ExxoMobil Canada Properties
100 Nw Gower Street
St. Jon's, NL A1C 6K3
Tel: (09) 2731400

ExxonMobil

Candian Ervironmental Assessment Ageicy
Suite200, 1801 Holis Street
Halifx, Nova Scotia
B3J N4
Atterion: Shauna CBrien, Project Manage Atlantic Regional Office

Date: November 20, 2018
File code: 43351.2

DeaMs. O'Brien:

Refeence: Re-submission of the ExxoiMobil Canada Ltd. Eastern Newfoundland Offshore Drilhg Program –Information Requirenents – Additional Round 2

Pleae find enclosel the Information Requirements (IRs) from the Additional Round 2, common to bothExxonMobil Canada Ltd. (ExxonMolil) Eastern Newfoundland Offshore Exploration Drilling Envionmental Impact Statement (EIS) an Equinor Canada Ltd. Flemish Pass Exploration Drilling Projct EIS.

Eleconic copies in pdf and word format have been transmitted electronically.

If yo have any questions regarding the transmittal please contact the undersigned.

Respctfully

<Original Signed
By>

Rhiannon Davis on behalf of

Stephen C. Edwards, P.Eng.
Safey, Security, Health & Environment Manager
ExxoMobil Canada Ltd.
Telehone: 709-273-1810
Ema: stephen.c.edwards@exxonmobil.com

Additional Round 2 Information Requirements

for
Flemish Pass Exploration Drilling Program
(CEAR 80129)

and

Eastern Newfoundland Offshore Exploration Drilling Project
(CEAR 80132)

pursuant to the *Canadian Environmental Assessment Act, 2012*

Equinor Canada Ltd.

ExxonMobil Canada Ltd.

November 2018

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COMMON INFORMATION REQUIREMENTS

EQUINOR AND EXXONMOBIL

INFORMATION REQUIREMENT – IR-16/16A-2B

Additional information on potential habitat use by Atlantic Salmon

The response to IR 16/16a states that Indigenous groups' comments and additional references were incorporated into the updated discussion of potential use of the project area by Atlantic Salmon. Wolastoqey Nation in New Brunswick (WNNB) has advised that unpublished information included in their submission was not addressed. This research has since been published, and WNNB suggests that it 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. The applicable reference is:

> Soto DX, Trueman CN, Samways KM, Dadswell MJ, 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-16/16a response emphasize that sea-surface temperatures in the project area limit the potential for interaction between Atlantic Salmon and the projects.

However, WNNB noted that there are competing statements in the response to IR 16/16a. Part 1 of the response states that low sea-surface temperatures in the project area, especially over winter, will limit the potential for interactions with the projects. Part 3 states that increasing sea-surface temperatures will lower habitat suitability in the project area and limit the potential for interaction. WNNB noted that this would only hold true if sea-surface temperatures increased to and / or above the thermal tolerance of Atlantic Salmon, and that based on EIS Figure 5-71, mean water temperatures in the project area are projected to increase by as much as 2 degrees Celsius, 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 North Atlantic Salmon.

Specific Follow-Up Question/Information Requirement

Taking into account the newly published information submitted by WNNB, provide a discussion of the results of this 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-surface temperatures in the project area and the potential contribution this may make to current and future habitat use trends, taking into consideration the newly published research on sea-surface temperatures and Atlantic Salmon distribution.

Response

ExxonMobil Canada Ltd. (ExxonMobil) and Equinor Canada Ltd. (Equinor) (herein referred to as the Operators) received Information Requirement (IR) IR-16 and IR-16a from the Canadian Environmental Assessment Agency (CEA Agency) on 13-Mar-2018 and 24-Apr-2018, respectively. Responses were submitted to the CEA Agency on 05-Jul-2018 and would have included any new information that was available at this time. As indicated in the comments from the reviewer above, which also aligns with the submission from Wolastoqey Nation in New Brunswick (WNNB) to the CEA Agency (dated 07-Mar-2018), the applicable research was not published at the time of preparing the responses to IR-16 and IR-16a, which were submitted to the CEA Agency on 05-Jul-2018. Since the submittal of IR-16 and IR-16a, the research has been published, which occurred on 09-Aug-2018. A discussion of the Soto et al 2018 paper is outlined below.

Part 1: Taking into account the newly published information submitted by WNNB, provide a discussion of the results of this 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.

The additional literature provided was reviewed and considered with respect to updating the analysis of effects on Atlantic salmon. The information provides supplemental data on marine movements and habitat utilization, particularly by one- (1SW) and multi-sea winter (MSW) salmon, but does not alter the utilization, movement patterns, and previously described distributions within the Environmental Impact Statement (EIS) (refer to Section 6.1.7.4). As described within the EIS, the Project is not likely to result in significant adverse environmental effects on marine fish and fish habitat, including Atlantic salmon. The implementation of mitigation measures, combined with the short-term nature of activities, a deep-water dynamic environment that rapidly disperses marine discharges, and avoidance behaviours of salmon, results in adverse effects that are negligible to low magnitude, short-term, localized and reversible. Further details are provided below.

The paper published by Soto et al (2018) investigated the stable isotope signatures (carbon and nitrogen) of returning adult salmon to the Saint John River, New Brunswick, over a long-time series (approximately 1980-2011) using archived scale samples from Fisheries and Oceans Canada (DFO). Soto et al (2018) compared the carbon isotope (δ13C) signatures in the scales to the known relationship between carbon isotopes at the base of the marine food web (marine algae – which are influenced by sea surface temperature [SST]). Potential marine feeding areas for each marine age (1SW and MSW) of salmon were proposed based on the relative strength of linear correlations between temporal trends of SST and Suess-corrected scale δ13C values. The approach was based on the premise that the extent of carbon isotopic discrimination during photosynthesis by phytoplankton co-varies with temperature such that warmer waters lead to more 13C-enriched particulate organic matter (POM) or higher δ13C values. Therefore, if salmon spend time in different parts of the Atlantic Ocean with different SSTs, they would be consuming food sources with different carbon signatures. The change over time in carbon signature within the scales of salmon can therefore provide an indirect record of the temporal trends in SST experienced by fish during marine feeding. The location of potential feeding areas can be inferred (estimated) through comparisons of temporal trends in fish scale isotopes and SST (measured by remote sensing). In general, the higher the carbon 13C value, the warmer the water where the salmon was feeding.

The study found that MSW salmon from the Saint John River appear to be using different areas to feed than 1SW salmon from the same river. The paper determined that the larger salmon were

travelling and feeding to a greater extent and through various SSTs while the 1SW fish were using the same general SST throughout the entire time series. It was therefore concluded that SST alone cannot explain the declines in salmon returns because both size classes of salmon have been showing similar declines throughout the time series.

Using the data, the paper also concluded that salmon from Saint John River were most closely correlated to several feeding areas; the western North Atlantic (Irminger Sea near Iceland, southwest Greenland or Labrador / Newfoundland), the southern North Sea, and northern Norwegian Sea (see Figure 4 below from Soto et al [2018]) based on the locally estimated scatterplot smoothing fit of average SST and δ13C values; however, the paper suggested the western North Atlantic region described above is the more likely of the three feeding regions. This area (darker green and bluish) is off the coast of Labrador and northern Newfoundland (Labrador Sea area) and does not include the Project Area in terms of higher correlation.

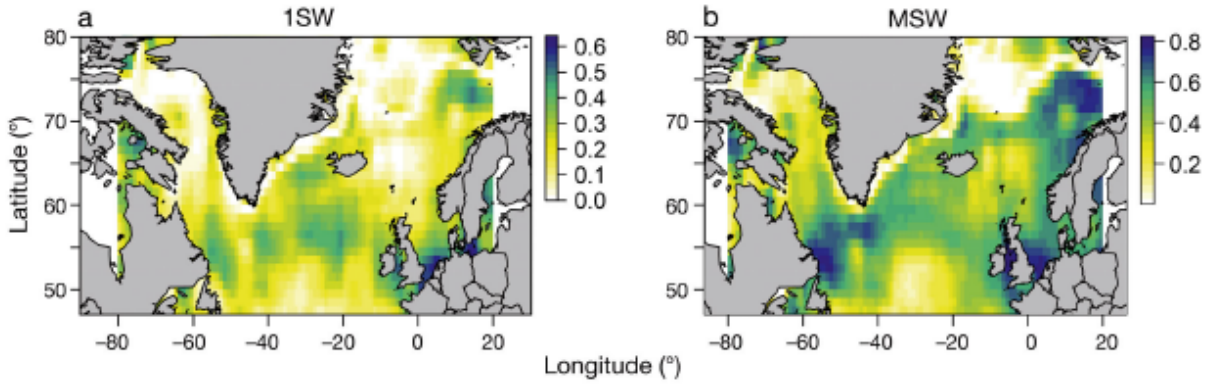


Fig. 4. Probable marine summer feeding locations derived from correlations of LOESS-fit scale $\delta^{13}C$ and yearly median sea surface temperature (SST) for Atlantic salmon after spending (a) 1 winter at sea (1SW) or (b) multiple winters at sea (MSW) and returning successfully to the St. John River during the period 1982–2011. Colours indicate the degree of correlation (R^2)

There are other discussion points in Soto et al (2018) where it is argued that warming in oceanic feeding areas cannot be the principal cause of synchronous population declines in 1SW and MSW salmon returning to the Saint John River. Soto et al (2018) conclude that environmental conditions in early post-smolt environments are more likely than conditions experienced during their time in open-ocean regions after the post-smolt year to cause synchronous population declines experienced by 1SW and MSW returning fish than conditions experienced during their time in open-ocean regions after the post-smolt year. Soto et al (2018) suggests the results support analyses identifying early post-smolt habitats as critical targets for conservation efforts focussed on reducing marine mortality of Atlantic salmon. Soto et al (20108) does not identify the specific areas of focus; however, general migratory pathways of young smolt as they leave their natal stream and migrate toward marine feeding areas are most likely. For Saint John River salmon for example, these would likely include immediate estuary habitat, the Bay of Fundy, south coast of Nova Scotia, and coastal Newfoundland and Labrador, where predation, bycatch, and migration interference could occur.

The limited interaction between salmon migrating within and near the Project Area will most likely remain low, as described in the EIS and associated response to IR-16/16a. As the potential for environmental effects of planned Project activities and overall risk to Atlantic salmon is low, it is predicted that the Project will not contribute to nor exacerbate declines to salmon populations. As a result, the conclusion within the EIS based on existing data remains valid; the Project is not likely to

result in significant adverse environmental effects on marine fish and fish habitat, including Atlantic salmon.

Part 2: Provide clarification on contradictory information regarding sea-surface temperatures in the project area and the potential contribution this may make to current and future habitat use trends, taking into consideration the newly published research on sea-surface temperatures and Atlantic Salmon distribution.

The information provided in the original response to this IR (i.e. IR-16/16a Parts 1 and 3) appears to contain contradictory information and therefore additional clarification is provided below. As outlined in Part 1 of the original IR response, migration routes for Atlantic salmon can change based on environmental conditions such as SST, which can vary considerably within the marine environment. In terms of habitat preferences, it has been shown that avoidance of lower water temperatures, particularly below 3°C (Reddin and Shearer 1987; Reddin and Friedland 1993), can be used as a predictor of habitat use near the Grand Bank and Flemish Pass. Preferred water temperatures range between 4°C to 8°C (Reddin and Friedland 1993).

Predictions related to climate change and ocean-water temperatures were provided in Section 5.8.2.1 of the EIS. Model results were provided for three time-period end-dates; 2050, 2075, and 2100. As with all model predictions, estimates of uncertainty and model agreements (if multiple models are used) provide an indication of the reliability of predictions. Figure 5-70 in the EIS (reproduced as Figure 1 below) shows the level of model agreement and the standard deviation of projected temperature changes of near-surface water (5 to 7 m depths) in the North Atlantic. Areas with cross hatching have 100 percent model agreement (based on an ensemble of seven CMIP5 global climate models) that warming will occur in these areas. The background colours within each model output represent the standard deviation of the magnitude of warming projected, which is a representation of uncertainty. As shown, the models had greater standard deviations and limited agreement within the majority of the Project boundary area, indicating greater uncertainty in the predictions. Figure 5-71 from the EIS (reproduced as Figure 2 below) shows a representative Global Climate Model projection from the same model ensemble used to create Figure 5-70 from the EIS. The predictions indicate that the next several decades (to approximately 2075) will experience near-surface (top 6 m) water temperatures 1°C to 1.5°C warmer than that recorded in 1981-2005.

Statistical summaries of sea temperature were derived for the same rectangular area surrounding the Project Area as that shown in Figures 5-70 and 5-71 of the EIS. Mean SSTs range from 1.6°C in March to 5.3°C in October. Minimum temperatures at the surface range from -1.8°C in January to 1.1°C in August and September. Maximum SSTs range from 4.0°C in March to 11.8°C in August. As shown, mean SSTs values greater than 3°C occur between July and November and the preferred range (4°C to 8°C) can occur between July and October. Minimum SSTs for every month are below 3°C.

Adult salmon typically begin returning to their natal rivers around Atlantic Canada in early June to July and hence, would most likely migrate near / through the Project Area in March – May. A possible increase of up to 1.5°C (as indicated by climate change modelling described above) over the next several decades in these months would increase mean SSTs to 3.1°C, 3.5°C, and 3.6°C for March, April, and May, respectively. Minimum temperatures at the surface would increase to -0.2°C, -0.1°C, and 0.0°C for March, April and May, respectively. Maximum SSTs would be predicted to increase to 5.5°C, 8.1°C, and 10.0°C for March, April and May, respectively.

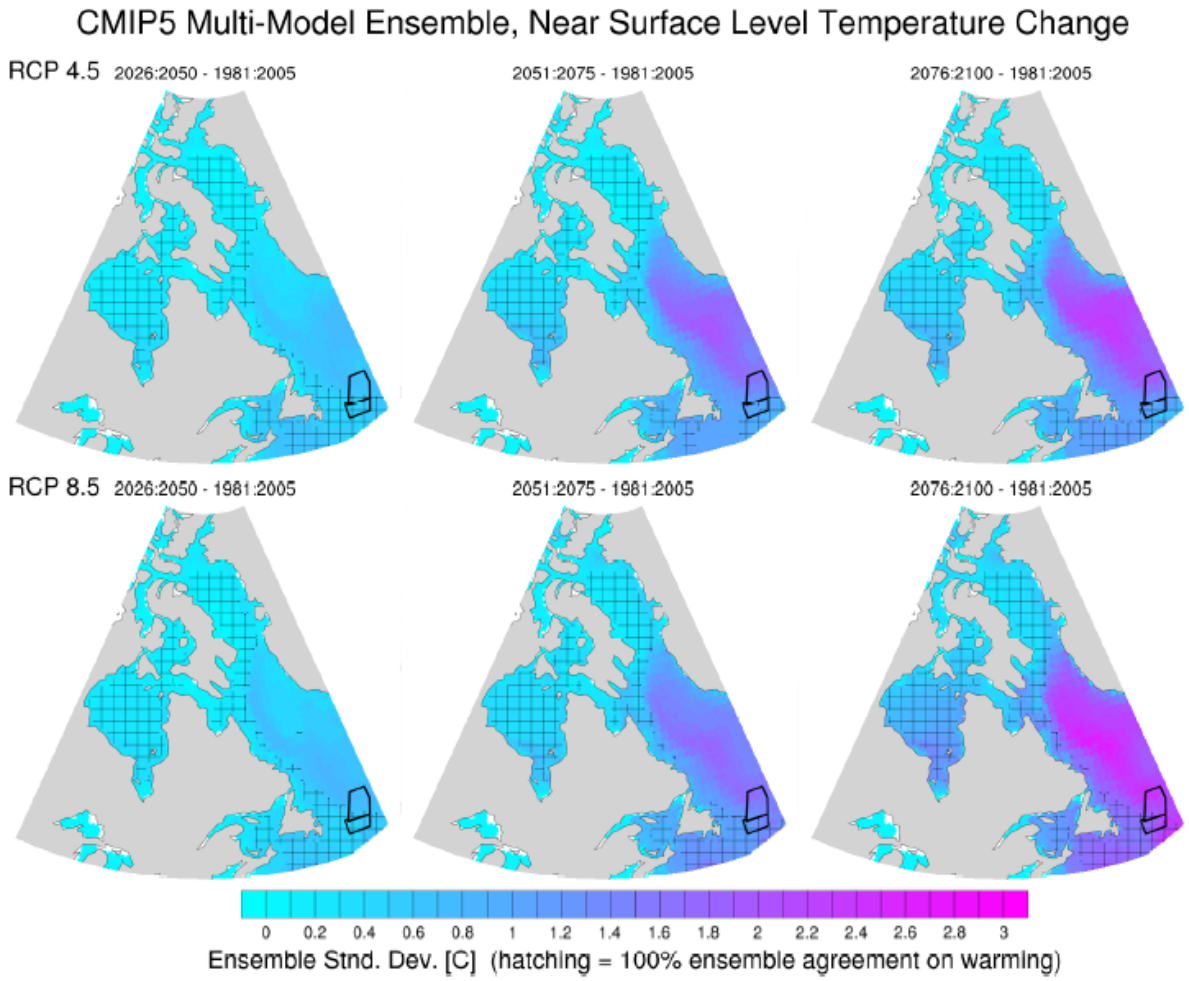


Figure 1 **EIS Figure 5-70: Ensemble Agreement of Project Near-Surface Ocean-Water Temperature Predictions**

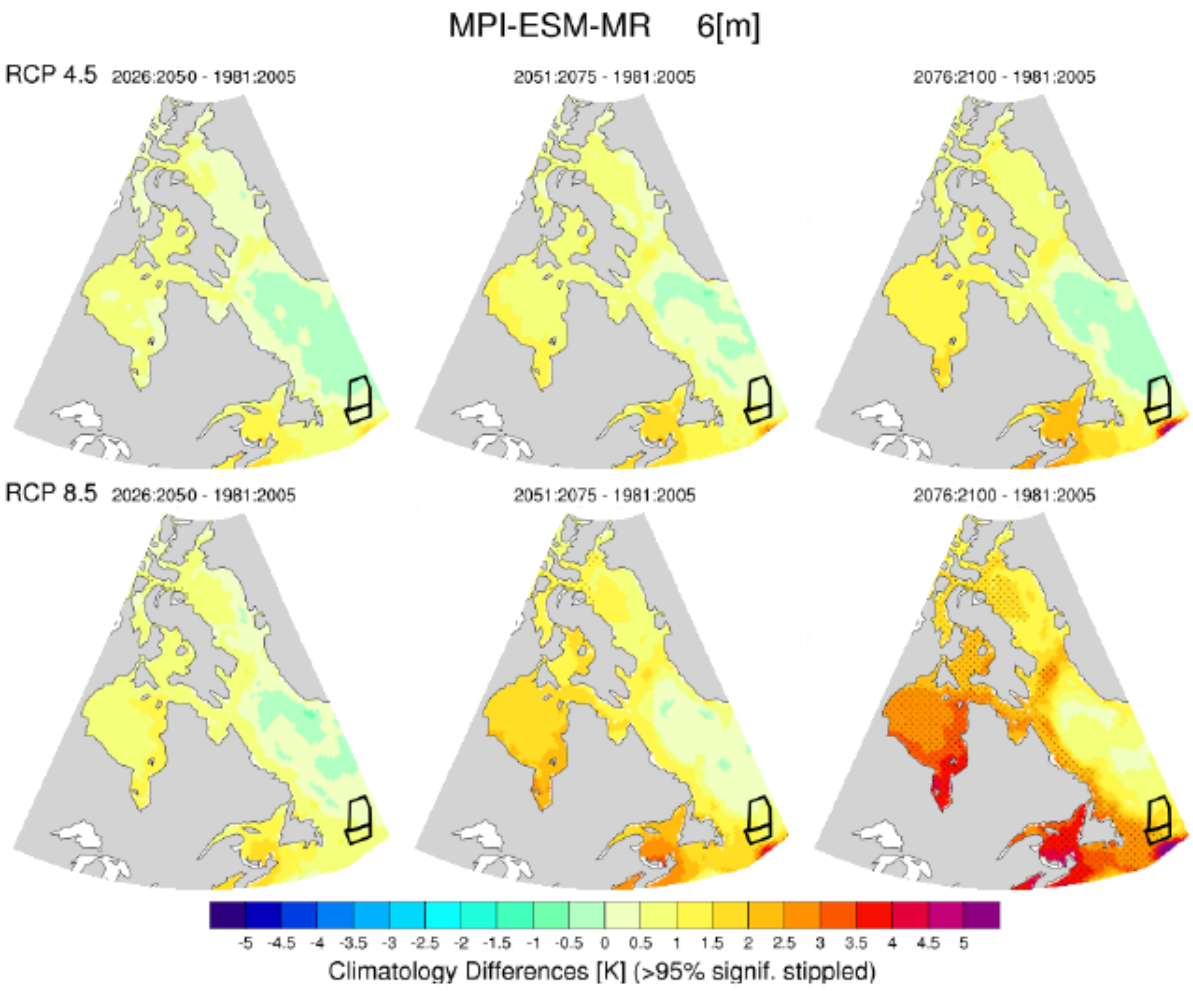


Figure 2 EIS Figure 5-71: Representative GCM Projection at 6 m Depth Ocean Water Temperature Change

As indicated, the mean predicted SSTs are below the preferred range (i.e., lower suitability) but above the temperature known to be physically avoided. Therefore, the statement within the original response to this IR remains unchanged; the limited interaction between salmon migrating within and near the Project Area and those post-smolt and adults feeding north in the Labrador Sea and kelts along the southern edge of the Grand Bank will most likely remain low given the predicted increases in SSTs (i.e., lower suitability) near the Project Area. As the potential for environmental effects of planned Project activities and overall risk to Atlantic salmon is low, it is not predicted that the Project will contribute to or exacerbate declines to salmon populations. As a result, the conclusion within the EIS based on existing data remains valid; the Project is not likely to result in significant adverse environmental effects on marine fish and fish habitat, including Atlantic salmon.

References

Reddin, D.G., and W.M. Shearer. 1987. Sea-Surface Temperature and Distribution of Atlantic salmon in the Northwest Atlantic Ocean. American Fisheries Society Symposium I: 262-275.

Reddin, D.G. and K.D. Friedland. 1993. Marine environmental factors influencing the movement and survival of Atlantic salmon. Pages 79-103 in: [D. Mills editor] Salmon in the Sea and New Enhancement Strategies. Atlantic Salmon Federation, Fishing New Books/Blackwell Publishing, Ontario.

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. Mar. Ecol. Prog. Ser., 601: 203-213. Available at: https://www.int-res.com/abstracts/meps/v601/p203-213/. Accessed October 2018.

INFORMATION REQUIREMENT – IR-59-2

IR-59 required a discussion of the economic and technical feasibility of options for decreasing capping stack response times, taking into consideration: the potential to use other capping stacks, establishing a capping stack facility in eastern Canada, or having a capping stack available on a vessel for rapid deployment. In their response, the proponents indicated that locating a capping stack in Eastern Canada would not reduce the overall installation time. However, the proponents did not refer specifically to the RapidCap TIM Air Mobil Capping Stack, a lighter capping stack that can be transported via aircraft and apparently flown from Houston within 24 hours.

Specific Follow-Up Question/Information Requirement

Discuss any recent or ongoing innovations in capping stack technology and availability, including the Rapid Cap TM Air Mobil capping stack, and their potential application to the projects.

Response

As outlined in Section 15.1.2.2 of the Environmental Impact Statement (EIS), ExxonMobil Canada Ltd. (ExxonMobil) and Equinor Canada Ltd. (Equinor) (herein referred to as the Operators) are members of Oil Spill Response Limited (OSRL), which is the largest international industry-funded cooperative that provides preparedness, response and intervention services (OSRL 2018a). Additionally, the Operators are actively engaged in various industry working groups to support improvements in emergency response planning and technology.

In the unlikely event that well control measures fail to control the well, a capping stack may be required, which is mentioned in Section 15.1.2.2 of the EIS. Through their membership, the Operators would source a capping stack through OSRL. One advantage of the Operators' memberships with OSRL is they have a Global Technical Department that focuses on improving oil spill resources on a global basis (OSRL 2018b), and therefore are aware of recent, ongoing, and upcoming innovations associated with capping stack technology.

OSRL recently developed an Air Freightable Capping System and is now capable of air freighting the OSRL capping stack system (CSS) to the region. However, the Operators' preferred option would be to mobilize the CSS by vessel, which is discussed in Section 15.1.2.2 of the EIS. As outlined in the original response to this Information Requirement (IR), several activities are required to occur prior to installing the CSS on a well, including site assessment / preparation and debris removal.

The Rapid Cap™ capping stack equipment, available through Halliburton, is also capable of air freight transportation. The Operators' assessment concluded that the Rapid Cap™ equipment does not provide incremental benefit relative to the existing CSS available through their membership in OSRL.

Increased logistics associated with air travel and subsequent road transport for vessel load out to port are also of significance. These incremental activities increase the overall complexity of a CSS mobilization and could result in longer mobilization times for the equipment to the well site.

In addition to the above limitations with transporting a CSS by air, if the Rapid Cap™ was available for use, it is not designed to be used with the offset installation equipment that is part of the OSRL system for shallow water depths, which is outlined in ExxonMobil's response to IR-70.

Based on the information above, the Rapid Cap™ equipment and / or transporting the CSS by air offers no advantage over marine transportation. Marine transportation is the preferred method by both Operators.

References

OSRL (Oil Spill Response Limited). 2018a. About Oil Spill Response Limited. Available online: https://www.oilspillresponse.com/about-osrl/. Accessed October 2018.

OSRL. 2018b. OSRL & Industry: Developing, Sharing, Assuring and Outreach. Available online: https://www.oilspillresponse.com/about-osrl/osrl--industry/. Accessed October 2018.

INFORMATION REQUIREMENT – IR-90

Since the EISs were prepared in 2017, additional, reasonably-foreseeable projects and activities have been proposed in the eastern Newfoundland offshore region, including Equinor's Bay du Nord Development Project. The analysis of cumulative effects provided in the EISs and in IR-86 requires updating taking into account new projects and activities.

Specific Information Requirement

Update the assessment of cumulative effects, taking into account taking into account projects and activities that have been proposed since the EISs were prepared.

Response

ExxonMobil Canada Ltd. (ExxonMobil) and Equinor Canada Ltd. (Equinor) (herein referred to as the Operators) did not consider the proposed Bay du Nord (BdN) development project (herein referred to as the proposed BdN project) as reasonably foreseeable at the time the Environmental Impact Statement (EIS) was submitted in December 2017 for the following reasons:

- The proposed BdN project did not meet the definition of "reasonably foreseeable" outlined in a guidance document from the Canadian Environmental Assessment Agency (CEA Agency 2015); Equinor did not submit a project description to the CEA Agency until June 2018 (Equinor 2018);
- The CEA Agency issued a *Notice of Commencement of an Environmental Assessment* for the proposed BdN project in August 2018 (CEA Agency 2018); and
- When the EIS was submitted to the CEA Agency in December 2017, the proposed BdN project did not meet the criteria outlined in a CEA Agency guidance document (CEA Agency 2014).

Based on the aspects above, the cumulative effects assessment included in the EIS is considered complete. However, the proposed BdN project has been taken into consideration from a cumulative effects perspective and the results of that are outlined below.

Cumulative Effects Assessment Limitations and Assumptions

As mentioned above, the EIS associated with the proposed BdN development project is in progress and has not been submitted to CEA Agency, or deemed conformant, therefore information is limited to information contained available to the public (i.e. BdN project description [Equinor 2018]). It is possible that information in the BdN project description may be updated in the BdN EIS.

The proposed BdN project is undertaking several models such as, but not limited to, drill cuttings deposition and underwater sound, however, this information is not finalized and therefore cannot be incorporated into this response.

To consider the proposed BdN project into the cumulative effects assessment, numerous assumptions were made and are identified through this response.

Approach and Methods

The approach and methods outlined in Section 14.1 of the EIS are applicable to this response and remains valid.

Identification of Valued Components

The identified of valued components (VCs) in Section 14.1.1 and Table 14.1 of the EIS are applicable to this response and remains valid.

Spatial and Temporal Boundaries

The spatial and temporal boundaries outlined in Section 14.1.2 of the EIS are applicable to this response and remains valid.

Sources of Potential Cumulative Effects

A list of the other physical activities that were considered in the cumulative effects assessment is provided in Table 14.2 of the EIS and includes on-going and future projects and activities that were certain and/or reasonably foreseeable at the time the EIS was developed. In addition, Figures 14-1 and 14-2 of the EIS displayed these projects and activities for the Project Area – Northern Section and Project Area – Southern Section, respectively.

An overview of the proposed BdN project is outlined in Table 1 below. Figures 1 and 2 (updates to EIS Figures 14-1 and 14-2) have been updated to include the location of the proposed BdN project. The Operators have also taken the opportunity to incorporate general updates to Figures 1 and 2 (e.g. fishing locations, call for bids).

Table 1 Overview of Proposed BdN Project Considered in the Cumulative Effects Assessment

Overview
• Discovered in 2013 and a significant discovery licence was issued in November 2017 (Equinor 2018; C-NLOPB 2018). • The proposed project would be operated by Equinor. • This proposed project has yet to receive sanction by Equinor. • This project is proposed and is currently going through an EA, with a Project Description filed in June 2018 (Equinor 2018) and the CEA Agency issuing a *Notice of Commencement of an Environmental Assessment* in August 2018 (CEA Agency 2018). • If the proposed project is executed, then it will be located approximately 450 kilometres (km) east-northeast of St. John's, Newfoundland and Labrador. • The area associated with the Core BdN project is anticipated to be small and well-defined (i.e. 450 square kilometres [km^2]), while the broader project area has an estimated area of 4,900 km^2 and is associated with potential future development (Equinor 2018). The footprint of proposed facilities on the seabed, based on the current stage of design, only covers an area of approximately 7 km^2 (Equinor 2018). • Approximate distances from the proposed BdN floating production, storage and offloading (FPSO) installation to existing offshore production facilities are as follows: o Hibernia Oilfield – 226 km o Terra Nova Oilfield – 229 km o White Rose Oilfield and Extension Project – 180 km o Hebron Oilfield – 225 km • The proposed BdN project is a subsea development, which may include multiple templates and / or individual satellite wells (between 5 and 10 combined) tied back via flowlines to a FPSO. The total number of wells for the Core Bay du Nord Development is estimated to be between 10 and 30 wells (Equinor 2018).

Overview
• This proposed project is located within the Project Area – Northern Section, and approximately 95 km from the closest edge of the Project Area – Southern Section. • Approximate distances from the proposed BdN project area to closest edge of the Operators' exploration licenses (ELs) are: o EL 1134 – 74 km o EL 1135 – 44 km o EL 1137 – 197 km o EL 1139 – 97 km o EL 1140 – 137 km o EL 1141 – 100 km o EL 1142 – 35 km • A detailed schedule of activities is not available at this time; however, the following is an overview of approximate timing of proposed activities, and this preliminary schedule may change (Equinor 2018): o Pre-installation survey / site preparation – 2020 to 2023 o Offshore construction, installation, hook-up and commissioning – 2023 to 2025 o Drilling – 2023 to 2028 o Production, operations, and maintenance – 2025 to 2045 o Surveys (not continuous) – 2020 to 2045 o Potential future development – up to 2045 o Decommissioning to occur at end of Project life • If the proposed BdN project is executed, then activities would occur throughout the temporal duration of this Project (i.e., 2018 to 2027 for Equinor and 2018 to 2029 for ExxonMobil).

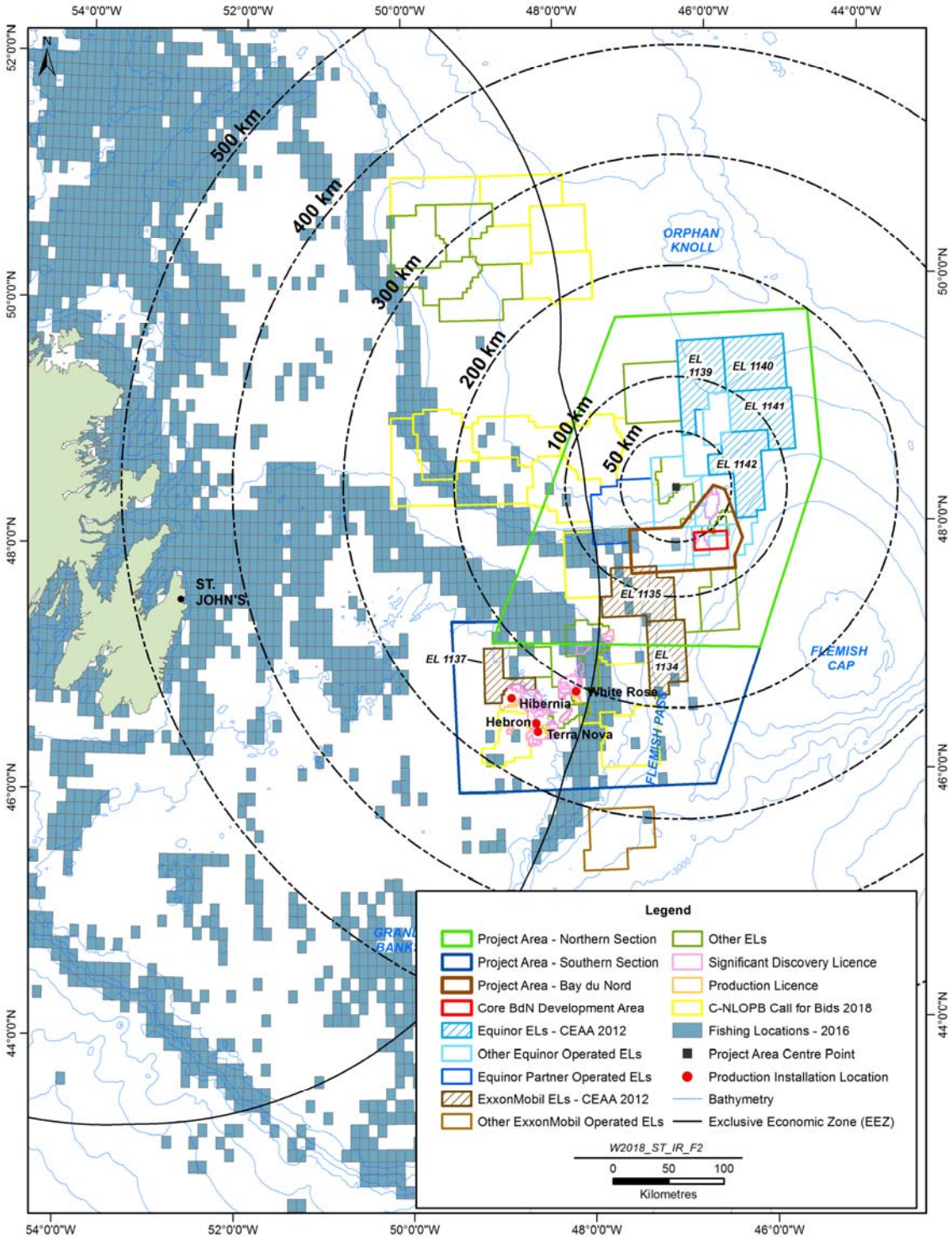


Figure 1 Other Projects, Including Proposed BdN Project, and Activities Considered in the Cumulative Effects Assessment (Including Distances from Project Area – Northern Section)

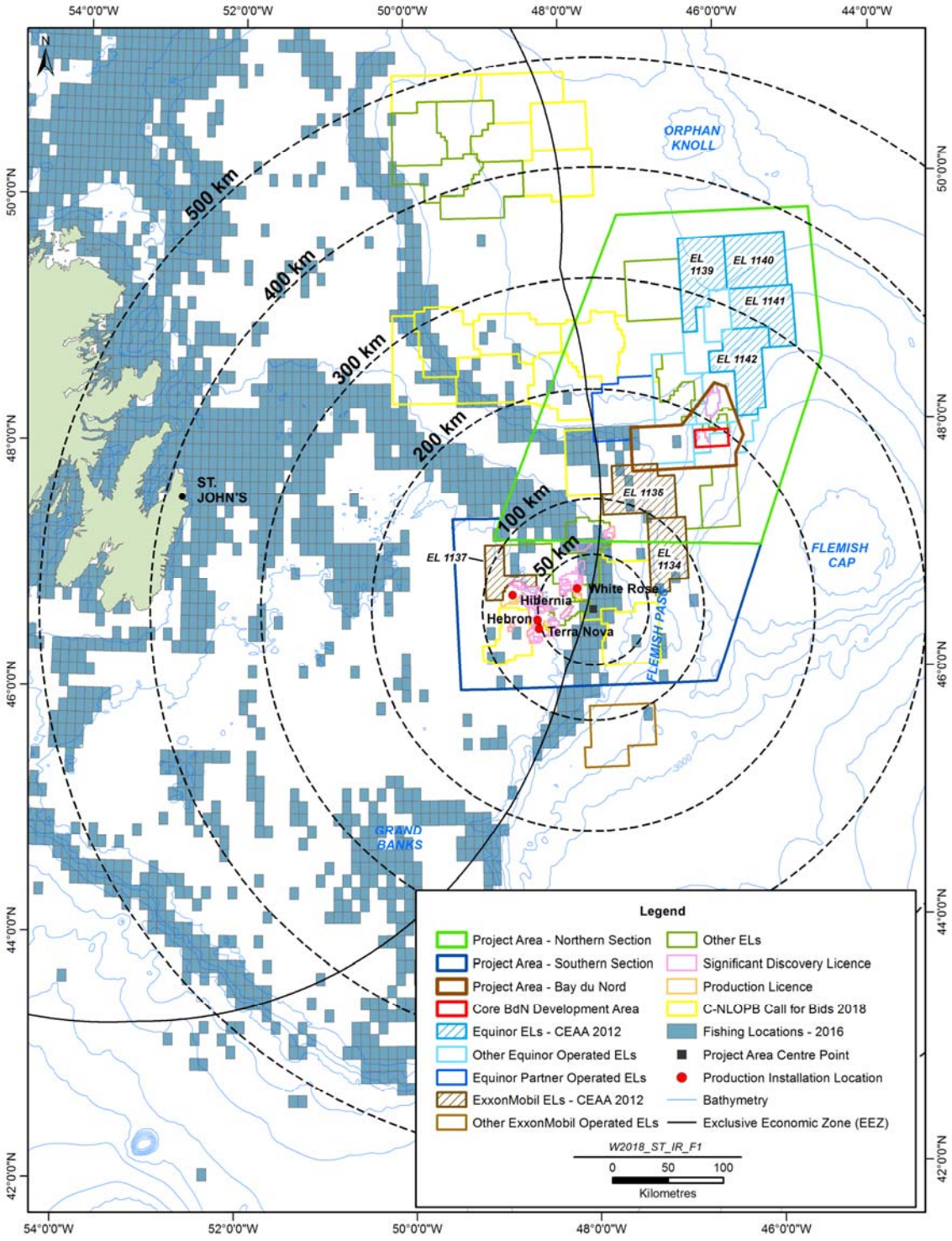


Figure 2 Other Projects, Including Proposed BdN Project, and Activities Considered in the Cumulative Effects Assessment (Including Distances from Project Area – Southern Section)

Assessing Cumulative Effects on Each VC

Table 14.3 of the EIS summarized on-going and future projects and activities that were certain and/or reasonably foreseeable and indicated the VCs potentially affected. Table 2 below outlines the potential VCs that the proposed BdN project may interact with, which are the same as the offshore production facilities.

Table 2 Potential Interactions of the Proposed BdN Project Considered in the Cumulative Effects Assessment

VCs Potentially Affected					
Marine Fish and Fish Habitat	Marine and Migratory Birds	Marine Mammals and Sea Turtles	Special Areas	Indigenous Communities and Activities	Commercial Fisheries and Other Ocean Users
•	•	•	•	•	•

Potential Environmental Interactions

The EIS contains subsections for each of the identified VCs (e.g., Sections 14.2.3, 14.3.3, 14.4.3) and summary tables associated with future projects and activities and potential environmental effects (e.g., Tables 14.4, 14.6, 14.8). Table 3 below outlines the VCs, potential effects and temporal / spatial considerations. Information in Table 3 is limited to that contained in documentation currently available to the public (i.e. the BdN project description [Equinor 2018]. In addition, several assumptions are outlined in the temporal / spatial considerations column of Table 3 which are based on the offshore production facilities and information already contained in applicable VC chapters in the Exploration Drilling EIS.

Table 3 All VCs: Proposed BdN Project and Potential Environmental Effects

VC	Potential Effects	Spatial and Temporal Considerations
Marine Fish and Fish Habitat	• Change in habitat availability and quality • Change in fish mortality / injury risk and fish health • Change in fish presence and abundance	• It is assumed that the effects of the proposed BdN project would be similar to those associated with the Hibernia, Terra Nova and White Rose oilfields (i.e. localized effects outlined in Table 14.4 of the EIS). • Drill cuttings: o Drill cuttings modelling for the proposed BdN is in progress and not finalized, therefore it's not possible to provide the area of drill cuttings deposition at this time. o Total volumes of water-based mud (WBM) and synthetic-based mud (SBM) cuttings that could be discharged is estimated to range from 300 cubic metres (m^3) to 1,000 m^3 per well (Equinor 2018). o As mentioned in Section 8.3.4.1 of the Exploration Drilling EIS, biological effects of WBMs are not normally found beyond approximately 250 metres (m) to 500 m from a drilling installation (Hurley and Ellis 2004; Schaanning et al. 2008; Jorissen et al. 2009; Santos et al. 2009; Trannum et al. 2010; Ellis et al. 2012; Bakke et al. 2013; Deblois et al. 2014). It is assumed that the WBM cuttings associated with the proposed BdN project would be similar. o As mentioned in Section 8.3.4.2 of the Exploration Drilling EIS, the area of biological effect is generally limited to less than one kilometer of the SBM discharge source (Deblois et al 2014; Tait et al 2016). It is assumed that the SBM cuttings associated with the proposed BdN project would be similar.
Marine and Migratory Birds	• Change in mortality / injury levels and health of individuals or populations • Change in avifauna presence and abundance • Change in habitat availability and quality • Change in food availability and quality	• Potential effects associated with the proposed BdN project are assumed to be similar to those associated with the Exploration Drilling Projects and are primarily associated with possible implications for mortality / injury levels and habitat availability / quality due to attraction of night-flying birds to artificial lighting (including flares) and exposure/attraction to emissions and discharges from platforms and vessels (Ellis et al. 2013). • Unlike the Exploration Drilling Project, the proposed BdN project and potential effects would be confined to a fixed location and would be relatively longer-term in nature. There are also potential disturbance effects from planned vessel and aircraft traffic. • It is assumed that proposed non-routine discharges associated with the proposed BdN project would be similar to the active production facilities and may contribute to a change in mortality / injury levels, but these are not anticipated. It is assumed that anticipated routine discharges associated with the proposed BdN project will comply

		with regulation and therefore unlikely to cause measurable change in mortality / injury. There may be a change in food availability due to discharges of organic waste. • As outlined in Section 9.3.3 of the EIS and the response to Information Requirement (IR) IR-86, Poot et al (2008) indicated that birds could be attracted to full lit (30 kilowatts [kW]) oil platforms from up to 5 km; however, attraction from distances greater than 5 km could not be ruled out. As outlined in the response to IR-40-2 and IR-82-2, a recent study indicated that birds from colonies up to 16 km were susceptible to stranding due to light attraction (Rodriguez et al 2014, 2015). • Operational discharges and effects of vessel and aircraft traffic are more localized (Rojek et al. 2007; Hoang 2013), and it is assumed that this would be similar for the BdN project. • The majority of strandings reported by offshore operators occur in September and October, corresponding with the departure of Leach's storm-petrel fledglings from the breeding colonies, and with fall landbird migration (LGL 2017). • Inclement weather conditions (fog, drizzle) are also associated with greater numbers of strandings.
Marine Mammals and Sea Turtles	• Change in mortality or injury (underwater noise) • Change in mortality or injury (vessel strikes) • Change in habitat quality or use (behavioural effects) • Change in food availability or quality Change in health (contaminants)	• The area associated with the safety zone is not indicated in the project description (Equinor 2018), however, a safety zone will be established (Equinor 2018). • Sound emissions: o Underwater sound will be generated as a result of planned BdN project activities, which includes sound generated by the FPSO, drilling installations, vessels and geophysical surveys (Equinor 2018). o Geophysical / geohazard / wellsite and seabed surveys typically take between 5 to 21 days to complete but may be shorter or longer depending on the area to be surveyed and weather / operational delays (Equinor 2018). o 2D/3D/4D seismic surveys may occur over the life of the proposed BdN project (Equinor 2018). – 2D seismic surveys tend to cover relatively large geographical areas and are therefore of relatively short-term duration (Equinor 2018). – 3D seismic surveys are typically more focused and tend to cover smaller geographical areas than 2D seismic surveys (Equinor 2018). – 4D seismic surveys, also known as "time lapse seismic" meaning that successive 3D surveys data sets for the same area are interpreted to define changes in the reservoir over time (Equinor 2018). o Vertical seismic profiling (VSP) surveys may be carried out at any time of year (Equinor 2018). VSP surveys are typically quieter and more localized

		than a survey geophysical survey, and shorter in duration (e.g. taking less than 48 hours per well) (Equinor 2018). o Vessel and helicopter activity will also be a source of sound emissions for the proposed BdN project (Equinor 2018).
Special Areas	• Project-related environmental disturbances and interactions may affect the existing natural or human environments in the area • This in turn may affect the key environmental characteristics and processes that define and distinguish these areas, and thus, affect their overall and underlying characteristics, integrity, and value	• The proposed BdN project area will not overlap or interact directly with any of the existing provincial or federal protection areas on or around the Island of Newfoundland (Equinor 2018; Amec 2014). • The proposed BdN project area does not overlap with any of the Canadian Marine Refuges, Fisheries Closure Areas (FCAs), Ecologically and Biologically Significant Areas (EBSAs) or Preliminary Representative Marine Areas, or internationally identified areas such as Important Bird Areas or World Heritage Sites, that have been identified off eastern Newfoundland and within the Canadian Exclusive Economic Zone (EEZ) (Equinor 2018). • The proposed BdN project area overlaps with portions of several internationally designated special areas off eastern Newfoundland, including: a Convention on Biological Diversity EBSA (Slopes of the Flemish Cap and Grand Bank), a Vulnerable Marine Ecosystem (VME) (Sackville Spur) and Northwest Atlantic Fisheries Organization (NAFO) FCA (Northwest Flemish Cap – 10), for which there are no known prohibitions of marine activities such as those associated with the proposed BdN project (Equinor 2018).
Indigenous Communities and Activities	*Health and Socioeconomic Conditions* • Potential socioeconomic effects on Indigenous fisheries (landings and values) and other marine activities due to biophysical changes (resource availability, distributions, quality), access / interference, damage to equipment or other direct or indirect interactions • Potential interactions with protected or special marine areas and possible associated effects on their human use and value • Planned BdN project activities are not expected to result in any	• The following Newfoundland and Labrador Indigenous groups hold commercial-communal fishing licenses (Equinor 2018; D. Ball, pers comm): o Nunatsiavut Government – Inshore groundfish enterprises licensed to operate in 3KL, and seal licences in Seal Fishing Areas 4-33 (Atlantic-wide). o Innu Nation – Mid-shore enterprise (65 to 100 feet) with a groundfish licence permitting access to a variety of areas (Atlantic-wide) including 3KLMN and an Area 6 (3K) shrimp licence; an inshore enterprise with a mobile gear and fixed gear groundfish licence for 3KL o NunatuKavut Community Council – Multiple inshore enterprises with access to 3KL groundfish; Area 6 (3K) shrimp licences; seal licences allowing access in Seal Fishing Areas 4-33 (Atlantic-wide). o Miawpukek First Nation – Multiple enterprises and licences that give access to 3KL; tuna licences in 3LN; a seal licence for Seal Fishing Areas 4-33; a swordfish licence that includes 3KLMNO.

	changes to the environment that would have an effect on the health of Indigenous peoples. *Physical and Cultural Heritage, or Resources of Historical, Archaeological, Paleontological, or Architectural Significance* • There are no interactions or anticipated changes to these resources as a result of planned BdN project activities in the project area, which is located several hundred kilometres offshore. *Current Use of Lands and Resources for Traditional Purposes* • Planned activities for the BdN project are not anticipated to result in any changes to the environment that would have an effect on the current use of land and resources for traditional purposes by Indigenous peoples other than commercial-communal fisheries and associated socioeconomic interactions (discussed above) give the project area's water depth and distance from the nearest Indigenous community. • There are no documented food, social or ceremonial licenses within or near the BdN project area.	o Qalipu Mi'kmaq First Nation Band – An inshore enterprise with a groundfish licence for 3K; a shrimp licence for Area 6 (3K); pelagic fishery access (herring, mackerel, and capelin) which occurs close to shore in 3KL; a snow crab licence for Area 4 (3K). o Several First Nations communities and councils in the Fisheries and Oceans Canada (DFO) Maritimes and Gulf Regions hold commercial-communal licences for swordfish in NAFO Divisions 3, 4, and 5. However, DFO geospatial data (2010-2016) indicates no landings for swordfish in or around the project area over that period.
Commercial Fisheries and	• Direct interference, resulting in a change in the distribution, intensity,	• Production associated with the proposed BdN project is assumed to be year-round for the life of the proposed project,

Other Ocean Users	and/or effectiveness / efficiency of commercial fishing and other ocean uses • Damage to fishing gear, vessels, and other equipment and components	• A safety zone will be established around the proposed BdN project (Equinor 2018). • Refer to the Marine Fish, Fish Habitat and Aquatic Species component regarding interactions with special areas.

Marine Fish and Fish Habitat (including Species at Risk)

Potential Cumulative Environmental Effects

The information outlined in Section 14.2.4 of the EIS is applicable to this response and remains valid.

Project Area – Northern Section

The information outlined in Section 14.2.4.1 of the EIS is applicable to this response and remains valid. The proposed BdN project is located within the Project Area – Northern Section. It I assumed that the proposed BdN project will have similar effects as the offshore production facilities (i.e. localized – less than 10 km). This suggests a limited potential for cumulative effects to occur between the Northern Section of the Exploration Drilling Project Area and the proposed BdN project.

Project Area – Southern Section

The information outlined in Section 14.2.4.2 of the EIS is applicable to this response and remains valid. The proposed BdN project is located approximately 95 km from the closest edge of the Project Area – Southern Section, and therefore it is not anticipated that cumulative effects will occur between the Southern Section of the Exploration Drilling Project Area and the proposed BdN project.

Species at Risk

The information outlined in Section 14.2.5 of the EIS is applicable to this response and remains valid.

Cumulative Effects Summary

The information outlined in Section 14.2.6 of the EIS is applicable to this response and remains valid. The Exploration Drilling Projects are not anticipated to result in significant adverse cumulative environmental effects on Marine Fish and Fish Habitat (including species at risk) in combination with other projects and activities that have or will be carried out, including the proposed BdN project.

Marine and Migratory Birds (including Species at Risk)

Potential Cumulative Environmental Effects

The information outlined in Section 14.3.4 of the EIS is applicable to this response and remains valid.

Project Area – Northern Section

The information outlined in Section 14.3.4.1 of the EIS is applicable to this response and remains valid. The proposed BdN project is located within the Project Area – Northern Section, however, the closest EL is approximately 35 km away. There is the potential for cumulative effects to result from the combined effects of the Exploration Drilling Projects and the proposed BdN project. The potential for cumulative effects to occur will reduce taking into consideration the short-term duration of exploration drilling activities and the assumed localized effects of the proposed BdN project and the Exploration Drilling Projects.

Project Area – Southern Section

The information outlined in Section 14.3.4.2 of the EIS is applicable to this response and remains valid. The proposed BdN project is located approximately 95 km from the closest edge of the Project Area – Southern Section, and therefore it is not anticipated that cumulative effects will occur between the Southern Section of the Exploration Drilling Project Area and the proposed BdN project.

Species at Risk
The information outlined in Section 14.3.5 of the EIS is applicable to this response and remains valid.

Cumulative Effects Summary
The information outlined in Section 14.3.6 of the EIS is applicable to this response and remains valid. The Exploration Drilling Projects are not anticipated to result in significant adverse cumulative environmental effects on Marine and Migratory Birds (including species at risk) in combination with other projects and activities that have or will be carried out, including the proposed BdN project.

Marine Mammals and Sea Turtles (including Species at Risk)

Potential Cumulative Environmental Effects
The information outlined in Section 14.4.4 of the EIS is applicable to this response and remains valid.

Project Area – Northern Section
The information outlined in Section 14.4.4.1 of the EIS is applicable to this response and remains valid. The proposed BdN project is located within the Project Area – Northern Section, however, the closest EL is approximately 35 km away. There is the potential for cumulative effects to result from the combined effects of the Exploration Drilling Projects and the proposed BdN project. The potential for cumulative effects to occur will reduce taking into consideration the short-term duration of exploration drilling activities and the assumed localized effects of the proposed BdN project and the Exploration Drilling Projects. The overall mobility of marine mammal and sea turtle species, along with the availability of alternative habitats during short periods of Project-related disturbance, also helps limit the potential for cumulative effects to occur

Project Area – Southern Section
The information outlined in Section 14.4.4.2 of the EIS is applicable to this response and remains valid. The proposed BdN project is located approximately 95 km from the closest edge of the Project Area – Southern Section, and therefore it is not anticipated that cumulative effects will occur between the Southern Section of the Exploration Drilling Project Area and the proposed BdN project.

Species at Risk
The information outlined in Section 14.4.5 of the EIS is applicable to this response and remains valid.

Cumulative Effects Summary
The information outlined in Section 14.4.6 of the EIS is applicable to this response and remains valid. The Exploration Drilling Projects are not anticipated to result in significant adverse cumulative environmental effects on Marine Mammals and Sea Turtles (including species at risk) in combination with other projects and activities that have or will be carried out, including the proposed BdN project.

Special Areas

Potential Cumulative Environmental Effects
The information outlined in Section 14.5.4 of the EIS is applicable to this response and remains valid.

Project Area – Northern Section
The information outlined in Section 14.5.4.1 of the EIS is applicable to this response and remains valid. The proposed BdN project is located within the Project Area – Northern Section. As indicated in Table 3, the project area associated with the proposed BdN project overlaps with three special areas.

Various planning and mitigation measures such as pre-drill coral and sponge surveys will be used to identify sensitive areas and applicable mitigation measures (Chapter 8). Other activities in the Exploration Drilling Project Area that result in noise, light, emissions and effluents are relatively short-term and localized disturbances with low environmental effects.

Project Area – Southern Section
The information outlined in Section 14.5.4.2 of the EIS is applicable to this response and remains valid. The proposed BdN project is located approximately 95 km from the closest edge of the Project Area – Southern Section, and therefore it is not anticipated that cumulative effects will occur between the Southern Section of the Exploration Drilling Project Area and the proposed BdN project.

Cumulative Effects Summary
The information outlined in Section 14.5.5 of the EIS is applicable to this response and remains valid. The Exploration Drilling Projects are not anticipated to result in significant adverse cumulative environmental effects on Special Areas in combination with other projects and activities that have or will be carried out, including the proposed BdN project.

Indigenous Communities and Activities

Cumulative Effects Summary
The information outlined in Section 14.6.3 of the EIS is applicable to this response and remains valid. The Exploration Drilling Projects will not result in residual environmental effects on Indigenous Communities and Activities, taking into consideration information outlined in Section 14.6.2 of the EIS, and will therefore not result in or contribute to cumulative effects to this VC.

Commercial Fisheries and Other Ocean Users

Potential Cumulative Environmental Effects
The information outlined in Section 14.7.4 of the EIS is applicable to this response and remains valid.

Project Area – Northern Section
The information outlined in Section 14.7.4.1 of the EIS is applicable to this response and remains valid. The proposed BdN project is located within the Project Area – Northern Section, however, the closest EL is approximately 35 km away. While the proposed BdN project may have its own effect on commercial fishing activity, such as the creation of a safety zone and vessel traffic, it is not anticipated that effects on commercial fishing activity and other marine users from the proposed BdN project will interact cumulatively with potential environmental effects of the Exploration Drilling Projects.

Project Area – Southern Section
The information outlined in Section 14.7.4.2 of the EIS is applicable to this response and remains valid. The proposed BdN project is located approximately 95 km from the closest edge of the Project Area – Southern Section, and therefore it is not anticipated that cumulative effects will occur between the Southern Section of the Exploration Drilling Project Area and the proposed BdN project.

Cumulative Effects Summary
The information outlined in Section 14.7.5 of the EIS is applicable to this response and remains valid. The Exploration Drilling Projects are not anticipated to result in significant adverse cumulative environmental effects on Commercial Fisheries and Other Ocean Users in combination with other projects and activities that have or will be carried out, including the proposed BdN project.

Summary of Potential Cumulative Environmental Effects

Table 4 outlines a summary of potential cumulative effects taking into consideration the proposed BdN project, as well as the numerous assumptions made throughout this response.

The Exploration Drilling Projects are not anticipated to result in significant adverse cumulative environmental effects on VCs in combination with other projects and activities that have or will be carried out, including the proposed BdN project.

Table 4 Summary of Potential Cumulative Effects Taking into Consideration Proposed BdN Project

VC	Potential for Interaction with Effects of Project: Northern Section	Potential for Interaction with Effects of Project: Southern Section
Marine Fish and Fish Habitat	Y - Some potential for interaction as proposed activities associated with the BdN project are located within the Exploration Drilling Project Area – Northern Section, and adjacent to ELs where exploration activity may occur (distances range from approximately 35 km to 197 km). In addition, exploration drilling activities are short-term and will implement mitigation measures, which will reduce potential for interaction.	N – Proposed activities associated with the BdN project would be located 95 km from the closest edge of the Exploration Drilling Project Area – Southern Section.
Marine and Migratory Birds	Y – Some potential for interaction as proposed activities associated with the BdN project are located within the Exploration Drilling Project Area – Northern Section, and adjacent to ELs where exploration activity may occur (distances range from approximately 35 km to 197 km). In addition, exploration drilling activities are short-term and will implement mitigation measures, which will reduce potential for interaction.	N – Proposed activities associated with the BdN project would be located 95 km from the closest edge of the Exploration Drilling Project Area – Southern Section.
Marine Mammals and Sea Turtles	Y –Although EL distances range from 35 km to 197 km, there is potential for some interaction. However, exploration drilling activities are temporary and short-term in duration, which will reduce potential for interaction.	N – Proposed activities associated with the BdN project would be located 95 km from the closest edge of the Exploration Drilling Project Area – Southern Section.
Special Areas	Y – There are special areas that overlap select Exploration Drilling Project ELs and the proposed BdN project. However, the closest Exploration Drilling Project ELs are located approximately 35 km and 44 km from the proposed BdN project. In addition, exploration drilling activities are short-term and will implement mitigation measures, which will reduce potential for interaction.	N – Proposed activities associated with the BdN project would be located 95 km from the closest edge of the Exploration Drilling Project Area – Southern Section.
Indigenous Communities and Activities	N – The Exploration Drilling Project will not directly affect Indigenous Communities and Activities.	N – The Exploration Drilling Project will not directly affect Indigenous Communities and Activities.

Additional Round 2 Information Requirements
INFORMATION REQUIREMENT – IR-90

VC	Potential for Interaction with Effects of Project: Northern Section	Potential for Interaction with Effects of Project: Southern Section
Commercial Fisheries and Other Ocean Users	Y – Some potential for interactions as the proposed BdN project is located within the Exploration Drilling Project Area – Northern Section; In addition, exploration drilling activities are short-term and will implement mitigation measures, which will reduce potential for interaction.	N – Proposed activities associated with the BdN project would be located 95 km from the closest edge of the Exploration Drilling Project Area – Southern Section.

Mitigation

Information in Section 4.1.5 of the EIS is applicable to this response and remains valid. Taking into consideration the proposed BdN project, no additional or revised mitigation measures are required or proposed.

Monitoring and Follow-up

Information in Section 14.8 of the EIS is applicable to this response and remains valid. Taking into consideration the proposed BdN project, no additional or revised monitoring or follow-up is required or proposed.

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INFORMATION REQUIREMENT – IR-91

Clarification is required on the number of exploration wells and delineation wells associated with each Designated Project. In the event that the projects are approved by the Minister, the Decision Statement for each project will clearly state the maximum number of wells included in that Designated Project. Wells that could be drilled outside the specific exploration licences (ELs) associated with each Designated Project would not be included in the Decision Statement and Ministerial approval, nor the in Agency's analysis of potential environmental effects.

The Environmental Impact Statements (EIS) indicated a total of 35 wells for ExxonMobil's project and 30 wells for Equinor's project. The EISs defined a large project area that encompassed not only the ELs associated with each Designated Project, but also other licences held by both proponents where drilling may take place over the course of the Designated Projects. This other drilling activity would be outside the scope of CEAA 2012 and thus approved under other regulatory processes. The portion of the 30 or 35 estimated wells that could be located on these other licences was not defined; hence the Agency issued IR-66 and IR-71 to clarify the number of exploration wells and delineation wells that could be drilled within and outside of the ELs associated with the Designated Projects.

The IR-66 and IR-71 responses estimated a maximum of 5 exploration wells per EL for ExxonMobil, and likely one to two exploration wells per EL for Equinor. Neither response specified a number or location for delineation wells, owing to the speculative nature of such estimates.

In the recently submitted EIS Addendum from ExxonMobil, the following statement was made regarding number of wells:

> "The total number of exploration/delineation [emphasis added] wells that could be drilled in the Eastern Newfoundland Offshore Drilling project is 35. These 35 wells would include up to 5 on each of EL 1134, EL 1135 and EL 1137 (for a total of 15). The additional 20 wells were included in the event that ExxonMobil were to become operators of EL's in which they are co-venturers but do not operate or in the event that additional ELs were acquired in this project area. Should either situation occur ExxonMobil may request that CEAA consider an addendum to the Eastern Newfoundland Offshore drilling Project. By including the maximum number of 35 wells, ExxonMobil believes it would not be changing the number of wells for the initial scope of the Project."

This indicates that 20 of the wells included in ExxonMobil's EIS analysis are actually outside the scope of the Designated Project, since they would be drilled on licences other than EL 1135, 1137 and 1134. It also characterizes the potential 15 wells on EL 1134, EL 1135 and EL 1137 as exploration/delineation wells, rather than specifically exploration wells. As the IR responses pointed out, the two types of wells have identical environmental effects; however, this distinction is of importance to the Agency from a procedural perspective rather than an environmental one.

Specific Information Requirement

With respect to ExxonMobil, the Agency requests confirmation that the Designated Project for Eastern Newfoundland Offshore Exploration Drilling Project on ELs 1134, 1135 and 1137 would

include up to 15 wells. The Agency also requests clarification on whether this 15 well estimate includes delineation wells, as the response to IR-66 is inconsistent with the information cited above from the EIS Addendum.

With respect to Equinor, the Agency requests clarification on whether the 30 well estimate in the EIS would include wells that could be drilled outside of ELs 1139, 1140, 1141 and 1142. The Agency further requests confirmation that the Designated Project for the Flemish Pass Exploration Drilling Project on ELs 1139, 1140, 1141 and 1142 would include up to 8 exploration wells (1-2 per EL as indicated by the IR responses).

Response

The *Regulations Designating Physical Activities* (Government of Canada [GOC] 2014) contain a Schedule that outlines the designated projects applicable under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Section 10 of the Schedule states "*The drilling, testing and abandonment of offshore exploratory wells in the first drilling program in an area set out in one of more exploration licenses issued in accordance with the Canada-Newfoundland and Labrador Atlantic Accord Implementation Act or the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act.*" (GOC 2014).

The definition of exploration well is outlined in the following:

- *Canada Petroleum Resources Act (GOC 2016) – "exploratory well means a well drilled on a geological feature on which a significant discovery licenses has not been made".*
- *Regulations Designating Physical Activities (GOC 2014) – "exploratory well has the same meaning as in subsection 10(1) of the Canada Petroleum Resources Act, but does not include a delineation well or development well as those terms are defined in that subsection".*

Based on Section 10 of the Schedule (GOC 2014) and the exploratory well definitions above (GOC 2014, 2016), it is understanding of ExxonMobil Canada Ltd. (ExxonMobil) and Equinor Canada Ltd. (Equinor) (herein referred to as the Operators) that the scope of CEAA 2012 Environmental Assessment approval is limited to the first exploration well associated with a drilling program. Wells that are drilled following the first exploration well would fall under the jurisdiction of the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB). However, the Operators have provided guidance regarding the number and type of wells in the response below.

ExxonMobil indicated in the response to Information Requirements (IRs) IR-66 and IR-20-2 that the number of exploration wells that could be drilled on Exploration Licences (ELs) 1135 and 1137 may be up to five on each EL. ExxonMobil recognizes that EL 1134 was not discussed in the responses to IR-66 and IR-20-2; however, five exploration wells may be drilled on that EL as well. Equinor indicated in the responses to IR-71 and IR-20-2 that the number of exploration wells that could be drilled on ELs 1139, 1140, 1141, and 1142 may be up to two on each EL. However, the Operators indicated in the responses to IR-66 and IR-71 that there is much uncertainty to the number, location, and type (i.e., exploration or delineation) of wells. It is therefore not possible to state with any certainty the numbers of each type of well that may be drilled; the results of a single well can change the

geological understanding of the basin, and subsequently the exploration plans for that basin and the ELs in question.

Equinor's 30-well estimate in the Environmental Impact Statement (EIS) includes wells that could be drilled outside of ELs 1139, 1140, 1141, and 1142. As mentioned by the reviewer, these wells would be approved under other regulatory processes.

As mentioned above, ExxonMobil and Equinor could drill up to five and two wells on each EL, respectively; however, there is the possibility that the number of exploration wells could exceed these values due to the well classification, which is determined by the C-NLOPB during the *Approval to Drill a Well* process (C-NLOPB 2011). An example that illustrates this point is Equinor's previous drilling programs on EL 1112; the C-NLOPB classified all six wells as exploration wells, which is reflected in the Schedule of Wells (C-NLOPB 2018). These drilling programs resulted in Equinor obtaining a significant discovery license and the proposed Bay du Nord Development project (C-NLOPB 2018; Equinor 2018). While it is uncommon for the C-NLOPB to classify all wells as exploration wells, it has occurred.

As noted above, as many as six exploration wells have been drilled on one EL. The example given in the response to IR-20-2 was a more likely scenario but as noted, is not necessarily the case for all ELs; there is a range of the number of wells drilled that may occur. Committing to a precise number of wells for a particular license at this early planning stage would add regulatory uncertainty and potentially impede the appropriate exploration and delineation of resources in the EL. Flexibility is required by the Operators to efficiently evaluate the ELs, as a range of one to six exploration wells per EL is possible, based on historic data.

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