the potential mitigation measures that would be implemented if wellsite relocation is not possible if sensitive species or habitats were identified in the imagery-based survey.</li> </ul> <p>Discuss if any additional mitigation measures would be proposed and implemented if operating in the Northeast Newfoundland Slope Closure marine refuge or other special areas.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			Several Indigenous groups and a member of the public requested that the imagery-based seabed survey be made available to the public.	
IR-33	DFO-15; C-NLOPB-13	Section 2.2, Table 2.23	<p>Section 6.1.3 of the EIS Guidelines requires a description of corals and sponges that could potentially be affected by routine project operations or by accidents and malfunctions. Section 2.2 of the EIS states that the proponent has committed to “..conduct an imagery-based seabed survey at the proposed wellsite(s) to ground-truth the findings of the Geohazard Baseline Review. This includes confirming the absence of ... sensitive environmental features, such as habitat-forming corals or species at risk. The survey will be carried out prior to drilling and will encompass an area within a 500-m radius from the wellsite.”</p> <p>Section 2.8.2 of the EIS states that “..the areal coverages for cuttings thicknesses &gt;1 millimetre (“visible” thickness threshold) ...extended up to 577 and 635 metres away from the West Orphan Basin wellsite, respectively.”</p> <p>It is not clear why 500 metres was selected as the extent to for the proposed imagery-based seabed survey prior to drilling, rather than a more conservation distance based on the predictions of the completed cutting dispersion modelling.</p> <p>The EIS does not discuss the inclusion of the location of moorings and chains in the area included in the imagery-based survey.</p> <p>While there are details included in the EIS regarding the equipment and the function of the imagery-based survey to be conducted prior to drilling, the EIS does not clearly indicate the timeline associated with conducting the pre-drill survey.</p>	<p>Provide the rationale for the selection of a 500 metre radius for the proposed imagery-based survey, including its relevance to potential effects from cuttings dispersion, versus a more conservative radius based on completed cuttings deposition modelling. Discuss the relationship between the analysis of the drill waste deposition modelling results and the parameters of the imagery-based survey mitigation measure.</p> <p>Confirm that the potential location of the moorings and chains would be included in the imagery-based survey.</p> <p>Describe the timing of the seabed investigation prior to drilling.</p>
<b>Migratory Birds</b>				
IR-34	WM-15, -17, -58, -64	Section 2.9.2.5	<p>The EIS does not provide baseline information on ambient light in the Project Area. In order to evaluate the effects of lighting from the Project, a discussion of ambient light is required.</p> <p>Section 2.9.2.5 of the EIS states that “spectral modified lighting has been tested on offshore platforms and has demonstrated a reduced effect on marine birds”; and the proponent “... has not yet made any direct inquiries with vendors regarding the availability of spectral modified lights for use in association with the Project.”</p> <p>However, Table 2.20 states that spectral modified lighting is not technically or economically feasible. However, no justification is provided as to the methodology used to determine the technical and economic feasibility of spectral modified lighting.</p> <p>Table 2.20 also states that spectral modified lighting has limited capabilities in extreme weather, and there are safety concerns with helicopter approach and landing. However, there has been no consideration of using a hybrid of both spectral modified light and standard MODU lighting (e.g., using standard lighting when helicopters are approaching).</p>	<p>Discuss existing ambient light conditions (baseline) in the Project Area and update the effects assessment taking into consideration changes in lighting that would be associated with project activities.</p> <p>Discuss the availability of spectral modified lighting for use during the Project or explain why spectral modified lighting (or a hybrid approach) is not considered to be technically and/or economically feasible.</p> <p>Explain whether the MODU under consideration for the Project would have the flexibility to change lights should spectral modified lighting become available and technically and economically feasible over the lifetime of the Project.</p>

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			<p>A submission from the public commented that modified green spectral lighting has been found to reduce the attraction of seabirds to platforms at night and has been used successfully off the Dutch coast (See Poot et al. (2008); Marquenie et al. (2014); Rodríguez et al. (2017)).</p> <p><u>References</u></p> <p>Poot, H., Ens, B.J., de Vries, H., Donners, M.A.H., Wernand, M.R. &amp; Marquenie, J.M. (2008). Green light for nocturnally migrating birds. <i>Ecology and Society</i>, 13, 1-14.</p> <p>Marquenie, J.M., Wagner, J., Stephenson, M.T., &amp; Lucas, L. 2014. Green lighting the way: Managing impacts from Offshore Platform lighting on migratory birds. Presentation at the Society of Petroleum Engineers International Conference on Health, Safety and the Environment, Long Beach, California, USA, March 17-19, 2014.</p> <p>Rodríguez, A., Dann, P., &amp; Chiaradia, A. (2017a). Reducing light-induced mortality of seabirds: High pressure sodium lights decrease the fatal attraction of shearwaters. <i>Journal for Nature Conservation</i>, 39, 68-72.</p>	
IR-35	ECCC-05	Section 6.2.1	<p>Section 6.2.1 of the EIS references the Programme intégré de recherches sur les oiseaux pélagiques, the Eastern Canadian Seabirds at Sea database, and Fifield et al. (2009).</p> <p>Environment and Climate Change Canada has noted that there are a number of additional recent scientific studies of tracking data that reveal the Northwest Atlantic (including the Project Area) as an important area for breeding and over-wintering birds regionally, nationally, and internationally, particularly murre and Dovekies. These references include but are not limited to Fort et al. 2013, Frederiksen et al. 2016, Hedd et al. 2011, Hedd et al. 2018 and McFarlane Tranquilla et al. 2013.</p> <p>Inclusion of these references would provide a more complete account of the Northwest Atlantic area and inform the effects assessment.</p> <p><u>References</u></p> <p>Fort, J., Moe, B., Strom, H., Grémillet, D., Welcker, J., Schultner, J., Jerstad, K., Johansen, K.L., Phillips, R.A., and Mosbech, A. (2013). Multicolony tracking reveals potential threats to little auks wintering in the North Atlantic from marine pollution and shrinking sea ice cover. <i>Diversity Distributions</i>. 19: 1322-1332.</p> <p>Frederiksen, M., Descamps, S., Erikstad, K.E., Gaston, A.J., Gilchrist, H.G., Grémillet, D., Johansen, K.L., Kolbeinsson, Y., Linnebjerg, J.F., Mallory, M.L., McFarlane Tranquilla, L.A., Merkel, F.R., Montevecchi, W.A., Mosbech, A., Reiertsen, T.K., Robertson, G.J., Steen, H., Strom, H., and Thorarinsson, T.L. (2016). Migration and wintering of a declining seabird, the thick-billed murre <i>Uria lomvia</i>, on an ocean basin scale: Conservation Implications. <i>Biological Conservation</i>. 200: 26-35.</p>	<p>Update information on migratory birds in the Project Area taking into consideration references provided by Environment and Climate Change Canada.</p> <p>Update the effects predictions, potential mitigation and follow-up, as well as significance predictions, as applicable.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>Hedd, A., Montevecchi, W.A., McFarlane Tranquilla, L.A., Burke, C.M., Fifield, D.A., Robertson, G.J., Phillips, R.A., Gjerdrum, C., and Regular, P.M. (2011). Reducing uncertainty on the Grand Bank: tracking and vessel surveys indicate mortality risks for common murres in the North-West Atlantic. <i>Animal Conservation</i>. <b>14</b>: 630-641.</p> <p>Hedd, A., Pollett, I.L., Mauck, R.A., Burke, C.M., Mallory, M.L., McFarlane Tranquilla, L.A., Montevecchi, W.A., Robertson, G.J., Ronconi, R.A., Shutler, D., Wilhelm, S.I., and Burgess, N.M. (2018). Foraging areas, offshore habitat use, and colony overlap by incubating Leach's storm-petrels <i>Oceanodroma leucorhoa</i> in the Northwest Atlantic. <i>PLoS One</i>. <b>13</b>(5): e0194389. <a href="https://doi.org/10.1371/journal.pone.0194389">https://doi.org/10.1371/journal.pone.0194389</a></p> <p>McFarlane Tranquilla, L.A., Montevecchi, W.A., Hedd, A., Fifield, D.A., Burke, C.M., Smith, P.A., Robertson, G.J., Gaston, A.J., Phillips, R.A. (2013). Multiple-colony winter habitat use by murres <i>Uria</i> spp. In the Northwest Atlantic Ocean: implications for marine risk assessment. <i>Marine Ecology Progress Series</i>. <b>472</b>:287-303.</p>	
IR-36	ECCC-06; WM-35	Section 6.2.2; Section 6.2.2.6; Section 6.2.4, Table 6.12	<p>Section 6.2.2 of the EIS identifies the Leach's Storm-petrel as designated as Vulnerable by the International Union for the Conservation of Nature (IUCN); however, does not provide further context for the "vulnerable" status of the species.</p> <p>Environment and Climate Change Canada advised that in addition to the Leach's Storm-petrel colonies in Baccalieu Island, Gull Island, and Green Island, documented population declines at the Great Island colony in Witless Bay should also be referenced in order to provide a more complete account of the populations within the range of the Project. The Great Island Leach's Storm-petrel colony has declined by 55 percent from 300,000 pairs in 1979 to 134,000 pairs in 2011 (Wilhelm et al. 2015).</p> <p><u>Reference</u></p> <p>Wilhelm, S.I., Mailhiot, J., Arany, J., Chardine, J.W., Robertson, G.J, and Ryan, P.C. (2015). Update and trends of three important seabird populations in the western North Atlantic using a geographic information system approach. <i>Marine Ornithology</i>. <b>43</b>: 211-212.</p>	<p>Provide further analysis on the potential effects of the Project on Leach's Storm-petrels taking into consideration potential threats to the species, population trends, and information provided in Wilhelm et al. 2015.</p> <p>Review International Union for the Consideration of Nature data to determine if additional marine or migratory bird species of conservation interest, in addition to Leach's Storm-petrel, are likely to occur in the Regional Assessment Area, and update the analysis of effects, as applicable.</p> <p>Update the effects predictions, potential mitigation and follow-up, as well as significance predictions, as applicable.</p>
IR-37	WM-34, -61	Section 9.3.3.1	<p>Section 9.3.3.1 of the EIS concludes that environmental effects will be localized with respect to the effect of waste discharges on marine birds. However, as noted in a submission from the public, discharge of gray water effluent can have a reefing effect around the platform and, as such, promotes algae growth leading to fish attraction (Wolfson et al. 1979; Baird, 1990). Burke et al (2012) have documented the phenomenon of nocturnal feeding by gulls that take up residency at the base of the Hibernia platform believed to be because of the abundance of food around the platform. Section 9.4 of the EIS provides the significance determination for the effects of the Project on marine and migratory birds. However, the effect of discharges causing a reef effect around platforms attracting birds and associated effects were not explicitly included.</p>	<p>Confirm the potential for discharges from the Project to result in a reef effect around platforms and associated implications for migratory birds. Update the analysis, mitigation and significance predictions, as applicable.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p><u>References</u></p> <p>Baird, P. H. (1990). Concentrations of seabirds at oil-drilling rigs. <i>Condor</i> 92, 768±771</p> <p>Burke, C.M., Montevecchi, W.A., &amp; Wiese, F.K. (2012). Inadequate environmental monitoring around offshore oil and gas platforms on the Grand Bank of Eastern Canada: Are marine birds at risk? <i>Journal of Environmental Management</i>, 104, 121-127. <a href="https://doi.org/10.1016/j.jenvman.2012.02.012">dx.doi.org/10.1016/j.jenvman.2012.02.012</a></p> <p>Morandin, L.A. and O’Hara, P.D. (2016) Offshore oil and gas, and operational sheen occurrence: is there potential harm to migratory birds? <i>Environmental Review</i> 24:285-318</p> <p>Wolfson, A., Van Blaricom, G., Davis, N. Lewbel, G.S. (1979). The marine life of an offshore oil platform. <i>Marine Ecology Progress Series</i>, 1, 81–89.</p>	
IR-38	ECCC-09, -10; WM-70	Section 9.3.3; Section 9.3.3.1; Section 9.3.5	<p>Section 9.3.1.1 of the EIS acknowledges that the recovery of birds are estimates based on incidental and not systematic observations; however, it is later stated that low mortality rates are anticipated as most stranded birds are successfully released according to previous monitoring.</p> <p>Environment and Climate Change Canada has advised that although the majority of stranded birds encountered on platforms and vessels are thought to be found alive and released successfully, without a systematic search methodology and documentation of search effort, it is difficult to quantify how many dead individuals may have been undetected during the searches.</p> <p>Monitoring in previous projects referred to in Section 9.3.3.1 of the EIS was undertaken opportunistically. Therefore, Environment and Climate Change Canada has advised that the information currently available is likely an underrepresentation of the number of individuals coming into contact with MODU and supply vessels. Dead birds may fall into the sea or fall victim to predation by scavengers before they are observed.</p> <p>Section 9.3.5 of the EIS states that effects on migratory birds are predicted to be low in magnitude and not likely to be significant. Environment and Climate Change Canada has advised that in the absence of systematic searches and documentation of stranded birds (live and dead), additional information is needed to support the conclusion that the project activities’ effects will be low in magnitude and uncertainties related to effects predictions require further discussion.</p> <p><u>Reference</u></p> <p>Bruinzeel, L.W., van Belle, J. and Davids, L. 2009. The Impact of Conventional Illumination of Offshore Platforms in the North Sea on Migratory Bird Populations. A&amp;W-rapport 1227. Alternburg &amp; Wymenga Ecologisch Onderzoek, Feanwalden</p>	Determine whether the certainty of effects predictions related to migratory birds requires revision, taking into account advice from Environment and Climate Change Canada. Explain the associated rationale and update the effects predictions accordingly.

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IR-39	ECCC-07, -08; KMKNO-32; WM-36, -39, -59, -70; MTI-14, -16	Section 9.3.2; Section 9.5; Section 14.3.4.1; Section 18.2	<p>Section 9.5 of the EIS states that, “For the duration of the drilling program for each well, routine systematic checks will be conducted for stranded birds on the MODU and PSVs [platform supply vessel] by trained personnel in accordance with Procedures for Handling and Documenting Stranded Birds Encountered on Infrastructure Offshore Atlantic Canada (ECCC 2016) and associated permit conditions under the MBCA [Migratory Birds Convention Act, 1994] authorizing the capture and handling of migratory birds. Results of the monitoring program will be shared publicly to help further improve the understanding of bird strandings and mortality in the Newfoundland and Labrador offshore area.”</p> <p>Environment and Climate Change Canada has advised that information is lacking concerning how the proponent would implement search protocols and document search effort for stranded migratory birds. The EIS refers to protocols for handling stranded birds, but handling protocols are distinct from systematic searching protocols.</p> <p>Environment and Climate Change Canada has noted that systematic deck searches for stranded birds undertaken by trained observers are more effective than opportunistic searches. Systematic searches should occur at least daily (preferably at dawn), with search efforts documented and observations recorded (including notes on efforts when no birds are found). Environment and Climate Change Canada has expertise in this area and is available to be consulted in the development of systematic monitoring protocols.</p>	<p>Taking into consideration the information provided by Environment and Climate Change Canada, confirm the following (or provide a rationale, in the absence of a confirmation):</p> <ul style="list-style-type: none"> <li>• develop a systematic monitoring protocol to search for and document stranded birds on the MODU and the platform supply vessels for the duration of the project activities, including drilling and flaring. Include search efforts and frequency;</li> <li>• engage Environment and Climate Change Canada in the development of systematic monitoring protocols;</li> <li>• have its Environmental Observers that would be engaged in seabird observations trained by Environment and Climate Change Canada;</li> <li>• verify the accuracy of the effect predictions with respect to birds, based on the data collected; and</li> <li>• annually report monitoring information, including data related to mortality, stranding and injury.</li> </ul>
IR-40	C-NLOPB-09; MTI-10; KMKNO-31	Section 2.3.3; Section 2.4.5; Section 9.3.2; Appendix B	<p>Section 2.4.5.1 of the EIS estimates that platform supply vessels will make a total of two to three round trips per week between the MODU and the supply base. Figure 4 in Appendix B indicates there is very little traffic in the Project Area at the current time. The EIS Guidelines require the predicted percentage increase in vessel traffic of similar size vessels resulting from the Project. This information, however, is not provided in the EIS. Section 2.4.5.1 states common shipping routes will be used as practicable to reduce incremental marine disturbance, although most common vessel traffic routes are located either to the north or south of the Project Area (refer to Figure 7.34). However, Figure 7.34 is a graph illustrating ground fish harvest within the Regional Assessment Area from 2012 to 2016. Figure 4 in Appendix B illustrates shipping traffic, which shows that Orphan Basin is not located in an area with established shipping routes.</p> <p>Figure 2.11 (Potential Vessel and Helicopter Routes) of the EIS shows Bay Bulls as a potential supply base port, yet the text only refers to St. John’s as the supply base port. Section 9.3.2 of the EIS states that platform supply vessel routes transiting to and from the MODU will be planned to avoid passing within 300 metres of migratory bird nesting colonies during the nesting period and will comply with provincial Seabird Ecological Reserve Regulations, 2015 and Environment and Climate Change Canada’s Avoidance Guidelines for seabird and waterbird colonies. The Agency notes Environment and Climate Change Canada’s Seabird and Waterbird Colonies: Avoiding Disturbance Guidelines states that a minimum distance of at least 300 metres from all areas of the colony occupied by seabirds and waterbirds would be used.</p>	<p>Discuss the expected increase in platform supply vessels in the Project Area due to the Project.</p> <p>Clarify if Bay Bulls and St. John’s are both potential supply base ports for the Project. If Bay Bulls is under consideration, update the effects analysis, as applicable.</p> <p>Confirm whether Environment and Climate Change Canada’s Seabird and Waterbird Colonies: Avoiding Disturbance Guidelines minimum distance of at least 300 metres would be used for all bird colonies or a specific subset.</p> <p>Discuss if additional measures are proposed to mitigate potential effects of platform supply vessel speeds on migratory birds, including avoidance or will be reduction of vessel speeds in areas of birded to avoid disturbing congregations of marine birds.</p>

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			The KMKNO requested platform supply vessels be required to reduce speeds (10-knot limit) when in the vicinity of a raft of marine birds and to avoid approaching congregations of marine birds.	
IR-41	KMKNO-01	Section 2.4.3; Section 2.9.2.5	<p>Section 2.9.2.5 of the EIS states when formation flow testing is carried out, flaring is required to safely dispose of hydrocarbons that may come to surface. An alternative to a formation flow test with flaring is a formation flow testing while tripping, which does not require flaring as part of the well test. However, a formation flow testing while tripping does not provide the same data as formation flow testing with flaring and therefore might not be a suitable alternative in all cases. It is stated that the proponent will consider this test option on a case by case basis to ensure well testing meets C-NLOPB requirements.</p> <p>Section 9.3.2 of the EIS identifies mitigation measures to reduce potential environmental effects of the Project on marine and migratory birds, including measures with respect to well evaluation and testing. No information is provided on formation flow testing while tripping, which in Section 2.9.2.5 was stated that it would be considered on a case by case basis to ensure it meets well testing requirements of the C-NLOPB.</p>	Discuss whether formation flow testing while tripping will be used if well testing is required, if it meets the requirements of the C-NLOPB.
IR-42	ECCC-04; WM-16, -37, -40, -42, -60; MTI-15	Section 2.9.2; Section 9.3.2; Section 9.3.3.1	<p>Section 2.9.2 of the EIS discusses planning flaring events such that they do not commence during periods of poor visibility, including at night or during inclement weather. Further, Section 9.3.2 discusses restricting flaring to a minimum required to characterize the well's hydrocarbon potential and as necessary for the safety of the operation, minimizing flaring during periods of migratory bird vulnerability, and the use of a water curtain to deter birds from the general vicinity. It is unclear how the mitigation measures mentioned above would be applied.</p> <p>Section 9.3.3.1 of the EIS states that 95 percent of strandings of Leach's Storm-petrels occur between 10 September and 13 October.</p> <p>Environment and Climate Change Canada identified the following mitigation measures that require consideration:</p> <ul style="list-style-type: none"> <li>notification to the C-NLOPB at least 30 days, as per the C-NLOPB's Measures to Protect and Monitor Seabirds in Petroleum-Related Activity in the Canada-Newfoundland and Labrador Offshore Area, in advance of flaring to determine whether the flaring would occur during a period of migratory bird vulnerability along with a description of how the proponent plans to prevent harm to migratory birds; and</li> <li>avoiding nighttime flaring (if possible), flaring during peak Storm-petrel fledging (mid-September to mid-October), and during the day when visibility is low due to fog.</li> </ul>	<p>Provide additional information on the measures to be taken to mitigate the effects of flaring on migratory birds, including:</p> <ul style="list-style-type: none"> <li>describe how flaring would be minimized during nighttime, poor weather conditions, and during periods of bird vulnerability;</li> <li>discuss whether it is feasible to schedule flaring outside of 10 September to 13 October;</li> <li>confirm if flare shields would be used during all flaring events; and</li> <li>confirm if there would be consultation with the C-NLOPB with respect to the timing of routine flaring at least 30 days in advance.</li> </ul> <p>Update proposed mitigation, as applicable.</p>
IR-43	WM-30, -38	Section 9.3.3.1; Section 9.4	Section 9.3.3.1 of the EIS states that there is a lack of data on the occurrence of oiling of sea birds around platforms. The data that does exist is lacking on the frequency, likelihood, persistence,	Given the lack of data related to potential oiling of sea birds around platforms from discharges of operational wastes, discuss the need for follow-up and monitoring of

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>fate, and thickness of sheens resulting from discharges. In addition, there is a lack of quantitative studies on the direct effects of sheens on sea birds.</p> <p>Section 9.4 of the EIS states that the overall determination of effects on birds is made with a moderate level of confidence given uncertainties in predicting the impact of attraction to artificial lighting and flaring on the MODU; however, there is no reference to the lack of data on the occurrence of oiling of sea birds.</p>	discharges, including potential sheen frequency, as well as associated effects on migratory birds.
<b>Species at Risk</b>				
IR-44	DFO-06	Section 6.1.7, Table 6.4	<p>Table 6.4 in Section 6.1.7 of the EIS has errors regarding the characterization of species at risk. Acadian Redfish, Smooth Skate and White Hake are Species at Risk or Species of Conservation Concern. Atlantic Halibut and Blue Shark are not Species at Risk or Species of Conservation Concern.</p> <p>There are also inconsistencies between the descriptions of potential occurrence in Table 6.4 and corresponding figures showing species distribution (e.g., Deepwater Redfish, Greenland Halibut, Witch Flounder).</p>	Update Table 6.4 to correct species at risk and species of conservation concern species characterization. Correct inconsistencies between descriptions of potential occurrence in Section 6.1.7 of the EIS and related figures (Figures 6.6 to 6.11). If figures have errors with species distribution, revise the figure and clearly illustrate the species presence in the Project Area.
IR-45		Section 6.2.4	<p>The Agency is the responsible authority for the environmental assessment of the Project and therefore must identify the adverse effects of the Project on listed wildlife species and their critical habitats under the <i>Species at Risk Act</i> and, if the Project is carried out, must ensure that specific measures are taken to avoid or lessen those effects and to monitor them. The measures must be consistent with any applicable recovery strategy and action plan. Furthermore, in recognition of the potential risks to species assessed by the COSEWIC, the Agency requires an assessment of effects on these species as well as an accounting of measures that could be taken to avoid or lessen effects and to monitor them. The EIS Guidelines require direct and indirect effects on the survival or recovery of federally listed species to be described (Section 6.3.6).</p> <p>The EIS does not explain how the mitigation measures for general valued components are consistent with applicable recovery strategies and action plans. In some cases management plans, recovery strategies, or action plans have not been referenced (e.g., Piping Plover, Red Knot and Ivory Gull are listed under the <i>Species at Risk Act</i> as endangered and the Ross's Gull is listed as threatened).</p>	<p>Update information related to species at risk taking into consideration the management plans, recovery strategies or actions plans for Piping Plover, Red Knot, Ivory Gull, Ross's Gull, and Red-necked Phalarope, as necessary.</p> <p>Provide a description of key threats to species at risk as included in applicable recovery strategies and action plans as relevant to the Project, as well as the potential contribution of project activities to these threats.</p> <p>Update the effects assessment, potential mitigation and follow-up, as appropriate, including a description of how mitigation measures are consistent with applicable recovery strategies and action plans.</p>
IR-46	DFO-04	Section 6.3.7	Section 6.1.5 of the EIS Guidelines requires inclusion of all potential or known federally listed species at risk and species designated by the <i>Committee on the Status of Endangered Wildlife in Canada</i> (COSEWIC), and their habitat within the areas that could be affected by routine Project operations or accidents and malfunctions. Section 6.1.5 of the EIS Guidelines further requires a discussion of the residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified and proposed critical habitat and/or recovery habitat (where	<p>Discuss the link between the habitat within the Exploration Licences, Project Area and Local Assessment Area, and the life history requirements or stages of the fish and marine mammal species at risk, including wolffish, identified in Section 6 of the EIS.</p> <p>Update the effects assessment and cumulative effects assessment, as necessary.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>applicable) and general life history of species at risk that may occur in the Project Area, or be affected by the Project.</p> <p>Section 6 of the EIS provides species descriptions for species at risk; however, Section 6 does not provide the life history of species at risk, in particular for wolffish species, in the context of the characteristics of the Project Area/Local Assessment Area. The link between the various life history stages of the species and whether the ELs, Project Area or Local Assessment Area have the features that would support the noted life history stages/requirements are not clearly stated in the EIS.</p>	
IR-47	DFO-07	Section 10.0; Section 15.5.3	<p>Section 6.3.6 of the EIS Guidelines state that potential adverse effects of the Project on species at risk and their critical habitat must be included in the EIS. Fisheries and Oceans Canada has noted that the EIS states that no identified critical habitat is present in the Project Area, Local Assessment Area, or Regional Assessment Area. However, spill trajectory modelling indicates a small probability that oil could reach the Gully Marine Protected Area and Sable Island National Park Reserve. The EIS does not discuss marine mammals and critical habitat in these areas that could be affected.</p>	<p>Describe marine mammal species at risk and their critical habitat in the Gully Marine Protected Area and Sable Island National Park Reserve area that could be affected by an accidental event. Update the effects assessment, as necessary.</p>
<b>Special Areas</b>				
IR-48	DFO-20; DFO-CL-09, -35	Section 6.4, Figure 6.30	<p>Section 6.4 of the EIS provides information on several special areas that may occur in the regional assessment area and that overlap with the Project Area. The Agency and Fisheries and Oceans Canada noted that:</p> <ul style="list-style-type: none"> <li>• additional Ecologically and Biologically Significant Areas (EBSAs) identified by the Conference of the Parties to the Convention on Biological Diversity located outside Canada's exclusive economic zone in the Northwest Atlantic, some of which overlap the assessment areas, have not been included in the EIS (<a href="https://www.cbd.int/ebsa/">https://www.cbd.int/ebsa/</a>) (e.g. Seabird Foraging Zone in the Southern Labrador Sea EBSA);</li> <li>• Table 6.24 gives the distance to the Project Area for the Eastern Avalon Coast EBSAs as 303 kilometers. However, the Eastern Avalon Coast EBSAs is within the Local Assessment Area, which includes the platform supply vessel route. Therefore, routine project activities (platform supply vessels) would be expected to intersect with the special area; and</li> <li>• the Bonavista Cod Box is not a recognized closure area and should be removed.</li> </ul>	<p>Update Figure 6.30 with appropriate resolution to include all special areas by type (e.g. Ecologically and Biologically Significant Areas identified by the Conference of the Parties to the Convention of Biological Diversity) that could be affected by the Project. Update Table 6.24 with the distance from each identified special area to nearest ELs and where there is the potential for platform supply vessels to intersect with the special area. The figure should include the following:</p> <ul style="list-style-type: none"> <li>• all special areas that occur within the Regional Assessment Area including those previously not identified in the EIS; and</li> <li>• removal of the Bonavista Cod Box.</li> </ul> <p>With respect to special areas that have not been included in the EIS, provide a description of the ecosystem and conduct an assessment of potential effects of the additional special areas. Identify proposed mitigation and follow-up, for routine activities and potential accidental events, as applicable.</p>
IR-49	KMKNO-27, -28	Section 6.4.1.4; Section 11.1.3; Section 11.1.4.2; Section 11.3; Section 11.3.3.1	<p>Section 6.1.9.1 of the EIS Guidelines requires that the EIS describe special areas. Section 6.4 of the EIS identifies various types of special areas within the Project Area and Regional Assessment Area, including marine refuges and lobster closure areas, ecologically and biologically significant areas, and valued marine ecosystems.</p> <p>Section 6.4.1.4 of the EIS states that 44 percent of the Northeast Newfoundland Slope Closure marine refuge falls within the Project Area. However, 100 percent of Exploration Licences 1145, 1146 and 1148 fall within the marine refuge. Table 6.21 in the EIS provides the rationale for its</p>	<p>Provide information regarding the ecosystem (e.g. oceanographic patterns, habitats critical to ecological processes, structural complexity, connectivity of habitats, etc) within Northeast Newfoundland Slope Closure marine refuge and how it relates to its special area designation. Update the effects analysis for each of the valued components present (fish, fish habitat, migratory birds, marine mammals, sea turtles, and commercial fish) to describe how Project activities could result in habitat loss or degradation to the Northeast Newfoundland Slope Closure.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>designation as an area of high density of corals and sponges with high biodiversity and that it is closed to bottom fishing activities.</p> <p>No further descriptions of the Northeast Newfoundland Slope Closure are provided. Additional information with respect to the ecosystem (e.g. oceanographic patterns, habitats critical to ecological processes, structural complexity, connectivity of habitats, etc) and how that relates to the Northeast Newfoundland Slope Closure is required to assess the potential effects of Project activities which may occur directly within the Northeast Newfoundland Slope Closure. The potential effects should be assessed for each of the valued components present (fish, fish habitat, migratory birds, marine mammals, sea turtles, and commercial fish).</p> <p>Figure 11.1 in Section 11.1.4.2 of the EIS illustrates the special area spatial boundaries; however, the potential zone of influence of project effects are not shown. The figure should illustrate the predicted areal extent of habitat degradation and loss resulting from drill muds and cuttings deposition based on Appendix B of the EIS, the extent of sound effects based on Appendix C, and potential spills based on Appendix D as well as the potential area over which light may affect the Northeast Newfoundland Slope Closure. Sections 11.2 and 11.3 of the EIS do not include a discussion of habitat loss or degradation, including a discussion of environmental effects from Project activities (drill cuttings deposition, sound, spills and light) could affect the baseline conditions described above that resulted in the special area being designated. Using this information update the effects analysis and describe how the Project activities could result in habitat loss or degradation to the Northeast Newfoundland Slope Closure.</p> <p>Section 11.5 of the EIS states that a follow-up program to address the uncertainty regarding residual effects of drill waste discharges on the marine benthic environment is proposed and would consist of a visual survey of the seafloor using a ROV after drilling activities to assesses the visual extent of sediment dispersion and validate drill waste modelling predictions. The KMKNO have suggested a benthic sampling program to determine infaunal recolonization rates following drilling.</p>	<p>Revise Figure 11.1 to illustrate the overlap between the Northeast Newfoundland Slope Closure and the zone of influence of project activities. Provide a discussion of habitat degradation and loss resulting from Project activities (drill cuttings deposition, sound, spills and light) that could affect the baseline conditions described above that resulted in the special area being designated.</p> <p>Discuss the need for and feasibility of a benthic sampling program to determine infaunal recolonization rates following drilling.</p>
IR-50	KMKNO-16	Section 6.4.1.6; Section 6.4.3.2; Section 11.3.3.1	<p>Section 6.4.1.6 and Section 6.4.3.2 of the EIS states that 22 percent of the total area of the Orphan Spur Ecologically and Biologically Significant Area and 0.5 percent of the Orphan Knoll Seamount Closure Vulnerable Marine Ecosystem falls within the Project Area, respectively. However, no additional information is provided on the Orphan Knoll Seamount Closure Vulnerable Marine Ecosystem.</p> <p>Table 6.25 in the EIS states that the rationale for the designation of the Orphan Spur Ecologically and Biologically Significant Area relates to high concentrations of corals, densities of sharks and species of conservation concern (e.g. Northern, Spotted and Striped Wolfish, skates, Roundnose Grenadier, American Plaice, Redfish). However, based on Fisheries and Oceans Canada (2013) referenced below, the information provided in the EIS is incomplete and does not discuss the Orphan Spur's importance to marine mammals and sea birds. Therefore, additional details are required in order to assess the potential effects from Project Activities.</p>	<p>Provide additional information on the importance of the Orphan Spur Ecologically and Biologically Significant Area to marine mammals and seabirds.</p> <p>Provide information on why Orphan Knoll was designated as a vulnerable marine ecosystem.</p> <p>Provide an updated environmental effects assessment for each valued component to describe how Project activities such as drill cuttings deposition, sound, and light could affect the following:</p> <ul style="list-style-type: none"> <li>• the Orphan Spur Ecologically and Biologically Significant Area;</li> <li>• the Orphan Knoll Seamount Closure Vulnerable Marine Ecosystem; and</li> <li>• special areas that are within the predicted zones of influence from various project activities such as drill cuttings deposition, sound, and light.</li> </ul>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>The environmental effects assessment for each valued component should be updated based on the additional information above to describe how Project activities could affect the Ecologically and Biologically Significant Areas and Vulnerable Marine Ecosystems within the predicted zones of influence from various project activities such as drill cuttings deposition, sound, and light.</p> <p>Tables 6.24 and 6.29 of the EIS indicate the proximity of several special areas to the Project Area. However, the EIS does not indicate which special areas are within the predicted zones of influence from various project activities such as drill cuttings deposition, sound, and light.</p> <p>As with the IR above, Figure 11.1 in Section 11.1.4.2 of the EIS should be updated to illustrate the overlap of the potential zone of influence from Project activities (e.g. drill cuttings deposition, sound, spills and light) with the special areas. The EIS does not contain a discussion of the potential degradation and loss of habitat for the specific valued components that resulted in the special area designation.</p> <p><u>Reference</u> Department of Fisheries and Oceans Canada (2013). Identification of Additional Ecologically and Biologically Significant Areas (EBSAs) within the Newfoundland and Labrador Shelves Bioregion. Canadian Science Advisory Secretariat Science Advisory Report 2013/048.</p>	<p>Update Figure 11.1 to illustrate the overlap between special areas and the zone of influence of project activities. Provide a discussion of potential degradation and loss of habitat for the specific valued components that resulted in the special area designation.</p>
IR-51		Section 8.3.3.2	<p>Section 8.3.3.2 of the EIS states that there is a Significant Benthic Area for sea pens at the edge of the Northeast Newfoundland Slope, that encompasses exploration license 1145 and a small portion of Exploration Licences 1146 and 1148. The proponent states that given the overlap with the sea pen area there could be a change in habitat quality or use for habitat provided by sea pens in these areas. However, the proponent does not describe sea pen habitat, the features and parameters of habitat that could change, the importance of the habitat in an ecological context to benthic species or the benthos assimilative capacity from discharges and waste disposal.</p>	<p>Describe sea pen habitat with respect to ecological processes that govern their presence.</p> <p>Describe potential effects of change in habitat quality or use by benthic animals from discharges and emissions.</p>
IR-52	DFO-24 WM-51	Appendix B	<p>Appendix B of the EIS presents the environmental effects assessment for benthic effects of drilling waste deposition, which considers smothering as a significant and short-term effect over the threshold of 6.5 millimetres. Fisheries and Oceans Canada noted that it does not take into account the more recent literature on effects on sensitive benthic species and the potential for interference with feeding etc. or the recent studies of Trannum et al. (2010) where benthic communities were affected by 3 millimetres of water based mud.</p> <p>Similar exploration drilling projects in the Newfoundland offshore have noted that some species may be more susceptible to shallower burial depths and a more conservative probable no effect threshold of 1.5 millimetres has been applied.</p> <p><u>Reference</u></p>	<p>Taking the Trannum, et al. (2010) reference into consideration, provide a discussion of the potential effects of drilling waste deposition, other than smothering, on benthic species, including benthic species in special areas.</p> <p>Discuss the rationale for burial threshold of 6.5 millimetres versus the more conservative 3.0 or 1.5 millimetres thresholds.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			Tranum, Hilde & C. Nilsson, Hans & Schaanning, Morten & Øxnevad, Sigurd. (2010). Effects of sedimentation from water-based drill cuttings and natural sediment on benthic macrofaunal community structure and ecosystem process. <i>Journal of Experimental Marine Biology and Ecology</i> . 383. 111-121.	
IR-53	WM-24	Section 11.3.4	Section 11.3.4 of the EIS concludes that the Project has the potential to result in residual adverse environmental effects from a change in habitat quality in special areas that exist within the Project Area and along the vessel transit routes in the Local Assessment Area. Table 11.5 in Section 11.3.4 of the EIS states that the residual effects of discharges are reversible on special areas. However, it is not explained in the EIS how the effects of drill mud and cuttings on corals is reversible taking into account ecological considerations such as: slow recovery rates for corals and sponges, restoration process of anoxic sediments from bacteria degradation of drill wastes; recolonization processes, the presence of source subpopulations, population dynamics, oceanographic regime, and habitat requirements.	Discuss how the residual adverse environmental effects resulting in a change in habitat quality within the special areas would be reversible taking into account ecological considerations. Update the predicted effects analysis, as required.
IR-54		Section 11.3; Section 11.3.3.1; Section 11.3.4	Section 11.3 of the EIS shows that the residual effects summary with respect to special areas is contradictory in some places. Examples include: <ul style="list-style-type: none"> <li>Table 8.5, Table 9.5, Table 10.5 are inconsistent with the magnitude, geographic extent, duration, and frequency residual environmental effects with those determined in Table 11.5 for Special Areas. Clarification is required as to why the residual effects would be considered different for fish, birds and marine mammals as a whole compared with a special area which is designated to protect these species.</li> <li>Section 11.3.3.1 describes the changes in habitat quality from well abandonment and decommissioning. This section states that the residual effects are predicted to be low in magnitude, localized to the wellsite, long-term in duration, irregular, and will be reversible as the wellhead, if left in place, would remain there in perpetuity and provide colonization opportunities for benthic species. This is inconsistent as if the wellhead remains in place for perpetuity it means that it is not reversible.</li> </ul>	Provide clarifications and corrections to the residual effects conclusions with respect to special areas by updating Table 11.5 or provide a rationale for the difference in the residual effects analysis.
<b>Indigenous Peoples</b>				
IR-55		Section 10.1.2	Section 5 of the EIS Guidelines requires “changes made to the project design and implementation directly as a result of discussion with potentially affected groups.”  Section 10.1.2 of the EIS indicates that during consultations with Indigenous groups the following concerns were raised: potential Project-related effects on marine mammals, particularly on SARA-listed species including the Blue Whale and the North Atlantic Right Whale; and potential effects on seals which are harvested as a country food. No information is provided on whether changes may have been made to the project design and implementation as a result of discussions with Indigenous groups.	Confirm if any changes were made to the proposed project design and implementation to address the concerns Indigenous groups identified with respect to marine mammals (including SARA-listed) and seals and if so, describe the changes.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
IR-56	KMKNO-35, -36; MTI-07, -08, -09, -19, -21	Section 3.2; Section 4	<p>Section 4.3 of the EIS Guidelines state that the proponent will consider the use of both primary and secondary sources of information regarding baseline information, changes to the environment and the corresponding effect on health, socio-economics, physical and cultural heritage and the current use of lands and resources for traditional purposes.</p> <p>The KMKNO identified primary sources of information as including traditional land use studies, socio-economic studies, heritage surveys or other relevant studies conducted specifically for the Project and its EIS. Often these studies and other types of relevant information are obtained directly from Indigenous groups. Secondary sources of information could include previously documented information on the area, not collected specifically for the purposes of the project, or desktop literature based information.</p> <p>Several Indigenous groups have indicated that the EIS does not use Indigenous Knowledge in its valued components baseline information or environmental effects analysis (e.g., in conclusions on interactions with Atlantic Salmon, Bluefin Tuna, and swordfish in the project area). Indigenous groups advise that traditional knowledge should be used to assist in developing mitigation, environmental protection plans, and Project monitoring.</p>	<p>Clarify whether any primary information was used in preparing the EIS and if so, describe the primary information used. If not, provide a rationale for only using secondary sources of information, particularly related to land and resources use, fishing activity, health and socio-economic issues. Include consideration of additional information obtained during proponent workshops held in St. John's (October 10, 2018), Quebec City (October 15, 2018), and Moncton (October 18, 2018), as applicable.</p> <p>Discuss whether the proponent is considering collecting further Indigenous knowledge from Indigenous communities and if funding an Indigenous Knowledge study is being considered. If so, advise when this information would be available, and how it would be utilized, including how it could be used in the current assessment, the design and implementation of follow-up and monitoring programs, and further mitigations. If no additional Indigenous knowledge is planned to be collected, provide a rationale for why this would not be necessary.</p>
IR-57	CIE-01	Section 6.1.9	<p>Section 6.1.9 indicates that there is limited information on Atlantic Salmon Designable Units, including their ocean distribution and migration." Where data does exist, it is based on tagging studies of salmon from a limited sample of river systems (Hedger et al. 2009; Jacobs 2011; Lefèvre et al. 2012; Lacroix 2013; Strøm et al. 2017) or it is inferred from the genetic composition of commercial fisheries catch data (Bradbury et al. 2015; Bradbury et al. 2016a, Bradbury et al. 2016b)...This information is subject to change as future studies are completed."</p> <p>It is unclear whether future studies refers to specific work contemplated by the proponent. Table 3.6 in the EIS indicates that the proponent in collaboration with other Newfoundland operators, is working with communities to identify potential industry-funded research opportunities including Indigenous knowledge and research studies related to Atlantic Salmon.</p>	<p>Provide an update on research collaborations that have been identified, and agreements that are in place, if any to improve understanding of Atlantic Salmon, American Eel or other migratory species in the marine environment and their potential interaction with oil and gas activity in the offshore of Newfoundland. Elaborate on the research areas that are being studied, by whom, how this data will/may improve certainty with respect to impact predictions, for the current and future projects, and how Indigenous groups may be engaged in developing research plans. Indicate how data will be disseminated, including whether results of research initiatives will be shared with other operators in the Newfoundland offshore, Indigenous communities, and the public.</p>
IR-58	KMKNO-38; MTI-18; NG-01	Section 12.3	<p>Section 12. of the EIS states that a Fisheries Communication Plan (FCP) will be used to facilitate coordination with fishers and an Indigenous Fisheries Communication Plan (IFCP) will be used to facilitate coordinated communication with Indigenous fishers. Details of the safety zone will also be communicated during ongoing engagement with commercial and Indigenous fishers. The proponent also plans to engage Indigenous communities to share Project details as applicable and facilitate coordination of information sharing. The Indigenous Fisheries Communication Plan will include procedures for informing fishers of an accidental event and appropriate response, however the following information is unclear in the EIS:</p> <ul style="list-style-type: none"> <li>• whether the Indigenous Fisheries Communication Plan differs from the Fisheries Communication Plan;</li> <li>• whether Indigenous groups would be able to raise issues and concerns to the proponent;</li> </ul>	<p>Provide additional information on the Indigenous Fisheries Communication Plan, including a discussion of the following:</p> <ul style="list-style-type: none"> <li>• how the Indigenous Fisheries Communication Plan differs from the Fisheries Communication Plan;</li> <li>• whether the Indigenous Fisheries Communication Plan would include measures to ensure that issues and concerns can be raised by Indigenous groups during the life of the Project and how this could occur, and if so, describe those measures;</li> <li>• whether the proponent would consider an adaptive approach to allow for harvester feedback over the life of the Project and how this could occur;</li> <li>• the frequency of updates to Indigenous communities about planned activities given potential for changes in operations, and the potential need for frequent</li> </ul>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<ul style="list-style-type: none"> <li>whether an adaptive approach would be used to allow for harvester feedback;</li> <li>the frequency of updates to Indigenous fishers on planned project activities; and</li> <li>which Indigenous fishers would be included in the development of the Indigenous Fisheries Communication Plan and their role in monitoring and follow up planning.</li> </ul>	<p>communication over the life of the Project, for example monthly updates throughout Project execution to fishers; and</p> <ul style="list-style-type: none"> <li>the role of Indigenous fishers in the development of the Indigenous Fisheries Communications Plan and the on-going role of Indigenous fishers in monitoring and follow-up plans, including for accidents and malfunctions. Provide information regarding whether reporting and results of monitoring and follow-up programs would be available to Indigenous fishers.</li> </ul>
IR-59	KMKNO-29; NG-01	Section 13.3.2	<p>Section 13.3.2 of the EIS states that the proponent will develop and implement a compensation program for damages resulting from Project activities, and that the compensation program will be developed in consideration of C-NLOPB guidelines, including the <i>Compensation Guidelines Respecting Damages Relating to Offshore Petroleum Activities</i>.</p> <p>However, it is unclear in the EIS how the proponent intends to develop the compensation program in collaboration with potentially-impacted parties, including commercial and communal commercial fishers.</p> <p>In addition, it is not evident how or if the proponent will include members of the international fishing community and Northwest Atlantic Fisheries Organization (NAFO) authorities in the development of the compensation plan.</p>	<p>Discuss if, and how, commercial, international and communal commercial fishers will be engaged in the development of the proposed compensation program.</p> <p>In addition, discuss how the proponent would ensure that potentially impacted parties are aware of the C-NLOPB guidelines and the proposed compensation program and know how to raise compensation claims.</p>
IR-60	MTI-18, -20, -22, -23, -24; KMKNO-43; MTI-02; NORPEN-06	Section 3.2.9; Section 15.3.1; Section 15.3.3	<p>Section 3.2.9 of the EIS states that the proponent "... will continue to notify, communicate with, and engage the Indigenous groups ... about key steps in the environmental assessment process including opportunities to provide comment on key documents and/or information to be provided regarding their community." MTI expressed an interest in having a role in the development and implementation of oil spill response plans, other contingency plans, exercises and training.</p> <p>MTI noted that it would be beneficial implementing an Indigenous advisory committee and Indigenous Guardian-type program whereby Indigenous communities, including MTI, can be involved in monitoring oversight in addition to emergency response readiness (including provisions for training capacity). The mechanisms by which Indigenous groups will continue to be notified, communicated with and engaged should be described.</p> <p>Section 15.3.3.3 of the EIS states that stakeholder and Indigenous input, including traditional knowledge and input on ecological and socio-economic priorities for response, would be coordinated through the Incident Command System process.</p> <p>The KMKNO stated that it is not clear in the EIS how the proponent would involve Indigenous groups, not only fishers, in the development and implementation of contingency plans.</p> <p>Similarly, specifically with respect to the Spill Response Plan, Section 15.3.1 of the EIS states that "Information about environmental and socio-economic sensitivities and potentially affected Indigenous groups and stakeholders will also be included in the plan." However, there is no</p>	<p>Confirm the role of Indigenous groups in the development and implementation of oil spill response plans and other contingency plans, exercises and training. Confirm if Indigenous groups will be provided with versions of these plans when they are finalized.</p> <p>Discuss the potential to implement Indigenous advisory committee and/or Indigenous Guardian programs for the Project. Describe mechanisms by which Indigenous groups will continue to be notified, communicated with and engaged.</p> <p>Confirm and describe the role of outside parties, including but not limited to Indigenous groups (not only fishers) and stakeholders, in the development, review and implementation of the Spill Response Plan and other emergency response and contingency plans, including emergency response and preparedness planning, exercises and training.</p> <p>In addition, confirm if Indigenous groups will be provided with the approved versions of contingency and response plans.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			indication on how the information will be collected, or how Indigenous groups and stakeholders will contribute to the process.	
IR-61			Section 6.3.7 of the EIS Guidelines requires a description and analysis of how changes to the environment caused by the Project would affect current use of resources by Indigenous peoples for traditional purposes. IR-11, -12, -16 and -17 requested an update of the effects assessment, the effects analysis on current use of resources by Indigenous peoples for traditional purposes should also be updated.	Utilizing the updated effects analysis required in IR-11, IR-12, IR-16, and IR-17, update the effects assessment on current use of resources by Indigenous peoples for traditional purposes.
<b>Commercial Fisheries</b>				
IR-62		Section 13.3.3.1	Section 7.2.6 of the EIS presents data related to the harvest weight and species composition of international fisheries occurring in NAFO Divisions 2J+3KLMNO. While the location of domestic harvest is illustrated (Figures 7.19, 7.23, and 7.26-32), there is no discussion of the level of activity of international harvest within the project area or the Exploration Licence outside the exclusive economic zone. Likewise, Section 13.3.3.1 of the EIS states Exploration Licence 1149 is in an area where there is little domestic harvesting activity. However, a discussion of international harvest occurring in Exploration Licence 1149 is not provided.	Discuss the location, harvested weight and species of international harvest occurring within the project area outside the exclusive economic zone, specifically in Exploration Licence 1149.
IR-63		Section 7.2.3.1	Section 7.2.3.1 of the EIS describes domestic fishing activity within the Project Area and states that the Project Area falls within the Northeast Newfoundland Slope Closure marine refuge that is closed to all bottom contact fishing activity. However, the EIS does not discuss if fisheries utilizing non-bottom contact gear are active within the marine refuge particularly in the portion that overlaps with the Project Area.	Provide clarification on if there are active fisheries in the Northeast Newfoundland Slope Closure marine refuge that use gear other than that used for bottom contact fishing. If there is fishing utilizing non-bottom contact gear, within the marine refuge that overlaps with the Project Area, provide a discussion of the fishery and the potential environmental effects of the project and mitigation and follow-up, as necessary.
IR-64	DFO-05	Section 7.2.1.2; Section 7.2.6, Figure 7.13, Table 7.7	Section 7.2.1.2 of the EIS states that “[o]utside the exclusive economic zone, data on international harvesting activity were obtained using the STATLANT 21A and 21B datasets from NAFO. These datasets present harvesting information in metric tonnes and are available up to 2017. This information captures information on harvesting activities for both Canadian and non-Canadian vessels actively fishing outside the exclusive economic zone and within the NRA [NAFO Regulatory Area].”  Fisheries and Oceans Canada noted that the STATLANT21A and 21B database contains domestic catch data from NAFO areas both inside and outside the exclusive economic zone, i.e., STALANT data is not restricted to harvest data from outside the exclusive economic zone. It is not clear if the data presented in the EIS includes domestic catch harvested outside the exclusive economic zone as indicated.	Clarify whether the Canadian harvest data presented in the EIS as being from outside the exclusive economic included harvest from within the exclusive economic zone. If Canadian harvest data from within the exclusive economic zone was included indicate the percent or quantity of harvest that was within the exclusive economic zone, revise statements, tables and figures as necessary.  Based on the reanalysis of the data, update effects analysis, proposed mitigation and follow-up as well as significance predictions, as applicable.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			Further, Fisheries and Oceans Canada noted that Figures 7.13 to 7.16 and Table 7.7 appear to have used an interpretation of STATLANT data as harvest data completely from outside the exclusive economic zone.	
<b>Accidents and Malfunctions – Spill Scenarios</b>				
IR-65	C-NLOPB-15	Section 15.2.2.2	Section 15.2.2.2 of the EIS discussed the probability of a blowout incident based on an analysis of historical data. The Canada-Newfoundland & Labrador Offshore Petroleum Board has advised that the probability of a blowout is not properly calculated. The Canada Newfoundland & Labrador Offshore Petroleum Board stated that the probability can be modelled as a binomial distribution to obtain a probability or expressed as likely number of blowouts if one multiplies the probability per-well by the number of wells to be drilled.	Discuss the approach taken for determining the probability of a blowout over the life of the project and provide a revised probability of a blowout over the life of the project, if applicable.
<b>Accidents and Malfunctions – Model Inputs</b>				
IR-66	ECCC-20	Section 15.4.5, Table 15.8; Appendix D, Table 5.6	Section 15.4.5 of the EIS states that currents, winds, sea ice, as well as other metocean factors, influence the fate and behavior of oil following a spill. The EIS states that metocean data, available from a number of sources, is formatted to work in the OSCAR model. Section 15.4.5 of the EIS provides the information related to the metocean data parameters inputs for the spill model (OSCAR), however, there was no information presented on how the data was used from these sources.  Environment and Climate Change Canada indicated that in order to have confidence in the input parameters used in the OSCAR model, an understanding of the calculations undertaken in OSCAR to produce wave heights and wind induced current, is necessary.	With respect to the OSCAR model inputs, provide the following: <ul style="list-style-type: none"> <li>• information on how wave height were calculated; and</li> <li>• information on how wind induced currents were calculated.</li> </ul>
IR-67		Section 15.5.1.3	Section 15.5.1.3 of the EIS provides an effects analysis of a synthetic-based mud spill from the mobile offshore drilling unit or marine riser based on modelling conducted by for Nexen Energy's Flemish Pass Exploration Project in Exploration Licence 1144 located to the south of the Project Area.  Section 15.5 of the EIS states that the modelling results from the Nexen Energy synthetic-based mud model were applicable based on the wellsite location similar water depth to the West Orphan Basin wellsite. However, other environmental parameters that may influence the model results require consideration as the modelled area has different oceanographic conditions than oceanic conditions found in this Project's Area.  Synthetic-based mud modelling conducted by Nexen Energy for their Flemish Pass Exploration Drilling project was based on an accidental surface release of synthetic-based mud; Nexen did not consider a wellhead release at the seafloor when modelling a spill of synthetic-based mud.	Describe the applicability of Nexen Energy's Flemish Pass Exploration Project synthetic-based mud spill modelling for the current Project given the differences in oceanographic conditions. Discuss the potential environmental effects that the oceanographic conditions in the Project Area may have on the synthetic-based mud spill modelling.  Describe how the predicted effects would change if a synthetic-based mud spill occurred at the wellhead rather than at the surface.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			The potential environmental effects of a release of synthetic-based mud at the seafloor is required given the overlap of the Project Area with special areas that are designated to protect coral and sponge habitat.	
IR-68	NRCan-06	Appendix D	Natural Resources Canada advised that the oil spill trajectory modelling appears to assume that oil pour point temperature is below the deep-water temperature; however, this is not necessarily the case. As such, Natural Resources Canada advises that there is a strong potential that the oil from the test region would have pour points above the deep water temperatures of the area. The impact of this is that the crudes may not disperse as the proponent suggests, but may instead solidify into solid particles on their way to the surface. This would change the predicted behaviors modelled results.	Provide the rationale for the selection of crude oil characteristics input into the model, considering the estimated fluid properties of the reservoir and the water temperatures. Confirm whether there is an error in the modeling related to oil pour point temperatures specific to this region. If this was not an error, discuss the implications of the pour point being above the deep-water temperature on the modelled results. Update the effects assessment, as required.
IR-69	NRCan-08	Appendix D	Natural Resources Canada stated that standard gas chromatography instruments cannot measure heavy ends contents so the proponent residue contents beyond Boiling Point > 380°C are not quantitative representations of residue contents for the crudes. Natural Resources Canada indicated that information on the techniques used to quantify heavier ends with boiling points greater than 380°C are applicable to assess the fate of hydrocarbons in a potential spill.	Discuss the techniques used to quantify heavier ends with boiling points > 380°C in the analysis, providing information on how true boiling point data, wax and asphaltene contents were used.
IR-70	NRCan-05, -07	Section 15.2.2.2; Appendix D	Appendix D of the EIS presents the results of the oil spill trajectory modelling. The presentation of the mass balance results illustrated a sunken oil component. However, there was no discussion on the origin of the sunken oil components or the potential environmental effect of sunken oil on sensitive areas.  In addition, Natural Resources Canada advised it was not clear how the heavy ends of the crude oil were accounted for in the model.	Provide an explanation of the sunken oil, including a description of how it formed and the potential environmental effects of sinking oil on sensitive areas.  Discuss how the model accounted for the heavy ends of the hydrocarbons, and how this fraction is related to the proportion of the oil that sank.
IR-71		Appendix B	Section 1 of Appendix B of the EIS states the drill mud and cuttings dispersion modelling accounted for likely discharges for the entire well drilled over a 30 day period, including water-based mud (WBM) discharges at seafloor for initial hole sections (pre-riser installation), bulk WBM discharges, and treated synthetic-based mud (SBM) associated cuttings from the MODU, post-riser installation. However, the EIS states that each well will take 60 days to drill. It is unclear how the modelling for 30 days is applicable in a 60 day context.	Provide the rationale for modelling a 30-day well drilling period when it is expected to take 60 days to drill a well. Discuss the potential environmental effects of a well drilling period consistent with the estimated length of time for well drilling in the Project.
IR-72		Section 15; Appendix D	Oil spill dispersion modelling (stochastic) completed for the EIS set an eastern model boundary to 30° longitude. Figures in Section 15 of the EIS and in Appendix D illustrating model results show that a potential spill may extend beyond the model domain. As a result, the potential for shoreline contact, including in international jurisdictions, is unclear.	Provide a rationale for the selection of boundaries for stochastic modelling. Discuss the limitations of the truncated spatial extent of spill dispersion results, including the implication for transboundary effects.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
<b>Accidents and Malfunctions – Model Results</b>				
IR-73	ECCC-18	Section 15.4.7.1; Section 7.2.2.1 of Appendix D	Figure 7.67 in Section 7.2.2.1 of Appendix D in the EIS illustrates that the terminal level for plume dynamics in the East Orphan Basin is between 2100-2700 mbsl. The Agency noted that based on this figure a larger proportion of oil would be expected to be in the dissolved phase deeper than the top 100 metres of the water column as is shown in the East Orphan Basin figures. Environmental effects on species inhabiting the water column below 100 metres water depth could be underestimated if only the top 100 metres of water depth is considered.  Environment and Climate Change Canada stated that it is unclear how the results for subsea transport below the 100 meter depth and the related oil-in-sediment fates, as described in Appendix D, are included in the conclusions in Section 15.4.7.1.	With respect to sub-sea transport of oil below 100 metres and the related oil-in-sediment fates discuss the following: <ul style="list-style-type: none"> <li>the rationale for assessing the concentrations of dissolved phase hydrocarbons in the top 100 metres of the water column even if this does not represent the maximum concentration of hydrocarbon;</li> <li>the potential for transport at depth of the dispersed plume leading to suspended particles and benthic sedimentation fates, including the possible interactions with effects such as pycnoclines and thermoclines as well as possible benthic currents. (This could be limited to the stochastic results for the vertical water column of the subsea releases in figures F7.22 and F7.33 in Appendix D, as well as in the Appendix D annexes for the water column profile environmental data.) and</li> <li>predictions for impacts on benthos (as area maps), indicating the areal extent of potentially-affected sediments;</li> </ul>
<b>Accidents and Malfunctions - Effects</b>				
IR-74		Section 15.5.2.3	Section 15.5.2.3 of the EIS discusses the potential effects of an accident or malfunction on marine and migratory birds. With respect to a marine diesel spill, it states that upon contact with the shoreline diesel tends to penetrate porous sediments quickly and washes off quickly by waves and tidal flushing. However, there is no discussion of how the shoreline geology of Newfoundland and Labrador may influence the predicted environmental effects of a marine diesel spill in the nearshore environment on marine and migratory birds, including the duration of residual effects.	Discuss how the shoreline geology of the Newfoundland and Labrador may influence the predicted environmental effects of a marine diesel spill in the nearshore environment on marine and migratory birds including the duration of residual effects.
IR-75	MTI-01	Section 15.5.1	Section 15.5.1 provides the effects assessment for accidents and malfunctions on marine fish and fish habitat. However, effects of an oil spill were not considered for Atlantic Salmon, particularly effects on migration through avoidance of oiled areas.	Discuss how a spill may interact with migratory species such as Atlantic Salmon, and whether significant disturbance or avoidance behaviour may occur. Update proposed mitigation and follow-up, if applicable.
IR-76	DFO-11; WM-29	Section 15.5.1.1	Section 15.5.1.1 of the EIS states that larval and juvenile pelagic and benthic fish species are at a greater risk of exposure as they are often less motile than adults and have shown higher sensitivity to lower concentrations of hydrocarbons.  Fisheries and Oceans Canada stated that this statement does not consider that one of the primary factors that may increase the potential impact of oil spills / accidents to juvenile fish and fish larvae is that for the most part they are suspended within the pelagic zone of the water column which is where components of oil spills will travel prior to reaching the surface.	Describe the potential effects of an accidental event / oil spill on pelagic fish larvae and juveniles with consideration of the zone of the water column in which the components of the oil spill will travel prior to reaching the surface and the pelagic zone that fish larvae and juveniles would be expected to reside.

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			While the sensitivities of larvae and juvenile pelagic and benthic fish species were identified, there was no discussion of the link between the timing of the sensitive periods, the pelagic zone that support these life stages, and the potential effects of an accidental event if it were to occur.	
IR-77	ECCC-15	Section 15.5; Section 15.5.2; Section 15.5.2.1	<p>Section 15.5.2.1 of the EIS states that there are few studies related to the effects of chemically-treated oil on the thermal balance of birds and differing opinions on whether they should be employed to reduce effects on seabirds. However, a review of the effects of oil pollution, chemically treated oil, and cleaning on the thermal balance of birds indicated that the effects of contamination by oil-dispersant mixtures may be similar to that of the oil alone, with results of one study indicating that oil treated with dispersants may be more harmful to birds than untreated oil (Jenssen 1994 and references therein).</p> <p>Environment and Climate Change Canada advises that two additional references, Fiorello et al. 2016 and Whitmer et al 2018, which describe the possible negative impacts of dispersants on birds should be considered in the analysis.</p> <p><u>References</u></p> <p>Fiorello, C.V., Freeman, K., Elias, B.A., Whitmer, E., and Ziccardi, M.H. (2016). Ophthalmic effects of petroleum dispersant exposure on common murre ( <i>Uria aalge</i>): An experimental study. <i>Marine Pollution Bulletin</i>. <b>113</b>:387-391.</p> <p>Whitmer, E.R., Elias, B.A., Harvey, D.J., and Ziccardi, M.H. (2018). An Experimental Study of the Effects of Chemically Dispersed Oil on Feather Distribution and Waterproofing in Common Murres ( <i>Uria aalge</i>). <i>Journal of Wildlife Diseases</i>. <b>54</b>(2): 315-328</p>	Taking into consideration information from Fiorello et al 2016 and Whitmer et al 2018, provide an updated discussion on the potential effects of dispersant use on marine and migratory birds.
IR-78		Section 9.1.3; Section 9.3.1; Section 9.3.5	<p>The EIS Guidelines require that direct and indirect adverse effects on migratory birds, including effects of oil spills in the nearshore or that reach land on landbird species, are examined. Important Bird and Biodiversity Areas and seabird colonies are located on the eastern Avalon Peninsula that could be affected by a spill.</p> <p>Section 15.5.2.3 of the EIS discusses the potential environmental effects of accidents and malfunctions on marine and migratory birds. With respect to marine diesel spills from a platform supply vessel, the EIS presents information from the modelling for a vessel collision completed from the Nexen Energy ULC Flemish Pass Exploration Drilling Project offshore Newfoundland and Labrador. The modelled site was in the offshore, approximately halfway between St. John's and the defined Project Area for the Nexen Energy ULC Flemish Pass Exploration Drilling Project. Results of the modelling predicted no shoreline contact. However, no description is provided in the EIS of the potential effects of a vessel collision in close proximity to the shore.</p>	Provide a discussion on the potential effects of a spill on coastal species and habitats, including marine and migratory birds, if a vessel collision was to occur in close proximity to shore.

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IR-79	KMKNO-12	Section 15.5.1.1	Section 15.5.1.1 of the EIS states that studies have shown that bacterial respiration, through biodegradation of hydrocarbons, has the potential to cause oxygen depletion, eventually leading to hypoxia in the areas near spills. However, the size of the potential area of affected by hypoxia and the potential effects on species is not discussed.	Discuss the size and potential impacts of hypoxia to species as the result of a potential spill.
<b>Accidents and Malfunctions – Emergency Planning and Response</b>				
IR-80	ECCC-27, -14	Section 15.3.3.3; Section 15.5.2.3	<p>Section 15 of the EIS discusses oiled wildlife response, stating that an Oiled Wildlife Response Plan will be developed in conjunction with the OSRP, and that PB will engage specialized expertise to implement the plan, including the recovery and rehabilitation of wildlife species as needed).</p> <p>No further information is provided on the Wildlife Response Plan.</p> <p>Environment and Climate Change Canada noted that all emergency incidents can potentially affect wildlife, and that during these incidents Environment and Climate Change Canada acts as a resource agency, which sets wildlife emergency response standards and guidelines related to migratory birds and species at risk under its jurisdiction. As such, wildlife response requires a Wildlife Emergency Response Plan, which is a component of the Incident Command System for pollution incidents affecting wildlife, and should address all of the various procedures and strategies required to mount an effective wildlife response. At minimum, a Wildlife Emergency Response Plan must include the following information:</p> <ul style="list-style-type: none"> <li>• information on the wildlife potentially at risk in the area;</li> <li>• mitigation measures to deter non-affected wildlife from affected areas;</li> <li>• mitigation and response measures to be undertaken if wildlife and/or sensitive habitats become contaminated by the incident (including treatment of oil-affected wildlife); and</li> <li>• the type and extent of wildlife monitoring that would be conducted during and following a pollution incident.</li> </ul>	Taking into consideration the information provided by Environment and Climate Change Canada, provide further information on the proposed Wildlife Emergency Response Plan, including who would be involved in its development, the timing of its preparation, standard content including likely mitigation measures, how the plan would be implemented and how data and information collected during its implementation would be used.
IR-81		Section 15.5; Section 15.3	Section 15 of the EIS states that a SIMA will be conducted that will inform the selection of an overall spill response strategy for the Project. However the EIS does not explain how the SIMA is conducted, what is included in the assessment, how it enables spill responders and stakeholders to choose the best response option.	<p>Provide information on the Spill Impact Mitigation Assessment (SIMA), including:</p> <ul style="list-style-type: none"> <li>• how the SIMA is conducted;</li> <li>• what is included in the assessment; and</li> <li>• identify who the stakeholders are that would be involved in SIMA development and processes.</li> </ul>
IR-82	C-NLOPB-22; WM-31	Section 15.3.3.3	Section 15.3.3.3 of the EIS provides a discussion on the oil spill tactical response methods to be implemented in the event of a spill. The Canada-Newfoundland and Labrador Offshore Petroleum Board has advised that the discussion of offshore containment and recovery is incomplete noting that there is no information on the quantity of oil that could be contained or recovered (i.e. percentage of spilled product that could be recovered) with this equipment.	With respect to the containment and recovery response method, provide a discussion of the percentage of spilled product that can be contained or recovered.

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IR-83	WM-11; NORPEN-07	Section 15.4.7.1	<p>Section 15.4.7.1 of the EIS states that the results of the stochastic model demonstrated the potential locations for spill effects to exceed threshold levels beyond the Regional Assessment Area boundary, and in some cases, beyond Canadian jurisdiction (i.e., Saint-Pierre and Miquelon - France, Greenland and the Azores). While it was stated that the average probabilities are low (less than 10 percent) and arrival times are greater than 50 days, a member of the public and an Indigenous group inquired about the response of other nations with respect to a spill, and consultation on the Project and the EIS.</p> <p>Additionally, Section 15.3.2 of the EIS indicates the local and federal government bodies that would be notified and engaged to support response efforts and provide oversight in the event of a spill. However, EL 1149 is outside the jurisdiction of the local and federal government agencies listed for emergency response and it is not clear in the EIS who would be notified and involved in response to an incident in EL 1149 if it were to occur.</p>	<p>Given the potential for spill effects beyond the Regional Assessment Area boundary, and beyond Canadian jurisdiction:</p> <ul style="list-style-type: none"> <li>describe the international obligations that would apply for incidents that may occur outside the exclusive economic zone (i.e., in Exploration Licence 1149) and implications for the Environmental Protection Plan, Safety Plan, Incident Management Plan, and Spill Response Plan;</li> <li>discuss if, and how, nations that may be impacted in the event of an accidental event have been consulted on the Project, and if these nations will be consulted on the development of the oil spill response plan;</li> <li>discuss the potential responses of other jurisdictions in the event that oil was released into international water; and</li> <li>confirm the organizations that would be notified and engaged in spill response if an incident were to occur in EL 1149.</li> </ul>
IR-84	FFAW-02; PNIN-04; KMKNO-39; WM-33	Section 15.2.2.1; Section 15.3; Section 15.5.1.3;	<p>In 2017 and 2018, the following three incidences were reported in offshore drilling operations in Atlantic Canada:</p> <ul style="list-style-type: none"> <li>on March 30, 2017, a near miss occurred when an iceberg closely approached the SeaRose floating production, storage and offloading facility in the White Rose Field;</li> <li>on June 22, 2018, a spill of synthetic-based mud occurred offshore Nova Scotia during the Scotian Basin Exploration Project; and</li> <li>on November 16, 2018, a spill of hydrocarbons occurred at the White Rose Field of Husky Energy.</li> </ul> <p>Section 15.3 of the EIS states that response management strategies are based on principles of preparedness, response and recovery and incorporate lessons learned from within the company and the wider industry.</p> <p>With respect to the Scotian Basin Exploration Drilling Project, the EIS states that the Proponent will use learnings from that incident to help prevent similar incidents from occurring on other current and future drilling programs and that information on the proponent's spill response, and monitoring activities during and after the event will contribute to the understanding of potential accidents and malfunctions. No specific information or examples were provided. The EIS does not discuss whether monitoring activities were undertaken after the Scotian Basin spill event and how monitoring results would be applied to this Project.</p>	<p>Describe the lessons learned from previous events in the Nova Scotia and Newfoundland and Labrador offshore and the methodologies that would be employed during this Project to ensure accidents and malfunctions similar to these are avoided.</p> <p>Discuss any monitoring activities undertaken following the synthetic-based mud spill on June 22, 2018 on the Scotian Basin Exploration Project offshore Nova Scotia to verify effects predictions (e.g., synthetic-based mud deposition on the seabed and effects to benthic habitat and species) and how the results of the monitoring activities may inform this Project.</p>
IR-85	ECCC-17	Section 15.3.2	<p>Section 15.3.2 of the EIS states that the proponent is a member of Oil Spill Response Limited (OSRL). Its subsea division (the Subsea Well Intervention Services) provides OSRL members with the opportunity to access subsea intervention capabilities, including subsea dispersant equipment, and capping and containment equipment. Although timeframes for the deployment</p>	<p>Provide timelines associated with the deployment time for subsea dispersant equipment following an accidental event.</p> <p>Provide information on the timelines for individual steps within the deployment process including timelines associated with deployment from the warehouse to the</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>of capping stacks have been provided, none are provided for the deployment of subsea dispersant equipment.</p> <p>It is important to understand the response measure timeframes involved with the deployment of all subsea incident response apparatus so that well control preparation activities and associated timeframes can be fully appreciated and the magnitude of environmental effects resulting from any extended timelines can be properly determined and characterized to the greatest extent possible in order to help inform a determination of significance of any residual effects.</p>	<p>ship, transit time to St. John's and to the site, and confirm if the equipment can be used on site immediately upon arrival.</p>
IR-86	ECCC-16	Section 15.3.3.1; Section 15.3.3.2	<p>Sections 15.3.3.1 and 15.3.3.2 of the EIS provide information on the timelines involved with the mobilization and installation of a capping stack, following the loss of well control. However, no information has been provided on the expected operational lifespan, the timing of decommissioning, or on any follow-up monitoring activities that would be required after a capping stack has been removed from a wellhead.</p> <p>It is important to understand the lifespan and decommissioning implications for wells that may become compromised due to blowout events so as to better understand and characterize any longer-term environmental effects that may occur, and may therefore need to be monitored, at blowout-affected well sites.</p>	<p>Provide information on the operational lifespan of proposed capping stacks and any contingencies in place to either extend their service or to replace them.</p> <p>Provide information on when a capping stack system may be decommissioned and describe any potential wellhead integrity monitoring efforts that would follow, including expected timeframes of such.</p>
IR-87	C-NLOPB-21	Section 15.3.3.2	<p>If a blowout incident were to occur, Section 15.3.3.2 of the EIS states that one option is to commence the mobilization of the air-freightable capping stack from Stavanger, Norway to the St. John's International Airport using an Antonov AN-124 aircraft.</p> <p>The Canada-Newfoundland Offshore Petroleum Board has advised that a review of St. John's International Airport <a href="#">published infrastructure</a> statistics indicates a primary runway length of 2600 metres. However, the runway length requirement for an Antonov 124, according to <a href="#">Air Charter Service</a>, are 3000 metres.</p> <p>Based on the runway availability and requirements it is not apparent that the deployment and use of the air freightable capping stack is feasible.</p>	<p>Discuss the feasibility of air freight potential for a capping stack being transported to the St. John's International Airport. If runway length at the St. John's International is not sufficient, discuss alternate locations to which the capping stack could be transported. If alternate airports are identified, confirm that the timeline for the capping stack to reach the site is unchanged.</p>
<b>Effects of the Environment on the Project</b>				
IR-88	WM-57	Section 16.1.2	<p>On November 16, 2018, the Husky Energy SeaRose production platform experienced a loss of pressure from the subsea flowline while preparing to restart production. At the time of restarting, waves were recorded at 8.4 metres.</p> <p>Section 16.2 of the EIS states that implementing operating limits and stop-work procedures in the event of unsafe conditions will reduce the potential of occurrence and magnitude of effects of the environment on the Project. However, no details pertaining to parameters for extreme weather conditions under which Project activities would be modified, suspended or delayed are provided.</p>	<p>Discuss parameters for extreme weather conditions for which Project activities would be modified, suspended or delayed.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
IR-89	C-NLOPB-16, -23	Section 16.2	Section 16.2 of the EIS provides mitigation measures specific to oceanographic conditions, sea ice, icebergs and superstructure icing, and geological stability and seismicity; however, it does not include a discussion of moving the MODU to safe waters when sea ice or iceberg conditions threaten the safety of the MODU. The C-NLOPB advised this is the primary tool for managing harsh ice conditions (sea ice or iceberg presence) in the offshore of Newfoundland.	Update the discussion on sea ice/iceberg mitigation strategies to include the transiting of the MODU to a safe location.
IR-90	MTI-16	Section 15.3.3.3	<p>Section 15.3.3.3 of the EIS provides an overview of tactical response methods to oil spills, in the event of an emergency, including the use of containment and recovery equipment, dispersants and surveillance and tracking measures. The proponent recognizes that the effectiveness of some of the methods will be affected by specific environmental conditions (e.g. wave height and visibility) and that it is possible that some of the options may not be feasible at the time of the spill.</p> <p>While the EIS states that a description of how different tactics will be selected for different scenarios and locations will be discussed in the Spill Response Plan, there is no discussion in the EIS related to the limitations of the spill response equipment, in particular with regards to weather conditions in the North Atlantic. For example, the efficacy of booms and skimmers and in-situ burning are limited to favourable water conditions, and surveillance and tracking of spills also has limitations of efficacy due to sea state and weather conditions.</p>	Based on the historical metocean and weather data offshore Newfoundland and Labrador, discuss the effective limitations of proposed tactical response measures, including an estimate of the expected number of days and month periods when such weather conditions persist to accommodate such equipment. In addition, discuss how conditions may impact the effectiveness of monitoring and surveillance programs.
IR-91	C-NLOPB-17	Section 16.1.3	Section 16.1.3 of the EIS discusses the probabilities of a major earthquake, as well as a minor and major landslide in the Eastern Canadian offshore. However, Section 6.6.2 of the EIS Guidelines require a discussion of the different probability patterns (e.g., 5-year event versus 100-year events) for environmental factors, which is not included in the EIS.	Describe the probability patterns (e.g., 5-year versus 100-year events) for environmental factors such as seismic events and submarine landslide potential.
<b>Cumulative Effects</b>				
IR-92	C-NLOPB-18	Section 14.4.4.2	<p>Section 14.4.4.2 of the EIS states that “potential water quality and sound effects from the Project and other third-party physical activities may temporarily reduce habitat availability within the RAA... Although this cumulative change in habitat quality and use has potential to disrupt reproductive, foraging and feeding, and/or migratory behaviour of marine mammals and sea turtles if the availability of important habitat areas, including designated special areas, is affected, the likelihood of this cumulative interaction is considered low given the distances over which Project and non-Project activities are taking place, as well as the localized nature of potential residual Project effects.” No further information is provided to support the statement that effects would be localized. Underwater sound can travel hundreds of kilometres.</p> <p>Consideration should be given to how mapping could be used to illustrate the potential for overlapping cumulative effects on valued components as a result of several projects exerting discrete areas of influence simultaneously.</p>	<p>Update the assessment of potential cumulative environmental effects on marine mammals using appropriate methodology (e.g. mapping, quantification and/or otherwise) taking into account:</p> <ul style="list-style-type: none"> <li>the spatial extent of effects from activities (e.g. noise on whales) and associated cumulative effects of creating multiple zones of avoidance in the Project Area;</li> <li>the spatial range of populations of species, recognizing that effects on individuals from the same population in different areas would result in cumulative effects to the species; and</li> <li>that species would be affected by multiple activities (e.g. noise from drilling units, production facilities and seismic operations, as well as vessel interactions).</li> </ul> <p>Include consideration of various underwater noise sources occurring at the same time (e.g. multiple exploration units operating simultaneously, exploration drilling occurring at the same time as geophysical activities, marine shipping etc.) and associated</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>The Agency’s Technical Guidance document on Assessing Cumulative Effects under CEAA 2012 (April 2017 draft) identifies methodological options for analysis of cumulative effects, including quantitative models and spatial analysis.</p>	<p>cumulative effects on marine mammals, including how and where thresholds for behavioral modifications or injury may be exceeded. Consider the potential accessibility of unaffected corridors between areas of influence on marine mammals and provide figures to illustrate potential projects/activities and associated zones of influence (e.g. range of effects) to which they could be exposed.</p> <p>Discuss the need for mitigation and monitoring or follow-up, and update predictions regarding the significance of effects accordingly.</p>
IR-93	FFAW-04	Section 13.1.2	<p>Section 13.1.2 of the EIS states that “[t]here have been concerns among stakeholders that the combination of fisheries closure areas along with safety zones from oil and gas activities can potentially contribute to cumulative effects on fishing. ”Fish Food and Allies Workers-Unifor has raised concerns regarding commercial fishers needing to avoid safety zones and areas with increased vessel traffic.</p> <p>Section 14.7.1 of the EIS (which includes reference to section 14.6.4) provides a cumulative environmental effects assessment of commercial fisheries and other ocean users, which states that the 500 metre safety zone that will exclude harvesting activities will be localized within an area of approximately 0.8 square kilometres for up to 60 days for each of the wells and that the safety zones associated with other exploration and production drilling projects will increase the cumulative area that will be temporarily unavailable. No further information is provided, including whether the potential for multiple wells to be drilled concurrently on this project was considered in the assessment. The concerns raised by stakeholders, as indicated above in Section 13.1.2 and by FFAW, are not addressed directly.</p> <p>A figure illustrating the safety zones from the proposed 20 exploration wells for this project could be used to demonstrate the area restricted to ocean users by project safety zones. A figure illustrating safety zones for all existing and proposed production and exploration wells located in the Regional Assessment Area would demonstrate the cumulative environmental effects of safety zones from multiple projects.</p> <p>The area of safety zones closed to other ocean users could be calculated and compared with the fishing areas in the Regional Assessment Area.</p>	<p>Describe the potential for overlapping safety zones as a result of concurrent well drilling from this project. Include a figure as applicable.</p> <p>Discuss the cumulative area lost to harvesting from production and exploration well drilling in the Regional Assessment Area and any potential mitigation measures. Include a figure and area calculations as applicable.</p>
IR-94	PNN-21	Section 14.2.2; Section 14.2.4.1	<p>Section 14.2.6 of the EIS concludes that the residual cumulative environmental effects on fish and fish habitat are predicted to be not significant and that the conclusion has been determined with a moderate to high level of confidence based on an understanding of the general environmental effects of exploration drilling and vertical seismic profiling operation, as well as the effectiveness of standard mitigation measures. However, little analysis has been provided to support this statement.</p>	<p>Provide an updated analysis to support the conclusion that the residual cumulative environmental effects on fish and fish habitat are predicted to be not significant and that the conclusion has been determined with a moderate to high level of confidence.</p>

IR Number	External Reviewer ID	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
			<p>Première Nation des Innus de Nutashkuan expressed concern related to the cumulative effects of the Project on fish and fish habitat, in particular the cumulative effects associated with an increase of oil and gas production activities.</p>	
IR-95	ECCC-11	Section 14.3.4; Section 14.3.4.1	<p>Environment and Climate Change Canada has advised that in addition to migratory birds being attracted to offshore exploration and production facilities, the cumulative effects of artificial light have created a significant footprint<sup>1</sup> in the offshore which did not exist a few decades ago. The deterioration of the physical offshore environment due to light pollution needs to be considered beyond the immediate vicinity of each individual installation. The addition of the Project's exploration drilling MODUs would contribute to the overall footprint of projects in the Newfoundland and Labrador offshore that produce artificial light that attract migratory birds. More specifically, the cumulative impact of multiple artificial light footprints in a previously pristine environment needs to be taken into account, particularly with respect to how this may be altering the behaviour of nocturnal species (e.g. millions of Leach's Storm-petrels that regularly forage in and migrate through the area).</p> <p><u>Reference</u></p> <p><sup>1</sup>Cizano, P., Falchi, F., and Elvidge, C.D. (2001). The first World Atlas of the artificial night sky brightness. Monthly Notices of the Royal Astronomical Society. 328(3): 689-707.</p>	<p>Review the information provided by Environment and Climate Change Canada related to cumulative effects of artificial light, and update the assessment of potential cumulative environmental effects on migratory birds with how the presence of the new MODUs and other support vessels in the Project Area would contribute to the overall amount of artificial light currently present in the offshore and how this increase could impact migratory birds.</p> <p>Identify mitigation measures and monitoring or follow-up if needed, and update predictions regarding the significance of effects accordingly.</p>
IR-96	WM-69	Section 14.5.2	<p>Section 14.3.6 of the EIS states that "with the application of proposed Project-related mitigation and environmental protection measures, the residual cumulative effects on marine and migratory birds (including SAR [Species at Risk]) are predicted to be not significant. Therefore, no additional mitigation measures beyond those in place to mitigate the Project's direct effects are needed to address potential cumulative effects." Evidence regarding the effectiveness of mitigation measures related to direct project effects has not been provided.</p>	<p>Provide a rationale supporting no need for additional mitigation measures for cumulative effects other than those planned to mitigate the Project's direct effects, or identify a broader range of potential mitigation measures to address potential cumulative effects on birds.</p>

**Required Clarifications**

Clarification Number	External Reviewer ID	Reference to EIS	Context and Rationale	Required Clarification
<b>Project Description</b>				
CL-01	C-NLOPB-02, -03, -04	Section 1.5.1; Section 1.5.3	<p>Table 1.2 of the EIS (Summary of Key Relevant Offshore Legislation and Guidelines) lists relevant regulations and guidelines that fall under the jurisdiction of the C-NLOPB. However, the list is incomplete as it does not contain the Safety Plan Guidelines.</p> <p>Similarly, Table 1.3 of the EIS references statutes that are not applied in C-NLOPB jurisdiction. Although the “Regulations Establishing a List of Spill-treating Agents SOR/2016-108” are made under <i>Canada Oil and Gas Operations Act</i>, the use of the those regulations in C-NLOPB jurisdiction is described under the <i>Accord Acts</i> and the “<i>Energy Safety and Security Act</i> (S.C. 2015, c. 4)” also is described under the <i>Accord Acts</i>.</p>	<p>Revise Table 1.2 to refer to all regulations and guidelines relevant to the Project environmental assessment, including but not limited to:</p> <ul style="list-style-type: none"> <li>• Safety Plan Guidelines; and</li> <li>• Revise Table 1.3 to remove legislation which does not apply in offshore of Newfoundland or describe the applicability of <i>Canada Oil and Gas Operations Act</i> and the <i>Energy Safety and Security Act</i> to this Project.</li> </ul>
<b>Physical Environment</b>				
CL-02	ECCC-23	Section 5.3.1	Section 5.3.1.2 states, “Wave heights and periods in the MSC50 database are computed using a Pierson Moskowitz spectrum.” Environment and Climate Change Canada advises that this is an insufficient (and possibly misleading) description of how waves in the data set are generated.	Describe the wind fields and wave model used in the preparation of the MSC50 data set.
CL-03	ECCC-22; KMKNO-09	Section 5.3.1.1	The proponent provides a description of the International Comprehensive Ocean-Atmosphere Data Set (ICOADS) used in the analysis of the marine climatology for the Project Area. However, no information was provided as to the location or number of data points included for the eastern and western sections of the Orphan Basin. Environment and Climate Change Canada advised that a discussion of the limitations of the analysis is required.	Provide the number of observations used in the data analysis for both the eastern and western sections of the Orphan Basin and discuss the limitations of the analysis. Provide a figure illustrating the location of the ICOADS data points in the Project Area.
<b>Air Quality</b>				
CL-04	ECCC-03	Section 5.5; Section 5.5.1.3, Figure 5.56	<p>Section 5.5 of the EIS describes the ice conditions. Figure 5.56 of the EIS is labeled “Median Concentration of Sea Ice in the Project Area for the Week of March 12 (1981-2010)”; however, Environment and Climate Change Canada advises that it is actually the median of predominant ice type when ice is present.</p> <p>Given that this figure is mislabeled it is unclear whether the associated data presented in Section 5.5.1.3 is median concentration of sea ice, or median of predominant ice type when ice is present.</p>	Provide a corrected Figure 5.56 and confirm whether data in Section 5.5.1.3 is in fact for median concentration of sea ice. If not, provide an updated discussion of sea ice to clarify this discrepancy.
<b>Fish and Fish Habitat / Marine Mammals and Sea Turtles</b>				
CL-05		Section 8.1.3	Table 8.1, in Section 8.1.3 of the EIS, presents the potential environmental effects, pathways, and measurable parameters related to the potential environmental effects of the Project on marine fish and fish habitat. With respect to change in risk of mortality or physical injury, the measurable parameter relates only to mortality, there is no measure identified or discussed related to fish injury.	Provide clarification the measurable parameters related to fish injury as considered in the risk analysis of the potential environmental effect of the project on marine fish and fish habitat.

Clarification Number	External Reviewer ID	Reference to EIS	Context and Rationale	Required Clarification
CL-06	DFO-CL-30	Section 6.0	<p>Table 6.4 of the EIS which identified the key fish species from the 2016-2017 Canadian research vessel survey sets within the Regional Assessment Area and the Project Area. However, Figure 7.18 of the EIS indicates that there has been domestic harvesting of Shrimp within the Regional Assessment Area and the Project Area.</p> <p>Fisheries and Oceans Canada requested clarification on whether the absence of Shrimp was due to low prevalence in the study area, or a result of the use of only 2016 data.</p>	Confirm if the absence of Shrimp as a listed key species in the Project Area and Regional Assessment Area is a result the data or due to stock status of the species.
CL-07	DFO-CL-32	Section 6.0; Section 6.1, Table 6.1; Section 6.1.7	<p>Fisheries and Oceans Canada noted that in Section 6.0, the term “abundance” was frequently used when discussing weights. Likewise, in Section 6.1, the distinction between Relative Abundance (%) and Average Occurrence (%) is unclear. Fisheries and Oceans Canada advised that in fisheries stock assessment terminology “abundance” is generally employed when discussing numbers of fish with respect to numbers per tow. As such, the use of abundance in this context is somewhat confusing and should be replaced with “biomass” terminology.</p> <p>For example, Section 6.1.7 (page 6.19), states “The results of the RV survey indicate Deepwater Redfish, Greenland Halibut, Roughhead Grenadier, scyphozoan (marine jellyfish), Roundnose Grenadier, Witch Flounder and Northern Wolffish make up 91% of the catch by weight, with redfish contributing 41% of the abundance by weight. Distribution of the six most abundant fish species in the Project Area are shown in Figures 6.6 to 6.11.” Terminology is confusing as 7 species are listed as making up 91% of the catch by weight while redfish are listed as contributing 41% of the abundance by weight.</p>	Define what abundance represents, and clarify if the distribution of the six most “abundant” fish species in the area based upon weight or numbers.
CL-08	DFO-CL-40	Section 8.3.3	<p>Section 8.3.3. of the EIS states “The lack of bioaccumulation and low toxicity of cuttings substances indicates that direct toxicity of water-based (drilling) mud (WBM) or synthetic-based (drilling) mud (SBM) to benthic fauna is unlikely (IOGP 2016). However, it is difficult to distinguish between cuttings toxicity and the indirect effects on benthic communities caused by sediment alteration and organic enrichment (IOGP 2016).”</p> <p>Fisheries and Oceans Canada stated that these statements are conflicting; the first sentence indicates that direct toxicity of WBM or SBM to benthic fauna is unlikely, whereas the second sentence indicates that it is difficult to distinguish between cuttings toxicity (which the previous sentence indicated is unlikely) and the indirect effects caused by sediment alteration and organic enrichment.</p> <p>Further, it could also be argued that sediment alteration and organic enrichment are direct (not indirect) effects upon benthic fauna.</p> <p>As such, clarification is required on the toxicity of WBM and SBM on benthic fauna.</p>	Provide clarification on the direct and indirect effects of SBM and WBM on benthic fauna.
CL-09	DFO-CL-02	Section 2.8.5.5	Table 2.16 in Section 2.8.5.5 of the EIS does not provide units for the 95 percent Horizontal Distance.	Provide the units used for 95 percent Horizontal Distance.

Clarification Number	External Reviewer ID	Reference to EIS	Context and Rationale	Required Clarification
CL-10	DFO-CL-20	Section 10.3.3.1	Section 10.3.3.1 of the EIS states that “they propose thresholds of 210 dB SELcum and 207 dBpeak, which are consistent with those proposed for fish species whose swim bladder is not involved with hearing. Sound levels from vertical seismic profiling operations are predicted to be below these levels at distances beyond a couple of hundred metres (Matthews et al. 2017).” The reference to VSP levels being below 210 dB SELcum and 207 dB peak within a couple hundred metres cannot be found in Matthews et al., 2017.	Provide the reference for vertical seismic profiling levels being below 210 dB SELcum and 207 dB peak beyond a couple hundred metres.
CL-11	DFO-CL-21	Section 10.3.3.1	Section 10.3.3.1 of the EIS makes reference to “...sound level isopleths..” It is not clear what a sound level isopleth is.	Define a “sound level isopleth” as it relates to section 10.3.3.1 of the EIS.
CL-12	DFO-CL-22	Section 10.3.3.1	Section 10.3.3.1 of the EIS states that “modelling results suggest that if a baleen whale occurs within approximately 5-6 kilometre of the vertical seismic profile air gun array... for a 24-hour period (i.e., the full duration of the VSP survey) there is risk of auditory injury (PTS).” The EIS also references BOEM 2017 to indicate that “...most predicted incidents of auditory injury would occur at greater distances from the source.” It is not clear as to how far from the source would be considered to be a “greater distance” and how this would relate to the 5 to 6 kilometre value provided above.	Describe how far from the source a “greater distance” would be from the source of sound and how this would relate to the 5 to 6 kilometre value.
CL-13	DFO-09	Section 10.3.3.1	Section 10.3.3.1 of the EIS states that “...repeated, or (in some cases) single exposures to a level well above that causing TTS [temporary threshold shift] onset, might elicit PTS [permanent threshold shift]...” And “United States National Marine Fisheries Service guidelines provide the most current guidance on threshold levels of underwater sound for the onset of TTS and PTS in marine mammals.” The levels to elicit PTS are provided in Table 10.4 of the EIS; however, the levels for temporary threshold shift onset are not provided.	Provide the threshold levels for onset of temporary threshold shift for auditory injury.
<b>Migratory Birds</b>				
CL-14		Section 9.3.3.1	Section 9.3.3.1 of the EIS states that “To mitigate potential effects from vertical seismic profiling activities, air gun operations will incorporate a ramp-up...to provide an opportunity from diving marine birds to move away”. However, later on in the same paragraph it states that above the water, atmospheric sounds from the air gun array is substantially reduced.  It is unclear how the ramp-up would provide mitigation for diving birds as prior to the dive they would be in the air and therefore not hearing the ramp-up.	Provide clarification as to how a ramp-up procedure mitigates the effects of noise on marine birds.
CL-15		Section 14.3.4.2	Section 14.3.4.2 of the EIS states that helicopters will fly a lateral distance of 2 kilometres over active colonies when possible.	Clarify the circumstances under which it would not be possible for helicopters to remain at least 2 kilometres from bird colonies.
<b>Species at Risk</b>				
CL-16	DFO-06;	Section 6.1.8, Table 6.6;	Table 6.6 in Section 6.1.8 of the EIS states there are two species at risk that have a high/moderate potential to occur in the Project Area: Northern Wolffish and Spotted Wolffish. Critical habitat	Provide a high resolution map that shows the proposed critical habitat for Northern and Spotted Wolffish and any overlap with Exploration Licences.

Clarification Number	External Reviewer ID	Reference to EIS	Context and Rationale	Required Clarification
		Section 8.3.4; Section 8.3.5	proposed by Fisheries and Oceans Canada for Northern and Spotted Wolffish is comprised of several discontinuous critical habitat areas. The EIS states that cumulatively, the critical habitat for both species is approximately 655.80 square kilometres and partially overlaps with the Project Area however, the EIS does not provide a figure showing the location of the proposed critical habitat in relation to the Project Area and Exploration Licences.	
<b>Indigenous Use</b>				
CL-17	DFO-CL-17	Section 7.4.2, Table 7.15	<p>Fisheries and Oceans Canada noted the following errors in Table 7.15 in Section 7.4.2 of the EIS:</p> <p>Innu Nation holds several food, social and ceremonial (FSC) licences for Sheshatshiu and Natuashish for salmon, Arctic char, and trout. This sentence should read: Innu Nation holds two FSC licences one for Sheshatshiu and one for Natuashish covering salmon, Arctic char, and trout.</p> <p>NCC holds several FSC licences including for salmon, trout, Arctic char, Atlantic cod, rock cod, herring, scallop, whelk, smelt and seal. This sentence should read: The NCC holds two FSC licences for species such as salmon, trout, Arctic char, Atlantic cod, rock cod, herring, scallop, whelk, smelt and seal.</p> <p>no information is available for FSC licences for the Qalipu Mi'kmaq First Nation. This sentence should read: Qalipu Mi'kmaq First Nation does not hold a FSC licence.</p> <p>Miawpukek First Nation (MFN) holds several FSC licences for scallop, lobster, mackerel, herring, rainbow trout, brook trout, cod, eels, smelt, capelin, seals (harp, grey, and harbor), snow crab, whelk, and redfish. This sentence should read: The MFN holds one FSC licence for the following species: scallop, lobster, mackerel, herring, rainbow trout, brook trout, cod, eels, smelt, capelin, seals (harp, grey, and harbor), snow crab, whelk, and redfish.</p>	Revise Table 7.15 to clarify the number of licences held by the Innu Nation, NCC, Qalipu and MFN.
CL-18	DFO-CL-18	Section 6.1.9	Section 6.1.9 of the EIS states "All of these Atlantic Salmon populations, except the Inner Bay of Fundy population, have the potential to occur in the Project Area". It cannot be said with certainty that the Inner Bay of Fundy population will not occur in the Project Area.	Clarify the uncertainty related to the occurrence of the Inner Bay of Fundy population of salmon in the Project Area.
<b>Commercial Fisheries</b>				
CL-19		Section 7.2.7.1	<p>Section 7.2.7.1 of the EIS indicates that in terms of international harvesting, the Northern Shrimp fishery in NAFO Unit Areas 3MLNO is subject to a moratorium. This would exclude northern shrimp harvest in a portion of the Project Area that overlaps NAFO Unit Area 3MLNO.</p> <p>However, as illustrated in Figure 13.1 of the EIS, a portion of the Project Area, and portion of Exploration Licence 1149 is in NAFO Unit Area 3K, which is not subject to a moratorium. In addition, Table 7.7 of the EIS indicates that Northern Shrimp were harvested in 3K between 2012 and 2017. However, it is not clear of the harvest in those years is a result of the domestic fishery within the exclusive economic zone (illustrated in Figure 7.19), or if a portion of the harvest was fished outside the exclusive economic zone.</p>	Confirm if there has been a targeted Northern Shrimp fishery conducted by international harvesters in NAFO Unit Area 3K outside the Canadian exclusive economic zone that overlap with the project area. If there has been harvest by international fleets of Northern Shrimp in the project area outside the exclusive economic zone, confirm if there has been harvest of Northern Shrimp in Exploration Licence 1149. Update the effects assessment, if required.

Clarification Number	External Reviewer ID	Reference to EIS	Context and Rationale	Required Clarification
CL-20	DFO-CL-12	Section 7.2.3	Section 6.1.9.2 of the EIS Guidelines require the proponent to describe current and historical use of waters, including commercial fisheries activities. Fisheries and Oceans Canada noted that the data provided in Section 7.2.3, Table 7.2 and 7.3 and Figure 7.2, 7.3, and 7.4 indicates that the catch in the Project Area includes data from NAFO 3Ld rather than NAFO Unit Area 3Le as would be expected for the location of this Project.	Confirm if the data presented in Section 7.2.3, Table 7.2 and 7.3 and Figure 7.2, 7.3, and 7.4 include data from NAFO 3Ld rather than NAFO Unit Area 3Le. If data from NAFO Unit Area 3Le has not been included, revise the related figures and tables to present the information on the harvest from the correct NAFO Unit Areas that overlap with the Project Area.
<b>Accidents and Malfunctions</b>				
CL-21	DFO-CL-26	Section 15.4.7.1	Section 15.4.7.1 of the EIS includes the statement “In addition, the plume trap height occurs at much greater water depth than for the East Orphan well blowout scenarios, therefore the oil is dispersed and diluted more readily to concentrations below the threshold level, reducing the footprint.”  Fisheries and Oceans Canada advised that the statement needs clarification, as the West Orphan Basin site is shallower (1360 metres) than the East Orphan Basin site (2785 metres).  Additionally, the statement referenced from Section 15.4.7.1 does not align with information presented in Section 1 of Appendix D, which states the following:  “... occurs at much greater water depth for the East Orphan well blowout scenarios...” Clarification related to the plume trap height at each blowout scenario is required.	Provide clarification on the depths of the plume height termination for overboard discharges and for each well blowout scenario, in relation to each other, confirming if the statement in Section 15.4.7.1 should read “... occurs at much greater water depth for the East Orphan well blowout scenarios...”.
CL-22		Section 15.4.6.	Section 15.4.6 (Table 15.9) of the EIS presents the defined thresholds used in spill modelling. It is stated that, “Work undertaken by Neilson proposed a value for acute exposure to dispersed oil of 58 ppb, based on the toxicity of chemically dispersed oil to various aquatic species, which showed the 5% effect level is 58 ppb”. It is unclear what the 5 percent effect level is and what it represents for this project.	Provide an explanation on what the 5 percent effect level represents and how that applies to the current project.
CL-23		Section 15.4	Throughout Section 15.4 of the EIS spill information with respect to volume and release rate presented in petroleum barrels only. As there are two petroleum barrel measures, metric and imperial, clarification on the unit is required.	Confirm if the reference to barrels is based on an imperial or metric measure.
<b>Effects of the Environment on the Project</b>				
CL-24		Section 16.2	Table 16.8 in Section 16.2 states “MODU will have the capability to disconnect the riser from the well in a short period of time, to reduce the risk of damage to the well, riser, and MODU.” However, “a short period of time” is not defined.	Define “a short period of time” with respect to disconnecting the riser from the well.