COMMENTS PREPARED BY SIERRA CLUB CANADA FOUNDATION ON THE ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE BAY DU NORD DEVELOPMENT PROJECT

I. Introduction

Sierra Club Canada Foundation empowers people to be leaders in protecting, restoring and enjoying healthy and safe ecosystems. We are a grassroots organization with a "think globally, act locally" philosophy. Members are encouraged to actively contribute to environmental causes that engage or inspire them, in a capacity that best suits their capabilities. We have four regional Chapters and a youth-led Chapter, Sierra Youth. The Sierra Club's Atlantic Canada Chapter works through education and action to green the economy and protect the environment. We engage in projects designed to connect children to nature, protect wildlife and wild spaces, and to offer solutions to climate change.

Involvement in the Environmental Assessment for the Bay du Nord Production Project

Sierra Club Canada Foundation has worked for decades to protect marine ecosystems, endangered species, and coastal communities from the negative impacts of oil and gas exploration and development. Our activities have focussed on policy solutions, research, advocacy, coalition building, education and outreach.

Our organization was instrumental in the creation of the 1992 Canadian Environmental Assessment Act and has engaged in advocacy to improve environmental impact assessment in Canada, including offshore oil and gas projects. Most recently, we provided input into the drafting of the new Impact Assessment Act (IAA) that came into force in August 2019. We also engaged in the regional assessment for exploration drilling off Newfoundland (2019-2020) and are currently challenging the validity of that process and the regulation that exempts exploration drilling from impact assessment within the regional assessment area.

Our submission to this opportunity for public participation in the environmental assessment of the Bay du Nord Development Project will focus primarily on the following areas:

- the proponent's approach to evaluating impacts;
- accurately and adequately assessing GHG emissions associated the project;
- potential markets for oil product; and
- oil spill preparedness and proposed response.

PART 1: Approach to Evaluation of Impacts, GHG and Other Air Emissions, and Markets

I. The proponent's approach to evaluating impacts for Bay du Nord is problematic

In parts of the EIS, including those concerning atmospheric emissions, the proponent relies substantially on information and statistics gleaned from the existing oil and gas productions projects in the NL offshore area. SCCF asserts, however, that due to the uniqueness of this project, estimates of its environmental impacts cannot and should not be extrapolated from other offshore projects in Canada. As we have indicated above, the Bay du Nord Development Project would involve several "first time" moments in Canada's offshore industry. First, all existing offshore oil production projects involve drilling in water depths of less than 120 metres, the Bay du Nord project will drill in water depths up to 1200 metres.[1] All the existing production projects are located in the shallower, Jeanne d'Arc Basin, while the Bay du Nord development project would be Canada's first in a new basin: the much deeper Flemish Pass basin.

Deepwater projects bring new challenges (e.g., greater distance to equipment if problems development, greater water pressure, etc), and along with those, new risks. A 2013 study of offshore oil and gas production in the Gulf of Mexico from 1996 to 2010 found that the probability of a serious accident, explosion or fire on an offshore production rig increases by 8.5% with every additional 100 feet of depth at which the platform operates.[2] In addition to a host of other problems and possible catastrophes, deepwater oil and gas rig accidents could, potentially, result in serious GHG and other atmospheric emissions.

Second, existing production projects are within Canada's 200-mile *exclusive economic zone* (*EEZ*), but the Bay du Nord "Core" area is outside the 200-mile limit, which requires a more careful consideration of requirements under international conventions, such as *the UN Convention on the Law of the Sea*, to which Canada is a party.[3]

In addition to the problems arising from the shallow/deep basin distinction, there are several other problems with the proponent's approach. First, despite a requirement in the EIS guidelines that the proponent consider carefully the impact of severe weather and climactic conditions, we see very little information in the EIS that shows an attempt to take into account more extreme weather events affecting the North Atlantic as climate change impacts grow larger. The proponent must provide a careful assessment of potential impacts on all aspects of the project development and operations in light of the well-known predictions that storm activity will increase. Second, the ranges for the number of production and injection wells are very large (10-40), thus the proponent must provide more details on impacts at both the low and high ends of this range.

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[1] https://www.gov.nl.ca/nr/files/energy-petroleum-offshore-projects-oil-and-gas-comparison-july-2018.pdf

[2] L. Muehlenbachs, M.A. Cohen & T. Gerarden, "The impact of water depth on safety and environmental performance in offshore oil and gas production", *Energy Policy*, Vol 55, April 2013, 699-705, https://www.researchgate.net/publication/257126545_The_impact_of_water_depth_on_safety_and_environmental_performance_in_offshore_oil_and_gas_production.

[3] Canada ratified this Convention in 2003.

II. Decision to treat of atmospheric emissions as not a "valued component" is unacceptable

SCCF asserts that the proponent's approach to atmospheric emissions deviates in unacceptable ways from the EIS Guidelines issued for the Bay du Nord project, particularly in its decision to exclude "air quality and greenhouse gas emissions" as a valued component (VC). In the Summary of the EIS, the proponent admits to the exclusion of "air quality and greenhouse gas emissions" as a VC in s. 7.1:

> "The EIS Guidelines lists "air quality and greenhouse gas emissions" as a suggested VC that may be considered in the EIS. These components have not been considered as an individual VC; but rather aspects of the atmospheric environment were addressed as part of the overall discussion of potential Project-related environmental emissions and their management." (our emphasis).

As governments at all levels around the world try to cope with how they will manage the enormous social and economic costs of climate change associated with problems like worsening wildfires, drought, flooding and extreme weather events, it is simply unacceptable for the proponent to exclude "air quality and greenhouse gas emissions" as a valued component. The proponent simply must do better: it must treat these atmospheric emissions as a full-fledged valued component for the purpose of the EIS.

Cumulative impacts analysis of atmospheric emissions is lacking

As a direct result of the proponent's decision to exclude "air quality and greenhouse gas emissions" as a valued component, the Cumulative Environmental Effects section of the EIS (chapter 15) contains virtually no information on the assessment of atmospheric emissions in a cumulative impacts context. To recall, CEAA 2012, section 19(1) requires that an EIS contain an assessment and evaluation of the cumulative environmental effects that are likely to result from the proposed project in combination with other projects or activities that have been or will be carried out (such as, for example, other oil and gas exploration projects in the vicinity of the project). Furthermore, the proponent is required to discuss the significance of these potential effects.

The proponent has undertaken none of this, by virtue of its decision to exclude atmospheric emissions as a VC and also its reference to an "escape hatch" in section 7.6.3 of the EIS Guidelines that allows the proponent to omit from the cumulative effects assessment "VCs that would not be affected by the project or would be affected positively by the project." Needless to say, neither of these conditions apply to the topic of greenhouse gases and other air emissions in relation to offshore oil and gas projects.

III. Greenhouse gas and other atmospheric emissions impacts

In the past few years, an increasing amount of study and attention has been placed on the fact that the oil and gas sector appears to account for a greater proportion of greenhouse gas (GHG) and other atmospheric emissions than previously thought. While most of the focus to date has concerned onshore oil and gas extraction and production operations, the offshore oil and gas sector has now begun to attract more attention.[4] Part of the problem – whether for offshore or onshore emissions -- is that

[4] See e.g., S.N. Riddick et al, "Methane emissions from oil and gas platforms in the North Sea", Atmos. Chem. Phys., 19, 9787–9796, 2019, https://doi.org/10.5194/acp-19-9787-2019; A.M. Gorchov Negron, E.A. Kort, S.A. Conley & M. L. Smith, "Airborne Assessment of Methane emissions from Offshore Platforms in the U.S. Gulf of

estimates of GHG and other atmospheric emissions are rife with a variety of problems including incomplete inventory counts of equipment that may produce emissions and the use of incorrect emissions factors (values that attempt to relate the quantity of a pollutant with an activity associated with the release of that pollutant, such as fuel usage).[5] Another part of the problem is that detection and control of GHGs and other emissions that occur apart from combustion processes, such as fugitive emissions from valves, storage tanks, flaring equipment and other equipment are often undercounted. While some of this is no doubt due to the fact that many governments, including Canada, have traditionally prioritized the use of combustion-centered emissions factors,[6] it is incumbent on proponents to do their best to ensure that they will detect, measure, report and mitigate all manner of emissions, intended as well as unintended. In this time of rapidly worsening climate crisis, making the maximum effort to reduce all atmospheric emissions should be the approach undertaken by all oil and gas companies. This expectation is higher still for companies that hold themselves out as "industry leaders" in sustainability and/or reducing carbon footprint of projects.

Additionally, proponents should ensure that their projects are consistent with the emissions objectives of the host state. In the case of Canada, this means respecting its obligations under the *Paris Agreement* to report and reduce GHG emissions from activities under its jurisdiction, including offshore activities under its jurisdiction.[7] Furthermore, while the *Paris Agreement* does not require the implementation of global best practice standards by the signatories, the *UN Law of the Sea Convention* (UNCLOS) does contain such a requirement.[8] It is widely held that GHG emissions satisfies the UNCLOS definition of "pollution".[9]

The EIS for Bay du Nord reveals an approach that is seriously out of step with the need to pursue the best practices for limiting GHGs and other atmospheric emissions. As a result, the EIS fails to help the host state, Canada, meet and hopefully exceed its international obligations on GHGs and air pollution. Specifically, the EIS reflects and an overly narrow focus on the sources of GHG emissions. First, it relies heavily on consideration of sources of emissions due to the combustion involved in producing energy and heat for operations and living accommodations aboard the FPSO (which could house up to 110 personnel), and combustion of fuel related to the operation of drillships, construction and supply vessels and helicopter activity. As mentioned above, the problem with this approach is that it virtually ignores other sources of emissions, such as those from fugitive emissions and planned or emergency venting. It also excludes any estimate of air emissions that could arise from an accident onboard the FPSO or other

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Mexico", *Environ. Sci. Technol*. 2020, 54, 5112-5120, at p. 5112, https://pubs.acs.org/doi/10.1021/acs.est.0c00179.

[5] A.M. Gorchov Negron, E.A. Kort, S.A. Conley & M. L. Smith, "Airborne Assessment of Methane emissions from Offshore Platforms in the U.S. Gulf of Mexico", *Environ. Sci. Technol*. 2020, 54, 5112-5120, at p. 5112, https://pubs.acs.org/doi/10.1021/acs.est.0c00179.

[6] Canada's new methane regulations, which require attention to methane releases from venting and fugitive emissions, represent a positive step away from reliance on emissions factors for the estimate of emissions. More is said about these new regulations below in this document.

[7] See e.g., S.W. Watson, "Greenhouse gas emissions from offshore oil and gas activities – Relevance of the Paris Agreement, Law of the Sea, and Regional Seas Programmes". *Ocean and Coastal Management* 185 (2020), at p. 5, https://www.sciencedirect.com/science/article/abs/pii/S0964569119301681.

[8] Ibid at p. 7.

[9] Ibid at p. 8.

vessel connected to the project. If such estimates are required for liquids or other substances escaping as the result of an accident or incident, then so should estimates of atmospheric emissions be required

The EIS is wholly inadequate on the issue of methane emissions

In April 2020, scientists at the U.S. National Oceanic and Atmospheric Administration reported that in 2019, the concentration of atmospheric methane reached the highest level since record-keeping began in 1983.[10] As a greenhouse gas with approximately 80 times more heat-trapping power than carbon dioxide, this is of great concern. International Energy Agency analyses have "consistently shown that action to reduce methane emissions is one of the most cost-effective options to reduce global emissions and an essential complement to efforts to bring down emissions of carbon dioxide."[11]

In this context, SCCF finds it both perplexing and unacceptable that the Bay du Nord EIS is essentially devoid of any discussion relating to potential methane emissions from this project. While the proponent mentions that it has made efforts to reduce direct emissions from projects including efforts at "reducing methane emissions",[12] the EIS contains no such information in relation to the Bay du Nord project.

The lack of attention given to methane detection, measurement and mitigation in the EIS is even more inexplicable in light of the fact that several recent studies have shown that offshore oil and gas platforms release more methane than previously estimated from government inventories.[13] This research echoes findings in studies of onshore gas and oil methane emissions.[14] In Canada as well, rising methane emissions from onshore oil and gas operations have made the news, along with mention of Canada's new initiative to reduce methane emissions by federal regulation.[15]

The EIS ignores Canada's new methane regulations, Part 2 of which apply to offshore facilities

In January 2020, Canada issued new federal regulations aimed at reducing the release of methane and certain volatile organic compounds in the oil and gas sector.[16] The regulations apply to upstream oil and gas facilities that extract, process and/or transport hydrocarbon gas, and the requirements differ in scope depending on the volume of gas involved, and they apply to offshore as well as onshore facilities (offshore facilities are covered by Part 2). Like some other offshore oil production projects, Bay du Nord

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[10] J. Deaton, "Methane Levels Reach an All-time High", *Scientific American* (online) April 12, 2020, https://www.scientificamerican.com/article/methane-levels-reach-an-all-time-high/.

[11] K. Konschnick & F. Reuland, "Canada steps up its efforts to reduce methane emissions" IEA, 17 February 2020, https://www.iea.org/commentaries/canada-steps-up-its-efforts-to-reduce-methane-emissions.

[12] EIS, Chapter 2, p. 2-8.

[13] See e.g., S.N. Riddick et al, "Methane emissions from oil and gas platforms in the North Sea", Atmos. Chem. Phys., 19, 9787–9796, 2019, https://doi.org/10.5194/acp-19-9787-2019; A.M. Gorchov Negron, E.A. Kort, S.A. Conley & M. L. Smith, "Airborne Assessment of Methane emissions from Offshore Platforms in the U.S. Gulf of Mexico", *Environ. Sci. Technol*. 2020, 54, 5112-5120, at p. 5112, https://pubs.acs.org/doi/10.1021/acs.est.0c00179.

[14] See e.g., H. Tabuchi, "Oil and Gas May Be a Far Bigger Climate Threat Than We Knew," New York Times, February 19, 2020, https://www.nytimes.com/2020/02/19/climate/methane-flaring-oil-emissions.html.

[15] J. Lewis and R. Nickel, "As Canada curbs methane emissions, new measurements show problem bigger than thought," Reuters, August 16, 2020, https://www.reuters.com/article/us-global-oil-canada-methane/as-canada-curbs-methane-emissions-new-measurements-show-problem-bigger-than-thought-idUSKCN25C0GF?rpc=401&.

[16] *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector*, SOR/2018-66, https://laws-lois.justice.gc.ca/PDF/SOR-2018-66.pdf .

will extract gas that will not be marketed as a product. Rather, the produced gas will be utilized on site, with a small amount being used to fuel for the FPSO during the operational phase, and the remainder being re-compressed and reinjected into the reservoir for pressure support.[17]

Based on the foregoing, it seems reasonable to presume that the new methane regulations would apply to the project. The EIS, however, makes no mention whatsoever of the regulations, nor any of the kind of methane reduction methods mentioned in Part 2 such as adherence to venting limits, record-keeping, compressor emissions, detection systems and repair of leaks. If, for some reason, the proponent believes the project is not subject to the new regulations, it should explain why in the EIS.[18] Silence seems inappropriate given the government's heightened interest in reducing methane emissions.

IV. Insufficient information on the purpose of the project in relation to target markets for the oil

The EIS for the Bay du Nord project, requires the proponent to "describe the purpose of the project by providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent."[19] The proponent's one-sentence description of purpose is tautological and as such, completely unhelpful. It states, "The purpose of the Project is to develop the Core BdN Development which includes Bay du Nord, Bay de Verde and Baccaileu." With all due respect to the proponent, this is tantamount to saying that "the purpose of the project is to do the project." Any reasonable reader would expect to see some explanation of why this offshore project will go forward – other than to provide jobs. Providing jobs may be a benefit of the project, but the Bay du Nord project is most certainly not being undertaken by the proponent strictly as a job-creation project. The proponent is a state-owned Norwegian company, and in any case, large companies such as Equinor are not in the business of creating jobs. They are in the business of producing oil for market.

While SCCF understands that the EIS for Bay du Nord does not specifically require a market study, common sense dictates that by asking for a "rationale for the project" the EIS requests that the proponent discuss – even if only in very general terms -- the issue of likely or potential markets for the product to be produced at the project. This expectation is particularly reasonable given that market information, including full market studies, have often been required in environmental assessments of large petroleum infrastructure projects in Canada (e.g., the Trans Mountain Expansion project in British Columbia).

The Bay du Nord EIS is virtually silent on the issue of markets for the oil to be produced by the project. Throughout the EIS, one sees only a handful of references to markets, primarily referencing "international markets", which makes since in relation to the passing references made to exports at a few points in the document. There appears to be no specific discussion whatsoever of domestic markets. In addition to general concerns about transparency for the public, an important reason for wanting to know the destination of the oil pertains to the evaluation of potential impacts. For example,

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[17] EIS, Chapter 2, at p. 2-37.

[18] As explained in the Guidance Document for the new methane regulations, should a regulation under the Canada-Newfoundland and Labrador Atlantic Accord Implementation Act be made that imposes requirements as least as strict as the federal regulations, then the Accord regulations would apply instead. See p. 1 of the Guidance Document at https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/regulations-reduction-methane-guidance-document.html.

[19] EIS Guidelines, Section 2.1, at p. 2-14.

if as the EIS states, some of the oil may be shipped directly to international markets rather than to the transshipment facility at Whiffen Head,[20] then the potential destinations and length of those tanker transits to and from the project site, need to be known in order to properly estimate atmospheric emissions from those vessels. As it currently stands, the discussion on atmospheric emissions says only that "shuttle tankers" are expected to make about 78 trips per year, to and from the transshipment facility, which is obviously vastly closer than any international destination. The lack of proper market information directly interferes with the proper estimation of GHG and other atmospheric emissions.

PART 2: Oil Spill Response and Risk – Comments Prepared by *David Prior, President, Extreme Spill Technology Inc., Halifax, Nova Scotia, Canada*

I. Spill and Accident Response (Comments on Chapter 5 of the EIS)

a. Lack of credible plan to respond to oil spills and accidents

The Bay du Nord oil spill plan is essentially copied and pasted from BP's Deepwater Horizon (DWH) oil spill plan, which was essentially copied and pasted from the Exxon Valdez oil spill plan. BP's DWH plan captured only 3% of the oil spilled[21] in the summertime Gulf of Mexico. It is logical that Equinor's Bay du Nord oil spill plan for winter North Atlantic will capture much less than 3%. Recently, Husky Energy had three *much smaller* oil spills (relative to these large spills) and captured zero percent of the oil spilled. We can expect that the Bay du Nord oil spill plan will produce the same zero amount, particularly involving a serious spill like a well blowout or a shuttle tanker ship accident.

b. Failure to address the consequence of oil spills on fishing grounds of Flemish Cap

Wind and wave data, of which there are copious amounts in the document, has no value for oil spill mitigation. Table 5.18, page 5-42 demonstrates that the wind is primarily from a westerly direction. As long as the oil slick remains on the surface, it will be blown away from NL and toward the open Atlantic Ocean, and onto the prolific fishing grounds surrounding the Flemish Cap. Eventually it will sink and contaminate these valuable areas of the seafloor because the Equinor oil spill mitigation plan has zero capability of getting the spilled oil out of the ocean. Naturally occurring microbes will eventually consume the oil, but not quickly, and certainly not when the microbes are overwhelmed by a tsunami of oil [22].

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[20] EIS, Chapter 2, pages 2-39 and 2-45.

[21] Deep Water: The Gulf Oil Disaster and The Future Of Offshore Drilling - Report to the President (BP Oil Spill Commission Report. January 2011. p 168 (https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf)

[22] CBC Doc Zone: Blowout NL offshore oil spill 2010 (minute 22:38 to minute 27:23). http://www.spilltechnology.com/videos/Doc%20Zone%20-%20Blowout%20-%20Is%20Canada%20Next%202010-12-09.flv

c. Use of dispersants would cause oil and toxins to flow to Scotian Shelf, Gulf of Maine

When oil dispersants like Corexit are used, the oil will sweep underwater to the Scotian Shelf and the Gulf of Maine. Corexit oil dispersant was legalized for use at Bay du Nord in 2016[23]. When Corexit is used, there will be no favourable wind direction when the oil spills at Bay du Nord. The oil will be flowing southwest along the bottom of the ocean.

The EA document does not address the consequences of this for ocean life and fisheries ad rely on these resources.

d. Wave data illustrates that proposed spill response will fail

Table 5.18 has valuable wave data for oil spill mitigation at Bay du Nord. The data reveals that it will always be impossible to remove an oil spill from the ocean using floating booms because the waves will always be too high for booms to be effective. It is likely that these waves will also generate surface currents that render floating boom useless. The International Tanker Owners Pollution Federation (ITOPF) declares that floating boom cannot contain the oil in currents faster than 0.7 kts (35 cm/second).[5] For instance, tidal currents on the Scotian Shelf regularly run at 3 kts (150 cm/second). Currents at Bay du Nord would be less, due to lower tidal forces, but will likely not be lower than 1 knot. There is no such thing as seaworthy floating boom, one of the primary tools in the oil spill "tool kit", and the oldest, most out-dated and most ineffective.

It is the same story with oil skimmers that are supposed to remove the oil from the sea surface. Admiral Zukunft[24], head of the US Coast Guard, said this about waves and oil spill mitigation:

"We saw during Deepwater Horizon, whenever the seas are over 4 feet (1.2m), our ability to mechanically remove oil was virtually impossible," he said at a Washington symposium, hosted by the U.S. Arctic Research Commission.[25]

Table 5.18 reveals that the *smallest* significant wave heights recorded at Bay du Nord were, on average, 1.6 m high. Therefore, Equinor has zero capability to remove spilled oil from the ocean at Bay du Nord *at any time of year*.

e. When present, ice will make oil recovery methods completely ineffective

There is ice at Bay du Nord[26]. Oil spill mitigation will fail even in light ice conditions when the skimmers get plugged and the floating boom gathers ice and gets shredded. In heavier ice conditions and dynamic

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[23] http://www.gazette.gc.ca/rp-pr/p2/2016/2016-06-15/html/sor-dors108-eng.html#archived

[24] The U.S. Is Not Ready to Clean Up an Arctic Oil Spill: No viable methods exist to clean up oil from ice and drilling would occur in incredibly remote areas. Scientific American. July 19, 2017 (https://www.scientificamerican.com/article/the-u-s-is-not-ready-to-clean-up-an-arctic-oil-spill/)

[25] 7th Symposium on the Impacts of an Ice-Diminishing on Naval and Maritime Operations, 18-20 July 2017 (https://www.maritime-executive.com/article/adm-zukunft-we-are-not-ready-for-arctic-oil-spills)

[26] https://iaac-aeic.gc.ca/050/documents/p80154/135573E.pdf Pages 5-85

(flowing) pack ice, the fragile oil spill tools that Equinor plans to deploy will simply be crushed and demolished, often within seconds.

Equipment intended for oil spill containment (i.e. sheet metal and plastic Arctic oil spill tools) are tested in New Jersey, in a large tank filled with ice cubes.[27] Sea conditions in the New Jersey tank do not resemble sea conditions on the North Atlantic where Bay du Nord is located.[28]

In addition to floating ice, there are going to be months of icing every year at Bay du Nord. Oil spill tools, equipped with rotating brushers and conveyer belts that splash water vigorously, will become clogged with ice.[29]

f. Risk of oil spills from oil tankers is not addressed in spill response plan

The EIS must provide information on the intended response and possible impacts of an accident involving tankers transporting oil produced at Bay du Nord. There will be storms at Bay du Nord strong enough to sink a shuttle tanker.[30] Hurricanes are not required, as implied in the EIS.[31]

The cold dense air in a winter storm packs more punch than the very warm air in a hurricane. There are 60,000 ships in the world[32], and not all of them are structurally sound and competently operated. Even some relatively new ships have hidden defects.[33]

II. Accidental Events (Comments on Section 16.1 Spill Prevention and Response of the EIS)

a. There is nothing in EIS that would Protect the Environment if Prevention Measures Fail

> "Equinor Canada's emergency management philosophy is to prevent spills from happening, and in the unlikely event a spill would occur, to reduce the impact of an emergency on people, environment, and the integrity of Equinor Canada, contractor, and third-party assets." - Equinor Canada's Bay du Nord EIS

Prevention always fails (RMS Titanic, the Concorde, the Challenger space shuttle etc, etc). Equinor's Bay du Nord project is vulnerable to Blow Out Preventor (BOP) failure. The most likely cause of failure will be

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[27] https://www.ohmsett.com/gazette/Ohmsett%20Gazette%20Spring%20Summer%202013%20Final.pdf

[28] Rough Seas.Tomas Marshall. https://www.youtube.com/watch?v=mPBaqh3dcVM

[29] http://www.spilltechnology.com/videos/RBS_TRITON_Offshore_skimming_system.m4v.flv. minute 2:35

[30] Freak Wave.BBC2 Horizon Film. https://www.youtube.com/watch?v=mC8bHxgdHH4

[31] https://iaac-aeic.gc.ca/050/documents/p80154/135573E.pdf, Section 5.6.1.4, pages 5-102

[32] https://www.shipmap.org/

[33] https://gcaptain.com/mol-comfort-investigation-report-released/

common human error[34] which is forever appearing in *unexpected* ways. Black Swan events such as blowouts, dropping the riser[35] or a shuttle tanker catastrophe in a severe storm[36] cannot be predicted, so the prodigious calculations of probabilities and trends, while they look impressive, are useless for mitigating the risk of an oil spill.

The probability of BP's DWH blowout was considered to be zero before it occurred. Plans can always look good on paper; the executions of the plans often fail because of human error. **There is nothing in Equinor's Bay du Nord EIS to effectively protect the ocean environment when the prevention plan fails.** Zero preparation for the plan's failure is considered acceptable because the possibility of a serious accident is deliberately underestimated, as evidenced by the sprinkling of the standard industry preface "In the extremely unlikely event of a blowout, spill, accident… etc".[37]

These catastrophic events, while not everyday occurrences, have been happening for more than a century, and keep on happening, so they are not "extremely unlikely". In fact, **there have been four large spills and one near-fatal accident in the Newfoundland offshore in the last two years**.[38] These failures need to be planned for, but this is not done in this EIS. There is no credible plan for dealing with any size of oil spill. Equinor Canada is utilizing the Husky Energy's failed spill plan[39] which is a carbon copy of BP's DWH failed oil spill plan, which is a carbon copy of the Exxon Valdez failed oil spill plan. **What all of these response plans have in common is a *proven* record of complete failure at protecting the ocean from an oil spill**.

b. Proposed Mechanical Recovery Methods of Spill Response will not work at Bay du Nord

> "As part of Equinor Canada's Incident Management System processes, Incident Action Plans will be developed that may include the following response strategies, depending on the magnitude of the offshore spill event. The magnitude of potential spills is divided into three levels, or tiers, as outlined in Section 16.1.2.3." (**Page 16-5 of the EIS)**
>
> "… Depending on the volume and ocean conditions, implement mechanical recovery through deployment of absorbent booms, ocean rated skimmers and booms."

We already know that the ocean at Bay du Nord is ***never*** calm enough for mechanical recovery (See Section V, above), and the location often experiences from poor visibility. We also know that

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[34] Deepwater Horizon Blowout Animation.US Chemical Safety Board. June 5, 2014. https://www.youtube.com/watch?reload=9&v=FCVCOWejlag

[35] https://www.halifaxexaminer.ca/wp-content/uploads/2016/10/Shell-Part-1.pdf

[36] https://www.youtube.com/watch?v=7P-a3OP6laQ

[37] https://www.allcountries.org/uscensus/390_oil_spills_in_u_s_water.html

[38] https://www.thetelegram.com/news/local/offshore-incidents-at-forefront-of-oil-spill-response-prevention-forum-in-st-johns-384302/

[39] https://business.financialpost.com/commodities/energy/n-l-s-largest-ever-oil-spill-is-now-impossible-to-clean-up-regulatory-board

absorbent booms, ocean rated skimmers and booms are worthless tools beyond sheltered harbours.[40]

c. Proposed Use of Dispersants Represents an Additional Threat to the Environment

We already know how destructive dispersants are. In the DWH spill Corexit drove oil to the seafloor, where researchers detected traces for thousands of square miles.[41] Oil that went to the bottom that contains Corexit will kill those microbes that normally would eventually break down oil, and actually prevent toxic oil from biodegrading.[42] [43] [44] [45] [46]

Internationally recognized risk expert Dr. Robert Bea[47] calls dispersants and in-situ burning "primitive", and so they are. [48] Dispersants *of any kind* inject the toxins contained in the crude and fuel oils into the ocean food chain. In-situ burning produces vast amounts of black soot, which is responsible for 30% of Arctic warming.[49]

> "Response with aerially applied dispersants, which can be quickly deployed and treat large surface areas rapidly and efficiently"

Even if spraying dispersants by aircraft was a safe and sensible idea (it never is), the dispersant toxins will not be sprayed on the ocean for days and weeks when the weather is adverse, or visibility is poor. Quick deployment is impossible much of the time.

> "Continue to use aerially applied dispersant as a primary response tool for oil further from the Source where mechanical recovery/in situ burn operations are less effective."

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[40] http://www.spilltechnology.com/videos/Trans-Rec_Skimmer.mp4

[41] https://www.pnas.org/content/114/1/E9

[42] http://www.pnas.org/content/112/48/14900.full

[43] https://www.youtube.com/watch?v=mA3LLf5rp8M, minute 39:50 to minute 43:42

[44] https://www.youtube.com/watch?v=GrJlUVCe4VA, minute 8:12 to minute 8:40

[45] https://www.sciencedirect.com/science/article/abs/pii/S0269749112004344

[46] https://scienceblog.com/58149/worse-than-the-problem-clean-up-makes-2010-spill-52x-more-toxic/

[47] https://engineering.berkeley.edu/robert-bea/

[48] https://www.nationalobserver.com/2018/05/08/has-canada-made-itself-vulnerable-disaster-deepwater-horizon

[49] http://www.sciencepoles.org/article/black-carbon-playing-major-role-in-arctic-climate-change

Rick Dawson (Retd)[50] of the US Department of the Interior states that "*The worst thing you can do following an oil spill is to use chemical dispersants to breakdown and remove the oil".*

The proposed response also indicate that dispersants would be used on emulsifies oil. ("Use aerial dispersant application during calm seas on emulsified oil "). There is no reliable flying weather at Bay du Nord, and dispersants need to be utilized immediately, before the oil emulsifies. Dispersants have one function and that is to bury the oil spill in the ocean food chain. [51] Out of sight, out of mind.[52]

d. The impact of dispersants on ocean life is not addressed in the EIS

> "Implement subsea dispersant injection application as soon as possible, if warranted, to treat most oil spilled at the source before it encounters surface water resources"

"Surface water Resources" presumably refers to birds, fish, and whales, some of which may be endangered. These animals have to swim down into the water column to eat plankton and fish, all of which have been poisoned by dispersant.

The poisoned water and fish will poison the birds and whales in turn (the surface water resources). Dispersant is ideal for hiding the oil spill[10] but the toxic implications for wildlife, fish and the food web are documented.

e. In-Situ Burning (ISB) of spilled oil will not work at Bay du Nord

> "Deploy in situ burning (ISB) equipment to burn thick oil near the source "

In order to function, ISB requires a calm ocean. We know this essentially does not exist at Bay du Nord. ISB is another failed tool from the 1970's that processes only a small percentage of an ocean oil spill *even under ideal conditions. For example, in the much calmer conditions of the Gulf of Mexico,* only 5% of BP's DWH oil spill was in-situ "burned".

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[50] https://www.youtube.com/watch?v=GrJlUVCe4VA, **minute 12:53**

[51] https://www.forbes.com/sites/nishandegnarain/2020/09/04/rushing-to-remove-wakashio-oil-will-cause-irreversible-damage-to-mauritius-warn-oil-spill-veterans/#1d40e9dba8e4

[52] https://www.cbc.ca/radio/quirks/may-25-sharks-on-a-bird-diet-fossils-of-fungus-lifelike-machines-and-more-1.5147055/what-happens-to-oil-spills-after-dispersant-is-used-1.5147057

f. Outfitting "vessels of opportunity" for oil spill clean up is not credible oil spill response

Failed oil spill tools from around the world will never be appropriate tools for Bay du Nord or anywhere on the NL coast.[53] Appropriate tools are not going to appear in the future.[54] This is the innovation state of the art today.[55] Air bubbles, while cheap, will not dominate the vast North Atlantic in winter.

g. Using Booms to Protect Coastlines Does Not Work

"In the extremely unlikely event of shoreline impact, sensitive shorelines will receive prioritization for protective booming "

Protective booming on the ocean and in coastal waters has always been a failure. In 2010, BP deployed almost 4,000 km of boom, much of it "ocean" boom.

Figure 1 Deepwater Horizon, 2010

h. 115 Days of Uncontrolled Spill would unleash the equivalent of 1.5 Deepwater Horizon or 33 Exxon Valdez Spills: An Unacceptable Risk to the Environment

"The failures at Deepwater Horizon exposed how unprepared the industry was to respond to such a catastrophic event. Today,[56] capping stacks are kept onshore, ready to be deployed for another well blowout. They can weigh up to 100 tons and are built to withstand the high pressure coming from a blown-out well. The stack connects to the blowout preventer, adding additional valves that can be closed to slow and stop the flow of oil until the well can be permanently sealed.

Recent spills and accidents in the Atlantic Canadian offshore oil and gas industry indicate that we are at risk of a blowout. When the Stena IceMax dropped its riser while drilling in deepwater the Scotian Shelf in March 2016, the riser crashed to the seafloor only twelve metres away from the Blow Out Preventor

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[53] http://www.spilltechnology.com/videos/Trans-Rec_Skimmer.mp4
https://www.youtube.com/watch?v=FHqjgmUL-Po&t=3s

[54] https://www.youtube.com/watch?v=bq2HbB5rntk&t=19

[55] https://link.springer.com/article/10.1007/s42797-019-00005-6

[56] https://www.theverge.com/2020/4/20/21228577/offshore-drilling-deepwater-horizon-10-year-anniversary

(BOP).[57] If the capping stack cannot be attached to the BOP because the BOP is laying in the mud after being knocked sideways by 100 tonnes of drill pipe plunging to the seafloor at 80 kts, then only the relief wells can stop the flow.

If a Bay du Nord blowout occurs because the BOP is accidentally toppled by a plunging riser pipe, then we will see **a 115 day blowout** according to the Equinor EIS.

Based on the flow rate calculated by Equinor Canada, it will unleash more than **1.2 million tonnes of oil which is equivalent to 1.5 DWH spills or 33 Exxon Valdez oil spills**. That is a lot of oil to clean up in the middle of winter.

i. Sub-sea Leak is "Doomsday" Scenario with No Credible Mitigation

"If there were to be a leak below the seafloor, the oil would dissipate into the rock formation surrounding it and escape wherever it can find cracks in the rock. "That would be a doomsday scenario because there's no way you can shut it off," says Murawski.[58]

In this scenario, and the leak can only be stopped only by emptying the reservoir, we risk uncontrolled spill of oil lasting for years.

III. Batch Spills

Based on Table 16.27, the largest batch spill will be 8,300 m^3 from an FPSO. There appears to be no mention of a shuttle tanker or an Ultra Large Crude Carrier (ULCC) transiting fully loaded from the Equinor facility to its overseas destination. A ULCC can carry 400,000 m^3 of crude oil (1/2 of the DWH oil spill in a single ship accident). That is a lot of oil erupting on the surface of the ocean in a single batch. If an extreme weather event can sink an FPSO (below), it can sink a ULCC.[59] Here is an extreme weather event that occurs regularly in the North Atlantic.[60] The Scotian Shelf wave buoy off NS measured a freak wave 31.5 metres high.

IV. Failure to address consequences of accidents (Section 16.2.3 Loss of Stability or Structural Integrity)

Stability is managed by controlling the distribution of weight both across the installation and below and above the waterline. A loss of stability or structural integrity could cause the installation to list, capsize, or sink. Note: The "installation" is the immense production ship (FPSO) filled with oil.
A loss of stability or structural integrity could be caused by a design or operation error, specifically its ballast system, or by an extreme weather event. Other events, for example a vessel collision, or a fire or explosion during a loss of well control event, could also result in the loss of stability or integrity to the FPSO and/or drilling installation.

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[57] https://www.thestar.com/opinion/commentary/2016/10/25/offshore-drilling-incident-a-harrowing-warning.html

[58] https://www.theverge.com/2020/4/20/21228577/offshore-drilling-deepwater-horizon-10-year-anniversary

[59] https://www.youtube.com/watch?v=9tN4xROtMjI

[60] https://www.youtube.com/watch?v=mC8bHxgdHH4

A loss of stability could also result in a loss of primary containment on the drilling installation and/or FPSO, *which could result in adverse environmental consequences*. There is also a possibility that a loss of drilling installation stability could cause a loss of well control (i.e. a blowout).

V. Special areas near the project (both inside and outside the 200-mile zone)

Special areas that stand out are the Flemish Cap fishing ground and the Grand Banks. The project is located in an area designated as a UN Convention of Biological Diversity Ecologically Biologically Significant Area (ESBA), and the Northeast Newfoundland Slope Closure and NAFO Fisheries Closure Areas are within the study area for the EIS.

These fishing grounds and ecologically rich areas will be oiled by a spill at Bay du Nord if Corexit, or *any* dispersant, is used.