Attachment 1

CNOOC International Flemish Pass Exploration Drilling Project
Round II Information Requirements from Environmental Impact Statement Review
April 16, 2019

INTRODUCTION

On June 8, 2018, the Canadian Environmental Assessment Agency (the Agency) sent 85 information requirements (IRs) and 28 clarifications to CNOOC Petroleum North America ULC (the proponent) based on the technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed CNOOC International Flemish Pass Exploration Drilling Project. The proponent submitted partial responses to the IRs and clarifications on September 17, 2018. The responses to the remaining IRs and clarifications were submitted on February 8, 2019. The Agency, other federal government experts, and Indigenous groups have reviewed the IR responses and the Agency has prepared additional IRs, as elaborated in this document.

ACRONYMS AND SHORT FORMS

Agency	Canadian Environmental Assessment Agency
CO2	carbon dioxide
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CNOOC	China National Offshore Oil Corporation
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EL	exploration licence
EIS	Environmental Impact Statement
km	kilometre
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
LSA	Local Study Area
m	metre
MMS	Mi’gmawei Mawiomi Secretariat
MODU	mobile offshore drilling unit
MTI	Mi'gmawe'l Tplu'taqnn Incorporated
NAFO	Northwest Atlantic Fisheries Organization
NRCan	Natural Resources Canada

ROV	remotely operated vehicle
RSA	Regional Study Area
SARA	Species at Risk Act
VC	valued component
VSP	vertical seismic profile
WNNB	Wolastoqey Nation in New Brunswick

ROUND II INFORMATION REQUIREMENTS AND REQUIRED CLARIFICATIONS FOR THE CNOOC INTERNATIONAL FLEMISH PASS EXPLORATION DRILLING PROJECT

IR Number	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
IR-01/16-02	Section 5 - All	Part 2, Section 3 Project Description	Section 2.1 Project Scope and Overview; Section 2.5.2.2 Offshore Well Drilling; Section 4.1 Scope of the Environmental Assessment and Factors Considered	In IR-01 the Agency required further information on batch drilling. In response, the proponent provided information on when and how batch drilling may occur, and indicated "batch drilling would be considered if the plan involved drilling multiple close proximity wells with similar well designs." The proponent also provided information on the benefits of batch drilling, including potential environmental benefits; however, there is no discussion of potential negative environmental effects. In IR-16, the Agency required information on the "likely distance" between individual wells in making the determination that there is no potential for overlap and clarification on what is the closest distance that wells could occur to each other. The proponent provided information on the factors that influence the locations of and distances between the exploration wells, but did not provide a likely minimum distance or general "likely distance" between wells. Additional information is required to support the proponent's assertion that there is little or no potential for environmental releases from individual wells to interact or accumulate in the local study area (LSA) and to support conclusions related to cumulative effects of the multi-well drilling program.	Indicate an estimated minimum distance between two wells, both exploration and delineation, and in consideration of this estimate, provide information on potential environmental effects of drilling wells (both batch drilling and standard drilling) in close proximity to each other, including information on potential overlap of released discharges from two or more close proximity wells. If no such overlapping effects are anticipated, provide appropriate justification. Update proposed mitigation and follow-up, as well as significance predictions, as applicable.
IR-08-02	Section 5 - All	Part 2, Section 2.2 Alternative Means of Carrying Out the Project	Section 2.10 Alternative Means of Carrying Out the Project	In IR-08, the Agency required additional information on the technical feasibility of reduced flaring and if well testing while tripping or a pipe conveyed well flow test approach were considered as alternative means. The proponent stated that flaring would be kept to the minimum required. It also stated that a formation flow test may be carried out using a drill pipe conveyed test assembly, reducing the amount of produced water sent to a flare, which suggests that this alternative is a technically and economically feasible alternative to standard well flow testing with flaring. A fulsome analysis of this alternative means in accordance with the Agency's Operational Policy Statement: Addressing "Purpose of" and "Alternative Means" under the *Canadian Environmental Assessment Act, 2012* has not been provided. If this method of well testing is indeed technically and economically feasible, and if it reduces or eliminates the need for flaring, it is not clear why it has not been selected as the preferred option.	Given that the proponent has identified pipe conveyed well flow test technology as a viable alternative to standard well flow testing with flaring, and that this alternative could eliminate or greatly reduce the need to flare, provide a discussion of this alternative means of carrying out the Project in accordance with the Agency's Operational Policy Statement: Addressing "Purpose of" and "Alternative Means" under the *Canadian Environmental Assessment Act, 2012*. Provide information on how these tests are carried out, how they might interact with the environment, and potential environmental effects. Given that this method of well testing could reduce or eliminate the need for flaring, discuss under what circumstances or for what reasons it would not be selected as the preferred option for well testing.
IR-12-2	5(1)(a)(i) Fish and Fish Habitat	Part 2, Section 6.3.1 Fish and Fish Habitat `	Section 8.4.4 Atlantic Salmon	*Additional information on potential habitat use by Atlantic Salmon* Wolastoqey Nation in New Brunswick (WNNB) has advised that the following published research paper presents further evidence of potential use of the project area, not only as a migratory corridor, but also an important foraging area and nursery habitat for Atlantic Salmon: Soto DX, Trueman CN, Samways KM, Dadswell MJ,	Provide a discussion of the results of the Soto et al. (2018) research in the context of the potential use of the project area by Atlantic Salmon. Update the environmental effects analysis, mitigation and follow-up, as applicable. Provide clarification on contradictory information regarding sea-

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				Cunjak RA (2018). *Ocean warming cannot explain synchronous declines in North American Atlantic salmon populations*. Mar Ecol Prog Ser 601:203-213. https://doi.org/10.3354/meps12674 *Sea-surface temperatures - link to Atlantic Salmon presence* Both the EIS and IR-12 response emphasize that sea-surface temperatures in the project area limit the potential for interaction between Atlantic Salmon and the Project. However, WNNB noted that there are competing statements in the response to IR-12. Part 1 of the response states that variable sea-surface temperatures in the project area, particularly regular temperatures below 3˚C, will limit the potential for interactions with the Project. Part 3 states that the limited interaction between salmon migrating within and near the project area and post-smolt and adults feeding north in the Labrador Sea and kelts along the southern edge of the Grand Banks will most likely remain low given the predicted increases in sea-surface temperatures near the project area. WNNB noted that this would only hold true if sea-surface temperatures increased above the thermal tolerance of Atlantic Salmon, and that based on EIS Figure 5-69, mean water temperatures in the project area are projected to increase by as much as 2˚C, putting water temperatures in the preferred thermal range for Atlantic Salmon. WNNB further noted that, although it has been shown that water temperature has been linked to declines in Atlantic Salmon, more recent studies (i.e. Soto et al 2018) have shown that climate change, and in particular increasing ocean temperatures cannot explain the declines in Atlantic Salmon in the North Atlantic.	surface temperatures in the project area and the potential contribution this may make to current and future habitat use trends, taking into consideration the published research by Soto et al. on sea-surface temperatures and Atlantic Salmon distribution.
IR-13-2	5(1)(a)(i) Fish and Fish Habitat	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 8.4.4 Atlantic Salmon	In IR-13, the Agency required the proponent to discuss the need for follow-up related to project-specific or cumulative effects on Atlantic Salmon, including participation in future regional initiatives and potential for collaboration with Indigenous communities. In response, the proponent stated that, in collaboration with industry and other research partners (potentially including Indigenous groups), it may consider supporting research on migratory routes within the offshore project area. The Agency notes that potential effects of the Project on Atlantic Salmon continues to be a key concern for Indigenous groups, and there continues to be some uncertainty regarding the use of the project area by Atlantic Salmon. The Agency understands that additional research in this area is being considered through Petroleum Research Newfoundland and Labrador or through the Environmental Studies Research Fund.	Indicate whether the proponent has become involved in any of the salmon related research initiatives that are being considered or proposed through Petroleum Research Newfoundland and Labrador or through the Environmental Studies Research Fund, and if so, describe how the proponent is supporting these initiatives. If the proponent has identified or is pursuing any other research initiatives or collaborations to improve understanding of Atlantic Salmon in the marine environment and their potential interaction with oil and gas activity in the offshore Newfoundland area, provide information on these activities. For any research activities being considered or undertaken, elaborate on how Indigenous groups would or are being engaged.
IR-15-02	5(1)(a)(i) Fish and Fish Habitat	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 8.3 Environmental Effects	The Agency required the proponent to provide an assessment of the potential effects to Swordfish from noise, spills, and light. In its response,	Provide an assessment of the potential effects of a spill, including of a large scale blowout, on Swordfish. This assessment should include

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			Assessment and Mitigation	the proponent provides information on the effects of routine project operations on Swordfish, but did not discuss the potential effects of spills.	consideration of any existing published research on the biological and behavioural responses of Swordfish to spills and/or exposure to hydrocarbons. The assessment should focus on any effects that may be unique or particularly acute in Swordfish. Update the proposed mitigation and follow-up, as well as effects predictions, accordingly, including providing an overview of any monitoring of effects on Swordfish or fish species in general that would occur in the event of a spill.
IR-26-02	5(1)(a)(i) Fish and Fish Habitat 5(1)(a)(ii) Aquatic Species	Part 2, Section 8 Follow-Up and Monitoring Programs	Section 10.6 Environmental Monitoring and Follow-up	In IR-26, the Agency required the proponent to state whether it intends to verify noise predictions and/or the effectiveness of mitigation measures through a follow-up program. In response, the proponent states that any uncertainty associated with predicted sound levels during operation, as well as predicted effects on marine mammals and sea turtles, is considered low. In addition, it states that the planned mitigation measures would reduce the potential for adverse environmental effects. The Mi'gmawei Mawiomi Secretariat (MMS) and other Indigenous groups have noted that there remains uncertainty regarding the effects of noise, and in particular seismic activity, in the offshore on marine life. MMS has stated that their may be a negative correlation between seismic activity and plankton, which is the very base of the marine food chain. MMS has requested that additional research be completed with regards to seismic testing and negative impacts on marine life. The MMS also stated that there is insufficient research to support the proponent's claim that the proposed mitigation measures are sufficient.	Provide an analysis of the potential effects of vertical seismic profiling on plankton. Discuss any potential areas of uncertainty regarding the effects of seismic activity on plankton and on other marine life.
IR-29-02	5(1)(a)(i) Fish and Fish Habitat 5(1)(a)(ii) Aquatic Species	Part 2, Section 6.4 Mitigation Measures	Section 10.3.2 Summary of Key Mitigation; Table 10.5 Environmental Effects Assessment Summary: Marine Mammals and Sea Turtles; Section 10.6 Environmental Monitoring and Follow-up	In its response to IR-29, the proponent states that a trained Marine Mammal Observer "will continuously observe a pre-determined zone for 30 minutes prior to the start-up of the vertical seismic profile (VSP) sound source array" and that "the pre-determined zone is typically defined as a 500 metre (m) radius surrounding the mobile offshore drilling unit". This response suggests that only offset VSP surveys would be undertaken; however, in section 2.5.2.3 of the EIS, the proponent states "walk-away VSP surveys may also be undertaken". Having the Marine Mammal Observer positioned on the mobile offshore drilling unit during a walk-away VSP survey may not result in desired mitigation outcomes.	In the event that walk-away VSP surveys are undertaken, describe where the Marine Mammal Observer would be positioned and the location and size of the pre-determined observation zone.
IR-34-02	5(1)(a)(iii) Migratory Birds	Part 2, Section 6.3.5 Migratory Birds and 6.6.3 Cumulative Effects Assessment	Section 9.3.3.2 Residual Environmental Effects Assessment	In its response to IR-34, the proponent states that "available studies on attraction of birds to offshore lighting from oil and gas production facilities have demonstrated attraction distances of less than 2 kilometres (km) (Day et al 2015) to as much as 5 km (Poot et al 2008), although attraction from distances of much greater than 5 km could not be ruled out in the Poot study. Attraction of marine and migratory birds from greater distances than	1) Using a precautionary approach that assumes a larger zone of influence than 5 km, and potentially up to 16 km or more, update the effects assessment of artificial lighting on marine and migratory birds. 2) Provide an assessment of the cumulative effects of artificial

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				the 5 km zone of influence assumed in the EIS would result in a greater number of birds potentially affected by artificial lighting associated with the Project. To date, we are unaware of any studies demonstrating attraction from such large distances." Based on this response, ECCC has advised that, due to the uncertainty of the Poot et al (2008) study, specifically that distances larger than 5 km could not be ruled out, there is no scientific basis that would support an assumption that a 5 km zone of influence is sufficient. Additionally, given the lack of research related to the specific distance that birds are attracted to lit structures in an otherwise dark environment, the proponent should adopt a precautionary approach that assumes a larger zone of influence, pending additional evidence to support a smaller zone of influence. In its response to IR-84, the proponent also states that "a recent global positioning system tracking study on the related Cory's shearwater found that fledging birds from colonies up to 16 km away…were apparently susceptible to stranding due to light attraction". The proponent also stated that "MODUs typically have fewer light sources than stationary production facilities such as those considered in the Poot study. The potential for associated attraction effects from a MODU is predicted to be smaller in magnitude and there are no implications for the assessment of associated effects in the EIS." Based on this response, ECCC has advised that the presence of artificial lighting along the foraging flight path for nocturnal seabirds, particularly the Leach's Storm-Petrel, should be the basis of the analysis rather than the magnitude of the lighting on MODUs compared to stationary production facilities. ECCC has also advised that, In addition to migratory birds being attracted to offshore exploration and production facilities, the cumulative effects of artificial lighting has created a significant footprint in the offshore which did not exist a few decades ago. See the following website (https://www.lightpollutionmap.info/) and the associated research paper (Cizano et al 2001) for a worldwide light pollution atlas that depicts the footprint created by all existing projects currently present in the offshore environment. The cumulative effects of multiple artificial light footprints illuminating a previously pristine environment should be considered, 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 project area).	lighting from the Project in combination with lighting from other sources in the offshore along the foraging flight path for nocturnal seabirds, particularly Leach's Storm-Petrel, and the associated mitigation measures to reduce the effects to nocturnal seabirds.

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				References: 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	
IR-37-02	5(1)(a)(iii) Migratory Birds	Part 2, Section 6.3.5 Migratory Birds	Section 9.3.3. Presence and Operation of MODUs	In IR-37, the Agency required additional information and context regarding information presented in Section 9.3.3 of the EIS in relation to bird strandings and searches on offshore vessels. The following is a quote from the proponent's response to IR-37: *"In both Ellis et al. 2013 and Environment Canada 2015, Leach's Storm-petrels were the most commonly found species stranded on vessels. These reports were not specific to oil and gas, and included vessels of various types, including fishing and research vessels as well as oil and gas-related vessels."* ECCC has advised that strandings information is usually restricted to oil and gas related vessels because these vessels require a seabird handling permit. Generally, fishing and research vessels (and other vessels) do not report strandings information. In addition, ECCC has advised that the use of Environment Canada 2015 is not appropriate in this context. The guidance document only briefly summarizes the issue of strandings on vessels and does not specifically reference Leach's Storm-petrel strandings.	Clarify whether Ellis et al.'s 2013 results were restricted to the number of birds found on decks of oil and gas platforms only.
IR-39-02	5(1)(a)(iii) Migratory Birds	Part 2, Section 6.3.5 Migratory Birds	Section 9.6 Environmental Monitoring and Follow-Up	In its response to IR-39, the proponent states that, if there is a future regulatory requirement to incorporate technology such as radar and thermal imaging into monitoring, it would comply with it. However, the proponent does not provide information on the benefits and potential effectiveness of implementing these measures compared to and in combination with the use of trained seabird observers and standard reporting in accordance with the Seabird Handling Permit.	Provide details on the potential benefits, effectiveness, and need for incorporating technology such as radar and thermal imaging into bird monitoring. Comment on the technical and economic feasibility of incorporating these measures into the Project.
IR-47-02	Section 5 - All	Part 2, Section 6.3 Predicted Effects on Valued Components	Section 11.3.3 Environmental Effects Assessment (All Planned Components and Activities) Table 11.3	In its response to IR-47 the proponent provides updated information on special areas that could be affected by the Project, including updated tables and figures with listings of all special areas that could be affected by the Project. This includes a table indicating the minimum distances to the ELs for special areas in the regional study area (RSA). However, in CL-19-02 below the Agency requests that the proponent update the RSA in consideration of the revised model domain and zone of influence. The list of special areas occurring in the RSA, their distances to the ELs, and the potential effects of the Project on these special areas has not been updated based on this new RSA.	In conjunction with the required update to the RSA (see CL-19-02 below), provide updated tables and a related figure(s) with listings of all special areas in the RSA. Indicate closest distances of all special areas to both ELs 1140 and 1150. For any newly identified special areas that are within the updated RSA, provide an assessment of potential effects on these special areas and consider proposed mitigation and follow-up.

IR Number	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
IR-56-02	5(2)(b)(i) Health and Socio-Economic Conditions	Part 2, Section 6.3.8.2, Commercial Fisheries	Section 13.3.7 Wellhead Decommissioning; Section 2.5.2.5 Well Abandonment or Suspension	In its response to IR-56, the proponent provides further information related to wellhead removal and potential effects of the presence of a wellhead on commercial fisheries. However, additional information is required with respect to decisions associated with leaving a wellhead in place rather than cutting it below the mud line. While the proponent states that there has been no indication of damage to fishing gear in Atlantic Canada due to the presence of abandoned wellheads, information on actions to be taken if damage did occur to fishing gear from and abandoned or suspended wellhead is required.	Provide information on the specific circumstances in which a wellhead would be cut above the seafloor/mudline rather than below the seafloor/mudline. Provide information related to the height at which a wellhead would protrude above the seafloor if it was not cut below the surface/mudline. If the height of wellheads could vary, discuss the factors that would determine the height at which they are cut. In addition, confirm if compensation would be provided if fishing gear was damaged as a result of a suspended wellhead or an abandoned wellhead that was not cut at or below the seafloor/mudline.
IR-59-02	Multiple VCs – Accidents and Malfunctions	Part 2, Section 6.6.1, Effects of Potential Accidents or Malfunctions	Section 16.2.2 Dropped Objects	In its response to IR-59, the proponent states that if larger inert objects, such as drill pipe, core sampling equipment, etc., are lost overboard, efforts would be made to recover these objects. If the object is not recoverable due to technical or safety reasons, the object would be left on the seabed. However, information is not provided in relation to the factors that would be considered in the decision to leave the object on the seabed or if other ocean users would be notified of the object.	Provide an overview of the process for determining if an object would be left in place on the seabed and the factors that would be considered in making the decision. Confirm if other ocean users and/or regulatory agencies would be notified of the decision to leave an object on the seabed and its location. If so, discuss how other oceans would be notified.
IR-61-02	Multiple VCs – Accidents and Malfunctions	Part 2, Section 3.1, Project Components; and Section 3.2.1, Drilling and Testing Activities	Section 16.4.3 Model Data Input	In response to IR-61, the proponent provided additional information on the composition of marine diesel and crude oil used in modelling and the fate of crude oil and diesel in the environment. NRCan notes that there seems to be an assumption that biodegradability depends only on time and not on the contents of different types of hydrocarbons. NRCan notes that diesel hydrocarbons are mostly biodegradable; however, a significant proportion of crude oil hydrocarbons are not biodegradable, particularly components of the hydrocarbons that boil above 380°C (e.g. aromatics, resins, and asphaltenes). This is the reason why crude oil is persistent.	Provide an explanation of the scientific basis for the apparent assumption that organic components of hydrocarbons that boil above 380°C (e.g. aromatics, resins, and asphaltenes) can be completely biodegraded.
IR-63-02A	Multiple VCs – Accidents and Malfunctions	Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions	Revised Section 16	The Agency required completion of fate and behavior modelling to reflect the worst-case discharge scenario, and updated effects assessment as applicable. In response, the proponent completed oil spill modelling based on a longer release duration of 120 days, with a model duration to 160 days. Following completion of the revised spill modelling, the proponent updated the Accidental Events section (Section 16) of the EIS to include additional modelling information. Section 16.6.1.4 was updated to include Table 16.19 illustrating valued components and corresponding relevant modelling results for subsurface/subsea releases (120-day release). This table indicates for special areas that there is a low chance of interaction with the sea surface following a 120-day release. However, Table 16.18 indicates for special areas that there is a high chance of interaction of the valued component with the sea surface following a 30-day release. It is unclear why there is a higher chance of interaction in the 30-day	Provide clarification on the chance of interaction between a spill and the sea surface component of special areas (Table 16.18 and Table 16.19 in revised Section 16). If the chance of interaction is higher for a 30-day release compared to a 120-day release, provide further details to explain this conclusion.

IR Number	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/ Information Requirement
				release than for the 120-day release.	
IR-63-02B	Multiple VCs – Accidents and Malfunctions	Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions	Revised Appendix – Trajectory Modelling in Support of the Nexen Energy ULC Flemish Pass Exploration Drilling Project	Characterization of the type of shoreline habitat in the revised trajectory modelling appendix (Figure 3-1) differs from the characterization of the type of shoreline habitat in the original spill modelling appendix (Figure 3-1). The proponent has not provided any explanation as to why this characterization has changed in the revised appendix. DFO has advised that the retention of oil along the shoreline depends in part on habitat type, and it is important to have a clear understanding of shoreline habitat characterization.	Confirm that the characterization of the type of shoreline habitat in Figure 3-1 of the revised appendix is accurate, or provide an updated characterization of shoreline habitat.
IR-63-02C	Multiple VCs – Accidents and Malfunctions	Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions	Revised Section 16	The third paragraph of page C-34 of the revised Section 16 states that the "EL 1144 example well site is located closer to shore than the EL 1150 example well site" (this statement is repeated on page C-35). The fourth paragraph of page C-35 of the revised Section 16 contradicts this statement, and states that "the hypothetical releases at the EL 1144 example well site were deeper [and] farther offshore…than those at the EL 1150 example well site". When discussing qualitative distance from shore, it is unclear whether the shore being referenced is the Canadian coast or the Azores.	Clarify the contradictory statements on pages C-34 and C-35 in the revised Section 16 regarding the relative distances offshore of EL 1144 and EL 1150. Provide clarification on which shoreline is being referenced.
IR-63/64-02	5(1)(a)(i) Fish and Fish Habitat 5(1)(a)(ii) Aquatic Species	Part 2, Section 6.6.1 Effects of Potential Accidents or Malfunctions	Revised Section 16 and Revised Appendix – Trajectory Modelling in Support of the Nexen Energy ULC Flemish Pass Exploration Drilling Project	The Agency required completion of fate and behavior modelling to reflect the worst-case discharge scenario and provision of the rationale for the selection of boundaries for stochastic modeling. In addition, the proponent was required to provide a discussion of the limitations of the truncated spatial extent of the spill dispersion results. In response, the proponent repeated its oil spill modelling based on a longer release duration of 120-days, and a model duration to 160 days, and expanded the model domain to include Canadian, Unites States, other national territorial seas and International waters. As a result of increased release duration, increased volume of oil released, and the larger model domain, the model results predicted a higher potential for oil to reach shorelines. The updated model results predicted shoreline exposure for the Azores, Newfoundland, Labrador, and Nova Scotia. Section 16.4.4.2 of the revised Section 16 indicates that the 120-day model predicted shoreline contact to occur in the Azores from hypothetical releases at both the EL 1144 and EL 1150 example well sites. However, it is not evident if or how other countries may be involved in spill response planning or if they will receive notification in the unlikely event of a spill.	Discuss if and how members of the international community and other countries will be engaged in spill response planning. In the unlikely event of an accidental release of oil, discuss the process for notifying other provinces within Canada or other countries (i.e. Portugal) for which the model predicts shoreline contact.
IR-68-02	Multiple VCs –	Part 2, Section 6.6.1,	Section 16.1.4.3 Potential	In IR-68 the Agency required a discussion of the differences in potential	Discuss differences in potential environmental effects between subsea,

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	Accidents and Malfunctions	Effects of Potential Accidents or Malfunctions	OSRP Tactics	effects between subsea, surface and aerial dispersant application. In its response, the proponent discusses differences between dispersion application methods, including the benefits and goals of various application methods. However, the proponent does not discuss the differences in potential effects between subsea, surface, and aerial dispersant application.	surface and aerial dispersant application.
IR-69/71-02	Multiple VCs – Accidents and Malfunctions	Part 2, Section 6.6.1, Effects of Potential Accidents and Malfunctions	Section 16.1.4.2 Emergency Response Contingency Plans, Well Containment Procedure (Capping Stack)	In IR-69 the Agency required information on the feasibility of options for decreasing capping stack response times, including through potentially establishing a capping stack facility in eastern Canada, shipping a capping stack by air, or having a capping stack available on a vessel for rapid deployment. In its response, the proponent states that, "while the capping stack is being mobilized, there are other integral operations (e.g., site assessment, debris removal, tactical oil spill response measures, replacement MODU mobilized to the region) taking place. Therefore, having a capping stack in closer proximity to the wellsite does not necessarily translate into faster capping times." The proponent also states that "air-freighting is a faster mode of transportation compared to that of sea-freighting, but the faster shipment may not translate into faster capping times for a variety of reasons including availability of the required multi-purpose installation vessel in the region, on-going debris removal operations, need to break down to ship by air and reassemble the capping stack in the region, etc." In IR-71 the Agency required additional information on the steps and timeframes involved in the deployment of subsea incident response equipment. In its response, the proponent provides some information on the sequence and timing of spill response operations. The proponent's response does provide additional information on the schedule for mobilization of a capping stack and the eventual capping of a well, as well as the feasibility for decreasing capping stack response times; however, it is not clear how the proponent reached the conclusion that "a time estimate to perform the previously described operations would be 30 days, which should account for delays", nor has it been clearly demonstrated how having a capping stack in eastern Canada would not help reduce this response time. Furthermore, it is not clear which operations or other factors may delay the capping of the well and how or if mobilization of the capping stack may be one of these limiting factors. The proponent also does not discuss the feasibility or potential for decreasing response times in having a capping stack available on a vessel for rapid deployment.	Discuss the economic and technical feasibility of CNOOC maintaining a capping stack in eastern Canada. Discuss the economic and technical feasibility, as well as the potential decrease in capping stack response times, of having a capping stack available on a vessel ready for rapid deployment while drilling and testing any wells. Provide additional detail on the sequence and estimated timing of spill response operations, including information on which specific prerequisite measures and actions are required prior to installation of the capping stack. This information should provide clarity regarding: how the mobilization of the capping stack fits into other required and parallel steps to cap a well; what are the limiting factors affecting the timeline to cap a well; the breakdown of steps, and timing of those steps, that occur in the estimated 30 day timeline to cap a well; and whether capping stack mobilization and overall capping time could be reduced through establishing a capping stack facility in eastern Canada or shipping a capping stack by air.
IR-72-02	All – Project Description	Part 2, Section 3, Project Description	Section 16.1.4.2 Emergency Response Contingency Plans,	In IR-72 the Agency required information on capping wells in shallow waters. The proponent has not provided information on the technology	Provide information on the technology available to cap a shallow-water well, including information available to support the effectiveness

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	Relevant to All Section 5 Effects		Well Containment Procedure (Capping Stack)	available to cap a shallow-water well. Rather, it states "the current expectation is that all of the proposed ten wells will remain in deeper water (i.e., >500 m). Thus, the need to employ shallow water technologies and techniques does not apply to this project". As the project area covers water depths less than 500 m, all potential emergency response options need to be explored.	of the technology, with respect to the potential shallow depths in the exploration licences. Discuss limitations associated with the use of a capping stack in particular in shallow water environments, including any differences in the steps taken to affix a capping stack in shallow water that may not be required when capping a deep water well (e.g. use of dispersants to reduce flow rate). Explain how the limitations of the technology could affect the length of time it may take to effectively cap a well. If applicable, update the effects analysis to reflect these additional considerations.
IR-75-02	Multiple VCs – Accidents and Malfunctions	Part 2, Section 3.1, Project Components; and 3.2.1, Drilling and Testing Activities	Section 16.4.4.2 Summary of Deterministic Results	In IR-75, the Agency required the proponent to provide additional analysis of the portion of the crude oil that would persist in the environment, including an analysis of the effects of the persistent components on valued components, and possible follow-up monitoring. In response, the proponent provided information on the persistence of crude oil in the environment, but did not provide additional analysis on the effects of the oil on valued components, nor discuss possible follow-up monitoring.	Provide additional analysis of the effects of persistent crude oil on valued components and possible follow-up monitoring related to these effects.

Required Clarifications

Clarification Number	External Reviewer ID	Project Effects Link to CEAA 2012	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Required Clarification
CL-08-02	NRCan-07-Nx		Part 2, 3.1. Project Components and Part 2, 3.2.1. Drilling and Testing and Activities	Section 14.3.7 Greenhouse Gases	NRCan has reviewed the proponent's calculations, and based on the information presented of two wells being tested and 10,000 Mcf of gas and 36,000 bbl flared per well, NRCan has advised that the calculations would be as follows and do not require durations: Example Well Testing CO2 Emission Rate (gas) (10000 Mcf/well)*(1000 cf/MCF)/(35.3 cf/m3)*(2.482 kgCO2/m3)/(1000 kg/tonne)*(2 wells) = 1406.232 tonnes CO2 Emission Rate (oil) (36000 bbl/well)*(158.9873 Litres/bbl)*(2663 g CO2/L)/(1000 g/kg)/(1000 kg/tonne)*(2 wells) = 30,483.588 tonnes Total Well Testing	Review greenhouse gas emissions calculations based on the examples provided by NRCan, and re-calculate emissions as necessary. In addition, confirm that the decision to simply use emission factors for natural gas and oil is conservative when compared to the procedures specific to flaring in the referenced *Guidance Document for Reporting Greenhouse Gas Emissions for Large Industry in Newfoundland and Labrador* (Section 8.3.1.5). **Reference:** Government of Newfoundland and Labrador Office of Climate Change (2017). *A Guidance Document for Reporting Greenhouse Gas Emissions for Large Industry in Newfoundland and Labrador*, March 2017.

					=1406 + 30,484 = 31,890 tonnes	
CL-19-02	DFO-01-Nx	Multiple VCs - Regional Study Area (Accidents and Malfunctions)	Part 1, Section 3.2.3 Spatial and Temporal Boundaries	Section 4.3.1.1 Study Areas	CL-19 required the proponent to update the map and text describing the RSA, taking into consideration spill modelling results. In its response, the proponent explained that it expanded the study area (i.e. model domain) boundaries as part of the revised oil spill modelling, but it did not update the map and text describing the RSA.	Update the map and text describing the RSA, taking into consideration the revised spill modelling results.