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Review of Newfoundland Orphan Basin Exploration Drilling Project

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Preamble

With advent of deep-water exploration in the Orphan Basin (and Flemish Cap), offshore oil drilling and production in Canadian waters has moved into a new realm of development. Hence, new regulatory precautions are essential. The old ones are hard to find. For example, the Atlantic Accord allows companies to not report accidental spills and environmental pollution during exploration activity to Environment Canada and Climate Change. Given that the Canadian ocean is a shared resource and natural service provider for fishers and for all citizens, it is difficult to understand how this exemption could have possibly been legislated as it only benefits oil corporations that are liable for ocean pollution. The lack of transparency by all oil companies is shocking, but not as much as the refusal of the regulator – the C-NLOPB to share information about the projects it oversees. Not doing so precludes independent research about best and less environmental invasive practices for the industry (Fraser et al. 2008; Fraser & Ellis 2009).

The largest oil pollution event in US history occurred following the *Deepwater Horizon* blowout at a deep-water well in the Gulf of Mexico in 2012. At that time, the US attributed a major part of the problem for the engineering errors, which allowed oil to flow into the Gulf for months, to the close relationship between the regulator and the industry. Consequently, the responsibilities for development were separated from those for safety and the environment. **Appendix 5 of the British Petroleum EIS regarding lessons learned from the blowout in the Gulf of Mexico unsurprisingly but also unjustifiably ignores this major US counter-action.** Though the deep-water wells that to be drilled in the Orphan Basin in the open North Atlantic Ocean will two and three times deeper than those at the *DeepWater Horizon* site in the more benign Gulf of Mexico, and though there have been similar calls for such a partitioning of responsibility in Canada, they have gained no effective legislative traction.

Current debate raises concerns about the times estimated for the capping of a well in the event of a deep-water blowout. It took 87 days to accomplish this in the Gulf of Mexico blowout, though much shorter times presented in Orphan Basin (and Flemish Cap) EIS.

Concerns are also raised about not having a capping stack available in Canada to reduce response time (https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-oil-blowout-newfoundland-1.4920844). These very basic regulatory precautions are necessary to help ensure environmental sound operation.

Given that ocean climate change is in great flux and the frequency of extreme storms are increasing, it is inappropriate to seek of permit approvals for longer than three years. The requested 9-year waiver inappropriately flies in the face of precautionary rationale and sets a volatile and very risky precedent. Climate, animal distributions and marine technology is expected to change drastically over the next decade, so granting a nine permit would permitting new activities using untested open ocean deep-water production in unforeseen circumstances. This is the antithesis of precautionary approach that could instill public confidence and help ensure full protection of the North Atlantic Ocean ecosystem. Acceptance of such a way forward is acceptance of irresponsibility and of unnecessary future catastrophes.

Review of Newfoundland Orphan Basin Exploration Drilling, Program Environmental Impact Statement Summary

Comment Number	Reference to EIS (Section and page)	Context and Rationale	Specific Question/ Request for Information
e.g. #1	*Identify which section(s) of the EIS, EIS Summary or appendices are related to the comment (Volume, section, page number).* *e.g. page 78, section 6.6.1 fish and fish habitat*	*Provide applicable background or rationale for requesting the information and why it is important for understanding the effects of the Project or for developing a follow-up program to verify the accuracy of EA predictions or the effectiveness of mitigation measures* *e.g. Although the potential effects to fish species during the operation of the Project have been adequately described, the potential long-term effects to fish species during and following well abandonment is not clear.*	*Ask a specific question, or request specific additional information or clarification.* *e.g. Describe the long-term effects to fish and fish habitat during and after well abandonment. Consider how fish use of the area might change, as well as potential contamination of fish. Update any associated conclusions accordingly.*
1	2.3.1.2 Drilling Pg 5, 4th paragraph	During riserless drilling, water-based mud (WBM) is typically used as the drilling fluid and cuttings are discharged directly to the marine environment in accordance with regulatory guidelines.	This could affect and change species/species habitats in the area. What are the regulatory guidelines for this?

2	Pg 7, 1st sentence	As waste disposal promotes artificial reefing and attracts fishes, more information is needed.	Specify which wastes will be directly disposed into the ocean and which will be brought to shore.
3	2.3.1.2 Drilling Pg 7, 1st paragraph	During drilling activities, where technically feasible, lower toxicity drilling muds and biodegradable and environmentally friendly additives within muds and cements will be preferentially used.	Environmentally friendly products will be used 'where technically feasible.' Specify when these products cannot be used. Specify the harmful chemicals that will be used. Detail how can they affect marine life?
4	Pg 12, Figure 2.3	Hose disconnects between platforms and tankers have caused spills in the Newfoundland offshore. Those that occurred at night were not detected until after several hours when slicks were observed on the water during daylight.	Specify mitigation measures to be undertaken to prevent hose disconnects. Specify 1) nocturnal vs daytime measures, and 2) measures during rough seas , 3) sea state cutoffs for oil transfers from platforms to tankers..
5	2.4.3 Contingency Planning and Emergency Response Pg 13, 3rd paragraph	A blowout is a major environmental concern; more details about capping estimates are needed. If a blowout incident were to occur, it is estimated the well could be capped between 9 and 17 days after an incident (based on median value of timing estimates).	Given that the wells will be deeper and in rougher seas than the *Deepwater Horizon* site and that the blowout there required 87 days to cap, how can the 9 – 17 days estimates be scientifically credible? Provide basis for 9 – 17 day estimates for capping.
6	2.4.3 Contingency Planning and Emergency Response Pg 13, 3rd paragraph	If a relief well is required to stop the flow of hydrocarbons, for the purpose of this environmental assessment and associated spill modelling, it is conservatively estimated that the mobilization and drilling of a relief well could take approximately 120 days. However, the actual time to plan and execute a relief well would be considerably less.	This is unclear, drilling of a relief well could take up to 120 days but actual time will be considerably less? Provide evidence to support this statement.
7	2.4.4 Fate and Behaviour of Potential Spills Pg 14, 4th paragraph	Simulations of spill trajectories are important environmental concerns, so more interrogation and integration of options is needed.	Provide information on the reliability [confidence intervals] of spill trajectory analyses. How well did previous analysis predict the trajectory of the Terra Nova slick in 2004? Give details.
8	2.4.4 Fate and Behaviour of Potential Spills Pg 14, 4th paragraph	Simulations of spill trajectories are important environmental concerns, so more interrogation and integration of options is needed with respect to seabird distributions on the Grand Bank.	Run simulations of spill trajectories in each season with ECAS seabird distributions. Specify when highest risk is expected.
9	2.4.4.1 Well Blowout Scenario	The west to northwesterly winds and higher frequency and strength of surface currents	The biggest concern is not oil reaching coastlines, it is the environmental damage it causes to marine

	Pg 15, 1st paragraph	towards the south and south southeast during the winter months transports the oil further south during the winter season, whereas the predominant southwesterly winds transport the oil away from the Avalon coastline in the summer months.	life Seabirds spend most of their lives at sea. How is this expected to affect marine birds, mammals, fish and plankton?
10	2.4.4.1 Well Blowout Scenario Pg 15, 2nd paragraph	As a result of the deep well locations, oil would travel further in the water column and is dispersed more widely before surfacing (https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-oil-blowout-newfoundland-1.4920844)	Provide specific information regarding oil that would widely dispersed in the water column before reaching the surface. Give estimates of proportions of released oil that could reach the surface from different depths.
11	2.4.4.1 Well Blowout Scenario Pg 15, 4th paragraph	The stochastic results also demonstrated the potential locations for spill effects exceeding threshold levels beyond the RAA boundary, and in some cases, beyond Canadian jurisdiction (Saint-Pierre and Miquelon - France, Greenland and the Azores). However, average probabilities are low (<10%) and arrival times are greater than 50 days.	<10% on other jurisdictions is still greater than affect it may have on Canadian jurisdiction. Address potential responses of other jurisdictions and of oil released into international waters.
12	2.4.4.1 Well Blowout Scenario Pg 15, 5th paragraph	34% in the water column; with that remaining in the water column dispersed to negligible concentrations (<58 ppb THC dispersed oil).	Oil released in water column to negligible concentrations could still be ingested by marine life, and possibility bioaccumulate. Specify negligible on what basis?
13	2.4.4.2 Diesel Spill Scenario Pg 16, 5th paragraph	RPS (2017) indicates that the release would be predicted to result in patchy and discontinuous surface sheens, although the large release volume would likely result in a rainbow sheen for approximately 40 km before transitioning to a colourless and silver sheen.	Explicitly acknowledge and reference O'Hare and Morandin (2010) indicating that sheens can disrupt the waterproofing integrity of seabird plumage.
14	2.4.4.3 SBM Spill Scenario Pg 17, 1st paragraph	Deep-water wells are riskier ventures than shallow water ones.	Provide justification for spill modeling using well sites of 1,360 m [West Orphan Basin] and of 1,137 m [Nexen Energy] well sites, when it is indicated [pg. 4] that depths of up to 3,000 m are under consideration. Provide spill modeling for deepest well possible.

15	Table 3.1 Summary of Alternative Analysis Pg 19	Brilliant white lighting and flaring are the major sources of seabird attraction to and mortality at offshore rigs and platforms. Mitigation is essential [Montevecchi 2006; Burke et al. 2014; Montevecchi et al. 2018].	It is inaccurate to claim that spectral modified lighting is not feasible [See Poot et al. (2008) for green lighting on a gas platform off the Dutch coast]. The EIS takes an extreme untenable position that all lighting need be modified [optimal situation], while ignoring that much of the rig and platform lighting is unnecessary [e.g. skyward projection; unblinded windows]. Moreover commercial viability is easily surmountable with a focus on constructive mitigation measures.
16	Table 3.1 Summary of Alternative Analysis Pg 20	Flaring is a major attractant to land birds and seabirds that fly at night and more can be done to minimize the associated risks (Wiese et al. 2000; Ellis et al. 2013).	Provide justification about NOT eliminating reducing flaring at night. And during inclement weather. The Leach's Storm-Petrel is the most vulnerable seabirds to flaring disintegration and platform mortality [Montevecchi et al. 2018]. The species is listed as Vulnerable by the IUCN [International Union for the Conservation of Nature [https://www.iucnredlist.org/species/22698511/119292983] and hence is a species of the highest concern in eastern Canada when the vast bulk of the world's population breeds and forages on the edge of the Grand Bank [Hedd et al. 2018]. The species population has declined precipitously during the past 20 years [Montevecchi et al. 2018. Montevecchi and McFarlane Tranquilla 2019].
17	Table 3.1 Summary of Alternative Analysis Pg 20	Spectral modified lighting - No– limited capabilities in extreme weather safety concerns with helicopter approach and landing	A hybrid of both spectral modified light and standard MODU lighting, using standard lighting when helicopters are approaching needs serious consideration not simply a dismissal.
18	Table 3.1 Summary of Alternative Analysis Pg 21	Some limited offshore effects are expected from the light and atmospheric emissions generated during flaring. These are expected to be intermittent and brief in duration over a temporary period at the end of drilling (assessed in Section 9 of the EIS).	Provide specific information on duration of flaring on drill rigs.
19	Table 6.1 Fish Species of Conservation Interest with	Lanternfish (Myctophids) are likely to be found in the deepwater areas of the project (Rao et al.	Request that lanternfish spp. be added to Table 6.1

	Potential to Occur in the Project Area and/or in the RAA Pg 33	2009).	
20	6.1.1. Baseline Conditions Pg 32, 4th paragraph	The Northeast Newfoundland Slope Closure is a marine refuge designated by DFO which is closed to bottom contact fishing to protect corals and sponges in this area and encompasses all of ELs 1145, 1146 and 1148.	If these areas are closed by DFO to bottom contact fishing, why is drilling allowed in these areas? Justify discrepancy.
21	6.1.1. Baseline Conditions Pg 32, 5th paragraph	Capelin is an extremely important food source for many of the larger ocean predators as well as seabirds (DFO, 2011).	How will the capelin be affected by its proximity to the project in terms of mortality, attraction, or changes in behavior?
22	6.1.3.1 Change in Risk of Mortality or Physical Injury Pg 36 last paragraph	Herring and capelin are forage species that are extremely important for the structure of the NW Atlantic food web. Impact on the populations of these fish could impact their predators' populations, including cod stocks (DFO, 2011).	Request that impact on the population of forage fish species such as capelin and herring be carefully considered, especially regarding seismic survey and waste discharge.
23	6.1.3.1 Change in Risk of Mortality or Physical Injury Pg 37, 1st paragraph	McCauley et al. (2017) have found that seismic surveys would kill more than 50% of the plankton within a 1 km area and that the mortality could be expanded over a period of two days for one seismic survey.	Request that monitoring be done on plankton mortality immediately after each seismic survey and 48 hours later.
24	6.1.3.1 Change in Risk of Mortality or Physical Injury Pg 37, 3rd paragraph	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 (Gates and Jones 2012; Cordes et al. 2016; Henry et al. 2017).	How can it be 'not predicted to result in irreversible changes' when there is lack of data on the effects? Justify this conjecture.
25	6.1.3.1 Change in Risk of Mortality or Physical Injury Pg 37, 3rd paragraph	Transport Canada's *Ballast Water Control Management Regulations* and/or MARPOL, and are not expected to cause mortality or physical injury to marine fish.	Where are the data to support this statement?

26	6.1.3.2 Change in Habitat Quality and Use Pg 37, 4th paragraph	Certain light wavelengths can reduce light attraction of certain fish species. Long wavelengths do not attract certain species of mackerel and squid (review by Nguyen & Winger 2018).	Consider using red light instead of white light projected on the water to reduce fish and zooplankton attraction.
27	6.1.3.2 Change in Habitat Quality and Use Pg, 38 4th paragraph	Introducing infrastructure will promote colonization of the area and then removing it may cause further damage to the distribution of benthic species (Wolfson et al. 1979).	Request that all infrastructure that have been in the water for enough time for colonization by multiple species be abandoned in place to mitigate disturbances.
28	6.1.4 Potential Effects from Accidental Events Pg 38, last sentence	Fish kills are typically brief and localized following a discrete spill event due to the rapid loss of the acutely lethal low-molecular weight components of oil due to dilution and weathering (Lee et al. 2015), the ability of mobile species to detect and avoid impacted areas, and the ability of phytoplankton, zooplankton, and adult fish to metabolize hydrocarbons (Wolfe et al. 1996; Graham et al. 2010).	What about long-term effects and bioaccumulation? May be harder to detect than mass fish kills. What is being done to address this issue?
29	6.1.4 Potential Effects from Accidental Events Pg 39, 2nd paragraph	Larval and juvenile pelagic and benthic fish species are at a greater risk of exposure as they are often less mobile than adults (Yender et al. 2002) and have shown higher sensitivity to lower concentrations of hydrocarbons, since they may not have yet developed detoxification systems allowing them to metabolize hydrocarbons (Rice 1985; Carls et al. 1999; Incardona et al. 2013; Lee et al. 2015).	Negative effects on larval and juvenile pelagic and benthic fish species could also negatively affect population size on a whole. Address this issue.
30	6.1.4 Potential Effects from Accidental Events Pg 39, 2nd paragraph	The chronic effects of spills may override any catastrophic spills (Fraser & Racine, 2016), Morandin & O'Hara (2016) have found that sheens around oil platforms can induce the death of seabirds. Large spills are not necessarily the most potent threat to seabirds.	Request that comprehensive monitoring be undertaken to record ongoing smaller scale sheens and spills on the water and on the fauna that comes in contact with it. Independent observers on platforms would provide the best assurance of proper monitoring.
31	6.1.4 Potential Effects from Accidental Events Pg 39, 3rd paragraph	In the unlikely event of an actual well blowout, mitigation (including emergency response measures such as containment and recovery operations) would be implemented well before	How is this statement backed up? It took 87 days to mitigate Deepwater Horizon, which was only half as deep as some of the wells proposed for this project. There were 6000 skimmer vessels

		120 days elapse, thereby likely reducing the magnitude, duration, and geographic extent of the spill, and associated residual environmental effects.	deployed in the *Deepwater Horizon* blowout in the Gulf of Mexico – a very much more benign environment than the Orphan Basin – and 3 % of the oil was estimated to be collected. Does BP expected less than 3 % of the oil to be collected in possible blowout in the Orphan Basin?
32	6.1.4 Potential Effects from Accidental Events Pg 39, 4th paragraph	This will create a temporary and reversible degradation in habitat quality.	Where is the evidence to back this up this conjecture?
33	6.1.4 Potential Effects from Accidental Events Pg 39, 5th paragraph	With respect to a change in habitat quality and use following an SBM spill, it is conservatively predicted that there would likely be a temporarily and reversible degradation in habitat quality within approximately a 1 km-radius from the spill site. The acute toxicity of SBM is considered relatively low and would not result in adverse effects from contamination of marine biota or habitats.	Where is the evidence to back this highly speculative conjecture?
34	6.1.4 Potential Effects from Accidental Events Pg 39, 5th paragraph	Misleading statement that the effects will be local. Discharge of gray water effluent has a reefing effect on the platform and, as such, promotes algae growth leading to fish attraction (Wolfon et al. 1979; Baird, 1990). Burke et al (2015) have documented this phenomenon of nocturnal feeding by gulls that take up residency at the base of the Hibernia platform because of the abundance of food around the platform. The effects will extend to species foraging over a large range being suddenly attracted to the increase productivity around the platform.	Request that the language be changed to reflect the aggregation phenomenon induced by waste disposal at sea from species outside of the immediate project area.
35	Table 6.2 Marine and Migratory Bird Species of Conservation Interest Likely to Occur in the RAA Pg, 41	The Leach's Storm-Petrel is the most vulnerable seabirds to flaring disintegration and platform mortality [Davis et al. 2017, Montevecchi and McFarlane Tranquilla 2019]. The species is listed as Vulnerable by the IUCN [International Union for the Conservation of Nature [https://www.iucnredlist.org/species/22698511	Request that Leach's Storm-Petrels and White-tailed Tropicbirds be added to the list of bird species likely to interact with the platform.

		/119292983]. Hence it is a species of the highest concern in eastern Canada where the vast bulk of the world's population breeds and forages on the edge of the Grand Bank [Hedd et al. 2018]. The species population has declined precipitously during the past 20 years [Montevecchi and McFarlane Tranquilla 2019]. Bermuda White-tailed Tropicbirds have also been found in the project area (Mejías et al. 2017) during the non-breeding season.	
36	6.2.3.1 Change in Risk of Mortality or Physical Injury Pg 43, 1st paragraph	There may be a slight increase in mortality / injury levels due to collisions, disorientation, and potential predation, although, based on previous monitoring, the mortality rate is anticipated to be low as most stranded birds encountered on platforms and vessels are released successfully in accordance with the Procedures for Handling and Documenting Stranded Birds Encountered on Infrastructure Offshore Atlantic Canada (ECCC 2016).	The statement does not line up with personal communication statement from former marine observers on these platforms. Who keeps track of the handling and documenting of stranded birds? Provide evidence to support this unfounded speculation.
37	6.2.3.1 Change in Risk of Mortality or Physical Injury Pg 43, 1st paragraph	Leach's Storm-Petrels are nocturnal seabirds highly attracted to platform light and flaring. 3.3 million of these birds are unaccounted for during the past 25 years [Montevecchi and McFarlane Tranquilla 2019]. As Leach's Storm-Petrel is an IUCN listed Vulnerable species, its conservation is of the highest priority for conservation.	Request to only accept reduced flaring (no nocturnal flaring) to avoid mass mortality of Leach's Storm-Petrels. There is no ambiguity about the effect of night flaring on this species. To date, there has been no comprehensive monitoring schemes undertaken to quantify the extent of the damage to seabirds and other organisms. This claim is erroneous and minimizes the fact that seabird populations will suffer On what evidence is this claim of only slight increase in bird injury/mortality made? Request data and references used to make this claim.
38	6.2.3.1 Change in Risk of Mortality or Physical Injury Pg 43, 1st -2nd paragraph	Diving birds (or any birds) that come in contact with oil are likely to die from hypothermia, drowning from loss of buoyancy, oil ingestion, starvation (Templeman, 2010).	Request that the EA reflect the long-term harmful impact of oil sheens,spills and contaminants, instead of minimizing their consequences. Regardless of time the oil will be present on the water, it will cause seabirds' deaths. What

		Rehabilitation of oiled birds is ineffective at the population level (Anderson et al. 1996; Briggs et al. 1997). The only way to mitigate seabird mortality from oil is to prevent the plumage contact with oil (Russell & Fifield, 2001).	measures will be put into place to prevent these deaths?
39	6.2.3.1 Change in Risk of Mortality or Physical Injury Pg 43, 4th paragraph	In Atlantic Canada, nocturnal migrants and nocturnally-active seabirds such as Leach's storm-petrel are the marine and migratory birds most at risk of attraction to flares, although potential mortality resulting from such interactions is poorly understood.	Through personal communication with former marine observers it seems apparent that there have been mass mortality of Leach's storm-petrels events associated with the platforms, in which they were being 'shovelled off the deck in bucket loads', when the brightly lit Hebron platform was being constructed in Bull Arm on 29 September 2016. This potential mortality is poorly understood because the C-NLOPB has never required adequate monitoring at offshore oil platforms. Be explicit about the lack of adequate data about seabird mortality on platforms in the NW Atlantic.
40	6.2.3.1 Change in Risk of Mortality or Physical Injury Pg 43, 4th paragraph	Fatal light attraction is a huge and well-understood mortality driver in birds. Sources of light at night in a usually dark environment like the ocean is a major source of attraction for seabirds. Flaring at night could induce mass mortality of birds, particularly vulnerable nocturnal seabirds like Leach Storm-Petrels and shearwaters (Reed et al. 1985; Tasker et al. 1986; Baird et al. 1990; Montevecchi et al. 1999; Wiese et al. 2001; Gaston et al. 2008; Poot et al. 2008; Rodríguez et al. 2012). Flaring in the day only could help reduce this mortality. The Migratory Birds Convention Act makes the killing of these birds illegal.	There is no ambiguity about the effect of flaring on migratory bird species, especially nocturnal ones, protected under the Migratory Birds Convention Act. Request that flaring be shut down at night, critical migratory times for Leach's Storm-Petrels are in September and October. Request that flaring be done under the observation of independent party to record the attraction of seabirds to the rig and flaring and platform mortality.
41	6.2.3.1 Change in Risk of Mortality or Physical Injury Pg 43, 4th paragraph	To date, independent observers have never been allowed on platforms to observe and monitor the interactions and mortality of seabirds (Fraser & Carter 2018). Many of the claims made about the impact of the project on seabirds are understated.	Request that independent observers take responsibility for observing and monitoring seabirds at platforms in order to record comprehensive scientifically robust data for incorporation in mitigation procedures.

42	6.2.3.2 Change in Habitat Quality and Use Pg 44, 2nd paragraph	The seabird most vulnerable to light attraction – the Leach's Storm-Petrel - has had its population plummet by 3,300,000 during the 25 years that oil production has been going on the Grand Banks. Flaring, especially nocturnal flaring, illumination of the platform and supply vessels and waste discharges all attract and induce episodic seabird and migratory bird mortality. Illumination from nocturnal flaring will transmit light beyond the RSA and attract birds. A single nocturnal flaring event could kill a significant number of birds (Reed et al. 1985; Wiese et al. 2001; Rodríguez, 2012; Rodríguez et al. 2017a, 2017b) This is especially worrisome for birds that are already threatened and count only a few individuals in the remaining population such as the Bermuda White-Tailed Petrel (Mejias et al. 2017). They are one of the most endangered species of seabirds with a population left of only 146 mature individuals (BirdLife International, 2016).	Request no nocturnal flaring to avoid unnecessary mortality of Leach Storm-Petrels. There is no ambiguity about the effect of night flaring on this migratory bird species protected under the Migratory Birds Convention Act and listed as vulnerable by the IUCN. Flaring at night would directly infringe on this act.
43	6.2.4 Potential Effects from Accidental Events Pg 44, last paragraph	With respect to a change in habitat quality and use for migratory birds, hydrocarbon spills are not likely to permanently alter the quality of marine bird habitat.	There are still ongoing after effects of the Deepwater Horizon spill, may not be 'permanent' but very long lasting and detrimental to marine species. (https://oceanservice.noaa.gov/news/apr17/dwh-protected-species.html). Considering BP involvement in the Deepwater Horizon disaster, address issue about long-term effects of a blowout.
44	6.2.4 Potential Effects from Accidental Events Pg 45, 3rd paragraph	With respect to a change in habitat quality and use, the majority of diesel from a spill from either the MODU or PSV will evaporate and disperse within days following the release (refer to Appendix D of the EIS and RPS 2017).	Dispersing of diesel in the ocean may still be harmful to species through bioaccumulation. Acknowledge this possibility.
45	6.3.3.1 Change in Risk of Mortality or Physical Injury Pg 48, 1st paragraph	Baleen whale species that may occur in the Project Area include species that are documented to have been struck by ships	Right whales are very highly endangered; a single mortality can have detrimental effects on the population as a whole. Explicitly acknowledge this

		(Jensen and Silber 2003), with fin whales being the most frequently struck followed by humpback and right whales (Laist et al. 2001; Jensen and Silber 2003; Panigada et al. 2006; Douglas et al. 2008).	risk. Does such risk vary seasonally of geographically? Such information is needed for risk mitigation.
46	6.3.3.2 Change in Habitat Quality and Use Pg 49, 1st paragraph	The importance of underwater sound to sea turtles is not well known but is thought to be less important than for marine mammals.	If it is not well known, no conclusions can be made. This statement - 'thought to be less important than for marine mammals' - needs to be supported by scientific references.
47	6.3.3.2 Change in Habitat Quality and Use Pg 49, 1st paragraph	Discharge of gray water effluent has a reefing effect at the platform and, as such, promotes algae growth leading to fish attraction (Wolfon et al. 1979; Baird, 1990). The chemical effects can spread through ocean habitats through predator-prey interaction, may not be simply localized (Wolfson et al. 1979; Templeman, 2010; Burke et al. 2012).	The negative effects of effluent discharge on marine mammals and turtles is actually likely in the context of the attraction of larger predators (marine mammals and birds) to the platform due to the increased presence of fish and warm water.
48	6.3.4 Potential Effects from Accidental Events Pg 50, 3rd paragraph	With respect to shoreline oiling, stochastic modelling for a 120-day unmitigated release indicates that the highest average probability that emulsified oil with thicknesses exceeding 1 g/m_2 could intersect the boundary of a special area of importance for marine mammals and sea turtles from either hypothetical wellsite is 2.6% (from the West Orphan Basin during the winter). This 2.6% probability is applicable for Placentia Bay Extension EBSA, which supports high aggregation of cetaceans and leatherback sea turtles in the spring and summer.	Is 2.6% probability only applicable for Placentia Bay Extension in winter? Is it applicable to spring and summer? What about other important areas?
49	6.3.4 Potential Effects from Accidental Events Pg 51, 1st paragraph	Diesel fuel would disperse faster than crude oil, limiting the potential for surface exposure, although there would be increased toxicity associated with this spill and risk of inhalation of toxic fumes is present for either type of spill (crude oil or diesel).	Dispersion of oil in the ocean is still degradation of habitat quality, and can still possibly harmful to marine mammals and sea turtles. If ingested or inhaled even in small doses, what are the long term effects?
50	6.4.1 Baseline Conditions Pg 51, 2nd last paragraph	The Northeast Newfoundland Slope Closure marine refuge is the only one that occurs within	How is it allowed that there is oil exploration within an area of marine refuge? Does that not

		the Project Area (24, 4406 km^2 of co-occurrence, or 44% of the total area of the marine refuge).	defeat the purpose of a marine refuge? Justify seismic activity and drilling in an MPA.
51	6.4.4 Potential Effects from Accidental Events Pg 55, 3rd paragraph	However, these special areas are primarily designated to protect corals and sponges and the potential for sponges and corals on the seafloor to be exposed to surface or in-water oil, particularly at these water depths is considered low.	These special areas are primarily designated to protect coral and sponges? Justify why is it allowed to dump drill muds and cuttings over them which smothers them?
52	Pg 61, 3rd paragraph	Significant effects could occur to marine and migratory birds in the unlikely event of a 100-bbl diesel spill or PSV diesel spill however, it is predicted that the number of birds affected would be limited due to the short time and small area where the diesel would be on the water's surface.	It is predicted that the number of birds affected would be limited? Statement makes no sense - how could it possibly be unlimited?
53	6.7 Cumulative Effects Pg 66, 2nd paragraph	Past, present, and future physical activities that are considered in the cumulative effects analysis because they have potential to result in residual environmental effects that may interact cumulatively (i.e., overlap spatially and temporally) with the residual environmental effects of the Project within the RAA include: • offshore gas development projects (Hibernia Oilfield, Terra Nova Oilfield, White Rose Oilfield, and Hebron Oilfield)	Considering cumulative effects, the White Rose Oilfield recently spilled a reported 250,000 l of crude oil presumably due to restarting production during sea-state involving 8 – 9 m seas during a major global storm. This is the biggest spill in offshore Newfoundland history. https://www.cbc.ca/news/canada/newfoundland-labrador/husky-energy-whiterose-searose-oil-spill-1.4912359. Clearly there is urgent need for precautionary regulations that would preclude such unnecessary ocean pollution. Please explicitly comment on the role of regulation in minimizing cumulative effects of offshore oil production.
54	6.7 Cumulative Effects Pg 67, 2nd paragraph	It is a bold statement to assume that this project will have low cumulative repercussions on the entire fauna in the vicinity. Data to assess the cumulative effects of oil and gas projects are missing due to a lack of adequate research and monitoring and transparency from the operating companies but most critically from the C-NLOPB (Fraser & Ellis 2009; Fraser & Russell 2016).	Independent observers are required to record the project's activities and faunal interactions. Data need to be made publicly available in order to accurately determine if the cumulative effects are indeed low, as claimed in the EIS.

55	6.7 Cumulative Effects Pg 67, 2nd paragraph	Low magnitude impact on a declining population may tip them beyond the minimum sustainable numbers. The predicted low magnitude negative effects on the population of Leach Storm-Petrel may be not be reversible given the extent of their decline.	Request that EIS be repeated annually with data from independent observers to finely monitor the populations of Vulnerable and Endangered species impacted by the projects to avoid further decline.
56	6.7 Cumulative Effects Pg 67, 3rd paragraph	Given the generally low magnitude and temporary nature of Project residual effects, the Project's contribution to cumulative adverse effects is low. It is concluded therefore that no additional mitigation measures beyond those in place to mitigate the Project's direct effects are needed to address potential cumulative effects on marine fish, migratory birds, marine mammals, and sea turtles.	Include seabirds that occupy the Orphan Basin. Include additional mitigation measures that could be applied are arms-length marine observers, decreased flaring at night especially during the Leach's Storm-Petrels migration period in September and October, and modified platform-lighting, e.g. reduce/eliminate skyward illumination.
57	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 70, Row 4	BP and contractors working on the Project will regularly monitor weather forecasts to forewarn PSVs, helicopters and the MODU of inclement weather or heavy fog before it poses a risk to their activities and operations. Extreme weather conditions that are outside the operating limits of PSVs or helicopters will be avoided, if possible. Captains / Pilots will have the authority and obligation to suspend or modify operations in case of adverse weather or poor visibility that compromises the safety of PSV, helicopter, or MODU operations.	Specify the operating limits. These conditions need to be more rigorous with the addition of regulations about not operating in certain sea state conditions. For example the recent spill by the Sea Rose FPSO, a decision was made to restart operations during 8 – 9 m residual swell from the storm. Would BP adhere to similar operating limits? https://www.cbc.ca/news/canada/newfoundland-labrador/husky-energy-whiterose-searose-oil-spill-1.4912359
58	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 71, Row 13	Modified green spectral lighting has been found to reduce the attraction of seabirds to the platform at night (Poot et al. 2008; Marquenie et al. 2014; Rodríguez et al. 2017).	Using green spectral lights at night will mitigate fatal light attraction. What is the rationale to not do so? On what basis is the statement "non-commercial viability" made? See (Poot et al. 2008; Marquenie et al. 2014; Rodríguez et al. 2017).
59	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 71, Row 14	Stranded birds on the MODU and PSVs will be recovered using the methods from *Procedures for Handling and Documenting Stranded Birds Encountered on Infrastructure Offshore Atlantic Canada* (ECCC 2016).	Will there be trained monitors/marine observers on board that will be attending to these procedures? Specify procedures for dead birds, carcasses and estimates of birds incinerated in the flare.

60	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 72, Row 21		Request for no nocturnal flaring to minimize mortality of Leach's Storm-Petrels. There is no ambiguity about the effect of night flaring on this IUCN Vulnerable migratory seabird species protected under the Migratory Birds Conventions Act. Flaring at night would directly infringe on this act.
61	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 72, Row 23, 24, 25	Ballast water will be discharged… …There will be no discharge of macerated food waste within 3 nm from land. Sewage will be macerated in accordance with MARPOL and in line with the OWTG prior to discharge.	Ballast water, macerated food waste and macerated sewage discharged at the platform will fertilize algal growth and attract fish and invertebrates. Address this influence that will be promoted by platform discharges.
62	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 73, Row 30		Request that flaring be done under the observation of an independent party to record the attraction and mortality of seabirds at the platform.
63	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 74, Row 38	During transit to/from the Project Area, PSVs will travel at vessel speeds not exceeding 22 km/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. Marine mammal and sea turtle sightings will be recorded opportunistically during PSV transit. In the unlikely event of a vessel collision with a marine mammal or sea turtle, BP will contact the Canadian Coast Guard within 24 hours following the collision.	There is a critical need for designated dedicated observers on these boats not simply "opportunistic" observations for which no one is responsible. Address the issue of dedicated observers.
64	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 74, Row 39		Consider using green spectral lights at night to mitigate fatal light attraction.
65	Table 7.1 Summary of Standard and Project-Specific Mitigation Pg 75, Row 44	In the unlikely event of a spill, specific monitoring (e.g., environmental effects monitoring) and follow-up programs may be required and will be developed in consultation with regulatory agencies, Indigenous groups,	If there is a spill, follow-up programs should ALWAYS be required. Be explicit about this necessity.

		and fisheries stakeholders as applicable.	
66	Table 8.1 Summary of Residual Effects for Routine Operations Pg 77	Table 8.1 Summary of Residual Effects for Routine Operations	Table 8.1 indicates that in all incidences that potential events are reversible. Present evidence for the reversibility of events.
67	Table 8.2 Summary of Residual Effects for Accidental Events Pg 80	Table 8.2 Summary of Residual Effects for Accidental Events	Table 8.2 states that in all incidences that potential events are reversible. In the event of a well blowout or a diesel spill the event could be irreversible. Make an explicit statement about such reality.
68	Table 8.3 Summary of Residual Environmental Effects for Routine Operations, Accidental Events and Cumulative Effects Pg 81	Table 8.3 Summary of Residual Environmental Effects for Routine Operations, Accidental Events and Cumulative Effects	Table 8.3 indicates that during routine operations there is no significant environmental effect on marine and migratory birds. However flaring and light pollution may have a significant environmental effects, particularly the Leach's Storm-Petrel and marine fishes. As well greasy produced water can ruin the waterproofing integrity of seabird plumage (O'Hare and Morandin 2010). Qualify statements to acknowledge potential significant residual effects.
69	8.0 SIGNIFICANCE OF RESIDUAL EFFECTS Pg 81, 2nd paragraph	In summary, the Project is not likely to result in significant residual adverse environmental effects, including cumulative environmental effects, provided that the proposed mitigation is implemented.	This statement is not true. The Project is very likely to result in adverse environmental effects, especially as there are not mitigations for flaring and platform-lighting. Reverse false statement.
70	9.0 FOLLOW-UP AND MONITORING PROGRAMS Pg 83, 4th paragraph		Request that "routine inspection" be replaced by "systematic inspection" and be performed by independent observers.
APPENDIX E			
Appendix E 1	Title Page and Pg E.1	To understand the events surrounding the *Deepwater Horizon* blowout, provide more information regarding lessons learned	It is in accurate to refer to the *Deepwater Horizon* blowout as an accident, as it is clear that the blowout occurred due to a failure of rig personnel training and to engineering errors on BOP
Appendix E 2	Pg E.1	To understand and appreciate the environmental costs associated the *Deepwater*	Provide information on amount of oil released into the Gulf of Mexico.

		Horizon blowout, provide more information regarding lessons learned	
Appendix E 3	Pg E.1	To understand and appreciate the environmental costs associated the *Deepwater Horizon* blowout, provide more information regarding lessons learned	Provide information on amount of dispersant released into the Gulf of Mexico. Provide information on dispersant effects on marine and human life [Paris et al. 2018).
Appendix E 4	Pg E.1	To understand and appreciate the environmental costs associated the *Deepwater Horizon* blowout, provide more information regarding lessons learned	Provide information on bird mortality associated with the *Deepwater Horizon* blowout the Gulf of Mexico (Montevecchi et al 2011).
Appendix E 5	Pg E.1	To be explicit about lessons not learned from the *Deepwater Horizon* blowout, provide information on the exploratory drilling of the Orphan Basin deep-water wells in 2010	Make explicit that on 10 May 2010 with 3 weeks of the *Deepwater Horizon* blowout and while the US was under a deep-water drilling moratorium, the *Trans-Ocean Stena Carron* (Chevron project) drilled the deepest well [2.5 km] in Canadian history in the Orphan Basin.
Appendix E 6	Pg E.1	To be explicit about lessons not learned from the *Deepwater Horizon* blowout, provide information on the exploratory drilling of the Orphan Basin deep-water wells in 2010	Make explicit that when the *Trans-Ocean Stena Carron* (Chevron project) drilled the deepest well [2.5 km] in Canadian history in the Orphan Basin, there were no independent bird or mammal observers on site.
Appendix E 7	Pg E.4, 3	**Critical factor: Hydrocarbons entered the well undetected and well control was lost:** 'In retrospect, pressure readings and volume bled at the time of the negative pressure test were indications of flow-path communication with the reservoir, signifying that the integrity of these barriers had not been achieved.'	This is a result of human error/negligence, no guarantee this will not happen again. Specify what procedural modifications will be made to preclude a similar scenario in the Orphan Basin.
Appendix E 8	Pg E.5, 4	**Influx was not recognized until hydrocarbons were in the riser:** 'Indications of influx with an increase in drill pipe pressure are discernible in real-time data from approximately 40 minutes before the rig crew took action to control the well. The rig crew's first apparent well control actions occurred after hydrocarbons were rapidly flowing to the surface.'	Lack of preparation from BP as personnel not properly trained to recognize increase in drill pipe pressure. How is BP addressing this issue in the Orphan Basin? Explicit lessons learned need to be presented.

Appendix E 9	Pg E.5, 5	**Well control response actions failed to regain control of the well:** 'The first well control actions were to close the BOP and diverter, routing the fluids exiting the riser to the Deepwater Horizon mud gas separator (MGS) rather than to the overboard diverter line.'	Again personnel not properly trained on emergency response procedures. The BOP failed and the BOP backup failed. Be explicit about these short-comings and errors, so there can be some confidence that lessons were really learned and that things will be done differently.
Appendix E 10	Pg E.7, 8	**Critical factor: The blowout preventer did not seal the well:** 'The explosions and fire very likely disabled the emergency disconnect sequence, the primary emergency method available to the rig personnel, which was designed to seal the wellbore and disconnect the marine riser from the well.'	Emergency disconnect sequence was disabled when an emergency happens, not a very effective preventer. Explicitly acknowledge that BOP system failed.
Appendix E 11	Pg E.7, 8	**Continued:** 'An examination of the BOP control pods following the accident revealed that there was a fault in a critical solenoid valve in the yellow control pod and that the blue control pod AMF batteries had insufficient charge; these faults likely existed at the time of the accident.'	Again company negligence, lack of maintenance and testing of critical emergency response equipment. These excuses do not lend credibility to lessons learned – these are lessons failed.

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