



Nunavut Impact Review Board Follow-up Report for the Strategic Environmental Assessment in Baffin Bay and Davis Strait

NIRB File No. 17SN034



Follow-up Report to Final SEA Report and Recommendations

November 2020

The logo for the Nunavut Impact Review Board (NIRB) features a stylized green map of Nunavut in the background. Overlaid on the map is a red Canadian maple leaf. Above the leaf, the Inuktitut phrase "ᓄᓇᑦ ᐃᕿᑎᑦᑲᓄᑦ ᑲᑏᐱᓂᑦ" is written in black. Below the leaf, the acronym "NIRB" is displayed in large, bold, black letters. Underneath each letter of the acronym are its English components: "NUNAVUT" under N, "IMPACT" under I, "REVIEW" under R, and "BOARD" under B. At the bottom, the full name in Inuktitut, "NUNAVUMI AVATILIKIYIN KATIMAYIN", is written in black capital letters.

Study: Strategic Environmental Assessment in Baffin Bay and Davis Strait
Study Location: Qikiqtani Region, Nunavut
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ACRONYMS AND ABBREVIATIONS

<u>ACRONYM</u>	<u>Definition</u>
AARD	Arctic Aquatic Research Division of Fisheries and Oceans Canada
APNN	Ministry of Fisheries, Hunting and Agriculture – Government of Greenland
CanPAC	Canadian Arctic Marine Priority Areas for Conservation
CCG	Canadian Coast Guard
CER	Canada Energy Regulator
CHS	Canadian Hydrographic Service
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
DIO	Designated Inuit Organization
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EPPR	Emergency Prevention, Preparedness and Response
GSC	Geological Survey of Canada
GN	Government of Nunavut
KEBABB	Knowledge and Ecosystem Based Assessment for Baffin Bay
MPA	Marine Protected Area
NRCan	Natural Resources Canada
NIRB or Board	Nunavut Impact Review Board
NSA	Nunavut Settlement Area
NTI	Nunavut Tunngavik Incorporated
OPP	Oceans Protection Plan
PCA	Parks Canada Agency
PAME	Protection of the Arctic Marine Environment
SAR	Species at Risk
SEA	Strategic Environmental Assessment in Baffin Bay and Davis Strait
TC	Transport Canada
TINMCA	Tallurutiup Imanga National Marine Conservation Area
QIA	Qikiqtani Inuit Association
VEC	Valued Ecosystem Component
WWF	World Wildlife Fund

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1. NON-TECHNICAL SUMMARY

The Nunavut Impact Review Board (NIRB or Board) submitted its Final Report and Recommendations for the Strategic Environmental in Baffin Bay and Davis Strait (the SEA) to the Minister of Crown-Indigenous Relations and Northern Affairs on July 31, 2019. The Final SEA Report and Recommendations are to be considered by the Government of Canada in the review and reconsideration of the December 2016 decision to designate Canadian Arctic waters as off limits to future oil and gas licences (the moratorium). The NIRB is interested in identifying and tracking how the Board's recommendations are being addressed. On March 23, 2020 the NIRB reached out to parties involved in the SEA process to identify how recommendations are either currently being or are planned to be addressed. This report was developed to provide the public with a summary of responses received and to track the progress of work undertaken to fulfill the Board's recommendations.

The purpose of the SEA was to better understand the possible types of oil and gas related activities that could be proposed within a defined area of focus in Baffin Bay and Davis Strait, and their potential risks, benefits, and management strategies. The NIRB was responsible for coordinating the SEA, including determining what oil and gas development in a defined area in Baffin Bay and Davis Strait might involve, collecting and considering available information and Inuit Qaujimajatuqangit and Inuit Qaujimaningit, facilitating public engagement, and writing a final report with recommendations.

The Board's central conclusion of the SEA was:

Given the importance of the marine environment to the well-being of Nunavummiut, significant gaps in knowledge of the environment necessary to support impact assessment, and an overall lack of regulatory, industry, and infrastructure readiness in Nunavut, the 2016 moratorium on oil and gas development in the Canadian Arctic should remain in place for Baffin Bay and Davis Strait until such time as the key issues set out in this Report can be addressed. The Board expects that it will take at least a decade to complete the research, planning, and consultation identified as necessary prior to undertaking a re-assessment by the Minister to determine if the moratorium should be lifted.

The Board made 79 recommendations to address comments, concerns, and recommendations of the participants in the SEA. The NIRB's recommendations focused on what needs to be accomplished with much less emphasis on how the objectives should be met. The NIRB received comments on how recommendations are being, or plan to be, addressed by the following parties:

- Government of Nunavut
- Crown-Indigenous Relations and Northern Affairs Canada

- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- Natural Resources Canada
- Parks Canada Agency
- Transport Canada
- Canada Energy Regulator (previously National Energy Board)
- World Wildlife Fund – Canada
- Ministry of Fisheries, Hunting and Agriculture - Government of Greenland

Many parties commended the NIRB on the work undertaken during the SEA and the transparency of the process and final report. Throughout the comments were examples of Nunavut and transboundary Inuit organizations, territorial, federal and transboundary governments, non-governmental organizations and academic institutions, and communities working together on studies and projects.

There were many topics discussed within comment submissions, including:

- In air and underwater sound and effects on marine species (acoustic environment);
- Geology, risks (including landslides, earthquakes and tsunamis); and naturally occurring oil seeps;
- Coastal landforms and coastlines;
- Sea ice;
- Plants and animals on the seafloor (benthic flora and fauna);
- Fish and fish habitat, waterbirds, marine mammals, and species at risk (SAR);
- Fisheries;
- Food security;
- Greenhouse gas emissions, climate change and climate impacts;
- Offshore oil and gas requirements;
- Regulatory regime;
- Royalties and benefits;
- Emergency preparedness, prevention, and response;
- Shipping;
- Inuit rights, Inuit Qaujimajatuqangit and Inuit Qaujimaningit;
- Marine planning;

- Marine monitoring and community-based monitoring;
- National marine conservation areas and national parks and associated studies; and
- Economic alternatives to offshore oil and gas.

The NIRB understands that the Board's Final SEA Report and associated recommendations are currently being considered in the five-year review of the moratorium on offshore oil and gas activities in the Canadian Arctic both in terms of action plans to address the recommendations as well as using the outcomes to inform the review. While the NIRB will continue to track how the Board's recommendations are being addressed, the frequency of updates will not necessarily be on an annual basis.

2. INTRODUCTION

This Report was developed in follow-up to the Nunavut Impact Review Board's (NIRB or Board) Final Report and Recommendations for the Strategic Environmental Assessment in Baffin Bay and Davis Strait (the SEA; NIRB File No. 17SN034) submitted to the Minister of Crown-Indigenous Relations and Northern Affairs on July 31, 2019.¹ The purpose of the SEA was to better understand the possible types of oil and gas related activities that could be proposed within a defined area of focus in Baffin Bay and Davis Strait, and their potential risks, benefits, and management strategies. The NIRB was responsible for coordinating the SEA, including determining what oil and gas development in the Potential Development Scenarios Area might entail and potential impacts and effects throughout the Area of Focus,² collecting and considering available information and Inuit Qaujimajatuqangit and Inuit Qaujimaningit³, facilitating public engagement, and writing a final report with recommendations. The Final SEA Report and associated recommendations summarized the NIRB's assessment of hypothetical oil and gas development scenarios on valued components of the physical, biological and human environments as well as other key considerations.

The NIRB is interested in identifying and tracking how the Board's recommendations are being addressed and to provide a mechanism for the public to observe the progress of work undertaken to fulfill the Board's recommendations. On March 23, 2020 the NIRB reached out to its public distribution list inviting feedback on what recommendations have been identified as aligning with respective organization's mandates, how recommendations are being addressed to date, and plans for implementing going forward. [Section 5](#) provides a summary of the responses provided.

3. HIGH-LEVEL OVERVIEW OF THE SEA

The NIRB was established through Articles 10 and 12 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (Nunavut Agreement)* and is responsible for the assessment of biophysical and socio-economic impacts of projects in the Nunavut Settlement Area pursuant to the *Nunavut Agreement*. Pursuant to Section 12.2.4 of the *Nunavut Agreement*, the NIRB is further authorized to carry out additional functions agreed to by a Designated Inuit Organization (DIO), the Government of Canada, the Government of Nunavut (GN), or as may be set out in legislation.

On February 9, 2017 Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC;

¹ Public Registry IDs: 326172, 326173, 326174

² See Figures 1 and 2.

³ Inuit Qaujimajatuqangit refers to traditional values, beliefs, and principles while Inuit Qaujimaningit encompasses Inuit traditional knowledge (and variations thereof) as well as Inuit epistemology as it relates to Inuit Societal Values and Inuit Knowledge (both contemporary and traditional).

then Indigenous and Northern Affairs Canada) referred the SEA to the NIRB pursuant to section 12.2.4 of the *Nunavut Agreement*.⁴ In accordance with the Minister's referral, the NIRB was responsible for coordinating the assessment and providing a final report with recommendations to the Minister by May 2019 (later extended to July 2019). The NIRB's Final SEA Report and recommendations will inform the Government of Canada's review and reconsideration of the December 2016 decision to designate Canadian Arctic waters as off limits to future oil and gas licences for a five (5) year period (the moratorium).

Unlike a project-specific assessment, the SEA was designed to examine hypothetical oil and gas development scenarios in a specific area of offshore waters in Baffin Bay and Davis Strait to better understand what these activities could look like, identify gaps in available information, address questions and gauge public concern, and lead to recommendations for moving forward. Recognizing the need to rely on both traditional knowledge and scientific information, the Minister requested that the NIRB use Inuit Qaujimaningit and Inuit Qaujimajatuqangit collected by the Qikiqtani Inuit Association (QIA) and to also create opportunities for communities to meaningfully contribute to the assessment. A Working Group was formed with representatives from the NIRB, CIRNAC, Nunavut Tunngavik Incorporated (NTI), the QIA, and the GN. Working Group members each performed specific roles to support the SEA process and its success is in large part due to the significant time and effort put forward by these organizations.

The SEA was the first assessment of its kind in Nunavut and reflects a unique made-in-Nunavut approach that was developed by the NIRB, the participants in the SEA Working Group, and through feedback from Intervenor and community members. The Board's approach for the assessment was further modified as the assessment progressed to better reflect Inuit and community knowledge and feedback from all participants.

The Final SEA Report was the result of over two (2) years of collaboration between the NIRB, community members, knowledge holders, Inuit organizations, government agencies, and a wide range of interested parties. The Final SEA Report describes the hypothetical development scenarios that were examined to better understand what these activities could look like, identify gaps in available information, address questions and gauge public concern, and lead to recommendations for moving forward. Summaries are provided of the comprehensive review of available literature and the extensive public engagement that was undertaken throughout this assessment, as well as the outcomes of the analysis of potential effects of possible oil and gas activities. Importantly, the report also includes extensive references to the background documentation and the knowledge and Inuit Qaujimajatuqangit that informed and enriched the SEA.

⁴ Public Registry ID: 308411

3.1 SPATIAL BOUNDARIES

There are two (2) marine areas on which the SEA is focused: the Development Scenario Area and the Area of Focus (Figure 1 and Figure 2; created by CIRNAC). Figure 1: Development Scenario Area outlines in green the offshore area under the jurisdiction of CIRNAC where possible offshore oil and gas development scenarios were considered. This area is outside of the Nunavut Settlement Area and the Tallurutiup Imanga (Lancaster Sound) National Marine Conservation Area and under the authority of the Government of Canada. Figure 2: Area of Focus features the SEA Area of Focus in purple and is the greater area used to gather scientific information and Inuit Qaujimajatuqangit and Inuit Qaujimaningit on the existing physical, biological, and human environments and to assess the potential positive and negative impacts and effects of the oil and gas development scenarios.

Figure 1: Strategic Environmental Assessment Oil and Gas Development Scenarios Area

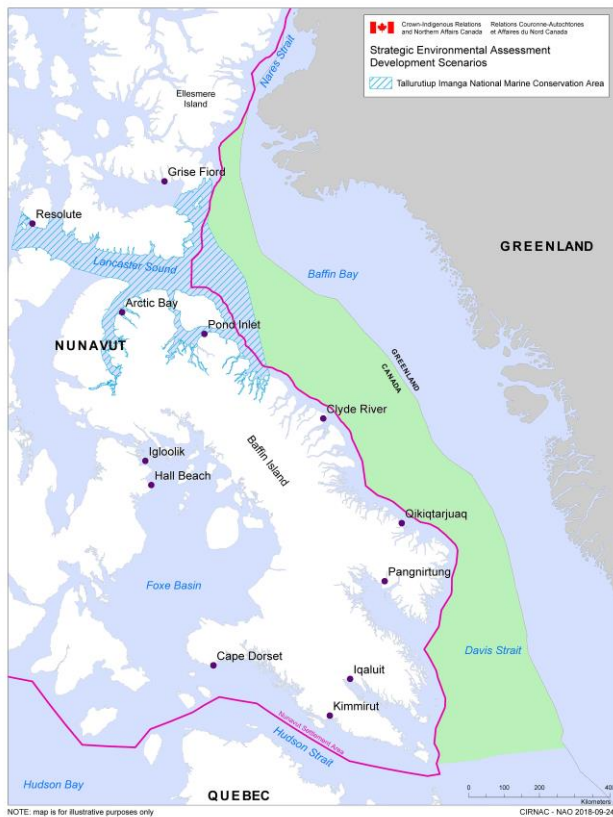
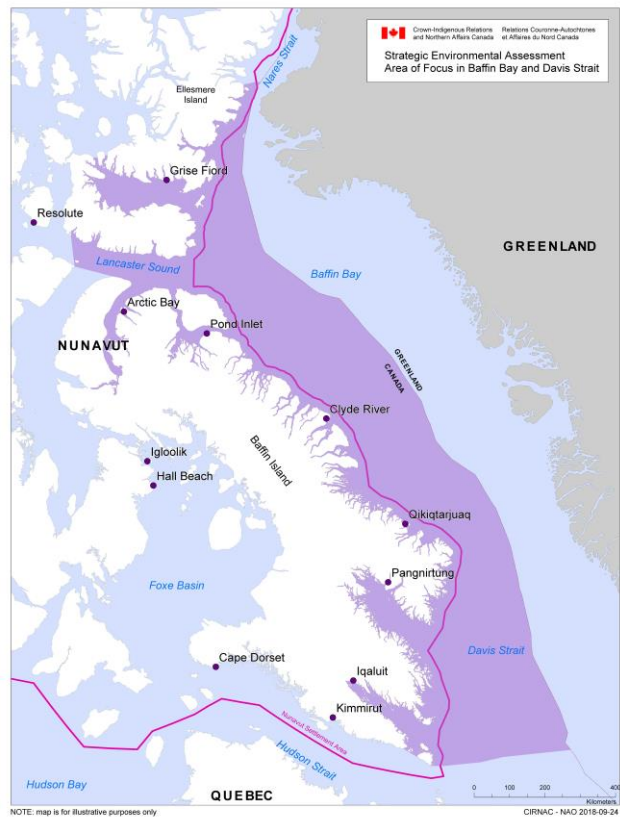


Figure 2: Strategic Environmental Assessment Area of Focus in Baffin Bay and Davis Strait



4. BOARD CONCLUSIONS AND KEY FINDINGS

Taking the submissions, input, and knowledge of parties provided throughout the SEA into

account, the Board's central conclusion of the SEA was:

Given the importance of the marine environment to the well-being of Nunavummiut, significant gaps in knowledge of the environment necessary to support impact assessment, and an overall lack of regulatory, industry, and infrastructure readiness in Nunavut, the 2016 moratorium on oil and gas development in the Canadian Arctic should remain in place for Baffin Bay and Davis Strait until such time as the key issues set out in this Report can be addressed. The Board expects that it will take at least a decade to complete the research, planning, and consultation identified as necessary prior to undertaking a re-assessment by the Minister to determine if the moratorium should be lifted.

The Board made 79 recommendations to address comments, concerns and recommendations of the participants in the SEA. The Board intentionally did not prescribe which authorities may be responsible for implementing its recommendations to limit the risk of recommendations becoming stale-dated with ongoing legislative changes and reforms to regulatory regimes. Similarly, recognizing that there may be many different ways to meet the objectives of the recommendations in terms of structures and approaches, the NIRB's recommendations focused on what needs to be accomplished, with much less emphasis prescribing how the objectives should be met. These findings and recommendations were informed by written and oral information and knowledge that the Board received throughout the SEA process.

The following five (5) central themes, which are explored in detail in the SEA Final Report, emerged over the course of the SEA and provided the basis for the NIRB's recommendations: Inuit Qaujimajatuqangit, Lack of Readiness, Gaps and Uncertainty, Marine Planning, and/or Alternatives.

The Board's recommendations contained within the Report were summarized by the following categories:

1. Recommendations Addressing Consultation, Coordination, and Public Engagement
2. Recommendations Addressing Regulatory, Royalty, and Benefits Regimes and Processes
3. Recommendations Addressing Baseline Research
4. Recommendations Addressing Assessment of Ecosystemic and Socio-Economic Impacts
5. Recommendations Addressing Impact Mitigation
6. Recommendations Addressing Monitoring
7. Recommendations Addressing Impact Modelling, Mapping, and Prediction

The Board further organized the recommendations based on the type of recommendation offered (e.g. establishing baseline, assessing effects, etc.) and the Board's expected timing of the implementation of the recommendation:

- to address irrespective of the current moratorium;
- to address prior to lifting the current moratorium;
- to address should the current moratorium be lifted; or
- to address through future assessments.

5. PARTIES RESPONSE

On March 23, 2020 the NIRB reached out to parties to request feedback on how Board's SEA recommendations have been addressed to date and plans for implementation moving forward. This deadline was extended to August 4, 2020 following a request from the GN on June 23, 2020 to extend the commenting period considering COVID-19. On July 20, 2020 the NIRB received a request from Environment and Climate Change Canada (ECCC) to extend the commenting period to August 21, 2020 due to staffing changes.

On or before August 21, 2020 the NIRB received comments from the following parties:

- Ministry of Fisheries, Hunting and Agriculture - Government of Greenland (APNN)
- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)
- Natural Resources Canada (NRCan)/Geological Survey of Canada (GSC)
- Fisheries and Oceans Canada (DFO), Canadian Coast Canada (CCG)
- Transport Canada (TC)
- Government of Nunavut (GN)
- Parks Canada Agency (PCA)
- Canada Energy Regulator (CER)
- World Wildlife Fund – Canada (WWF)

The NIRB further received comments from ECCC on August 27, 2020.

5.1 SUMMARY OF RESPONSES

Many parties commended the NIRB on the work undertaken during the SEA and the transparency of the process and final report. Parties commented on work currently and expected to take place related to the SEA, with many of these activities broken down by how they aligned with specific Board recommendations. Collaboration between parties, and specifically with Nunavut and

transboundary Inuit organizations and territorial, federal and transboundary governments, and non-governmental organizations and academic institutions was a common thread throughout the submissions. Within their respective submissions many parties identified needs for additional funding to carry out the Board's recommendations.

The key topics discussed by parties within comment submissions included, but are not limited to:

- Atmospheric and underwater sound and effects on marine species;
- Arctic petroleum basins and naturally occurring oil seeps;
- Hydrographic studies and geohazards (including landslides, earthquakes, and tsunamis);
- Coastlines;
- Sea ice;
- Bathymetry;
- Ecosystem structure and species distribution, benthic flora and fauna, marine mammals, migratory birds, fish and fish habitat and fisheries;
- Food security;
- Greenhouse gas emissions, climate change and climate impacts, and Canada's associated commitments and international obligations;
- National marine conservation areas and associated studies;
- Royalties and benefits;
- Emergency preparedness, prevention, and response (including spill modelling) and potential for spills in Greenland waters and need for safety precautions;
- Shipping (risk assessment and management);
- Inuit rights, Inuit Qaujimajatuqangit and Inuit Qaujimaningit;
- Developing a range of public guidance resources;
- Impact assessment and cumulative effects;
- Marine planning, marine monitoring and community-based monitoring;
- Requirements for oil and gas explorers and developers;
- Oil and gas priorities for the territory and potential for changing managing and responsibilities as relates to oil and gas development and regulatory initiatives;
- The five-year review of the moratorium on Arctic offshore oil and gas activities; and
- Economic alternatives to offshore oil and gas and technological alternatives.

Within their respective submissions, DFO/CCG, NRCan, PCA, TC, CER and WWF identified work currently being undertaken, planned or potential to be undertaken that would address 63/79 of the Board recommendations, with the following breakdown:

Recommendation Category	Recommendations Addressed	Parties ⁵
Recommendations Addressing Consultation, Coordination, and Public Engagement	1-5, 7, 8, 10, 11	DFO/CCG, PCA, TC, CER, WWF
Recommendations Addressing Regulatory, Royalty, and Benefits Regimes and Processes	12-17	DFO/CCG, PCA, TC, CER
Recommendations Addressing Baseline Research	19-38, 40-42, 45, 46	DFO/CCG, NRCan/GSC, PCA, TC, CER, WWF
Recommendations Addressing Assessment of Ecosystemic and Socio-Economic Impacts	47, 48, 50-54, 56, 57, 60	DFO, PCA TC, WWF
Recommendations Addressing Impact Mitigation	61-63	DFO, CER, WWF
Recommendations Addressing Monitoring	64, 66, 67	DFO/CCG, PCA
Recommendations Addressing Impact Modelling, Mapping, and Prediction	68, 69, 71, 74-77	DFO, PCA, CER, WWF

It was further noted that that the Board's Final SEA Report and associated recommendations are currently being considered by parties involved in the five-year review of the moratorium on offshore oil and gas activities in the Canadian Arctic both in terms of action plans to address the recommendations as well as using the outcomes to inform the review.

The following section provides a high-level summary of each response submission. The tables in Appendix A include a summary reference of work associated with each recommendation as identified by parties. For additional detail, please refer to the individual submissions available on the NIRB's public registry at <https://www.nirb.ca/project/125087>.

Government of Nunavut (GN; Public Registry No. 331221)

While the Government of Canada currently has authority over the management of offshore petroleum resources, the GN has significant interest in all matters respecting sustainable development in and around Nunavut. In August 2019, the *Nunavut Lands and Resources Devolution Agreement in Principle* was signed by the Government of Canada, the GN and Nunavut

⁵ Please note that not all parties identified work associated with each individual recommendation in each category.

Tunngavik Incorporated (NTI) which highlights a commitment from the three (3) parties to cooperate and coordinate regarding oil and gas management, administration, and development.

The GN noted that it was undertaking work related to:

- Naturally occurring oil seeps in the marine environment in Scott Inlet, Baffin Bay;
- Coastlines as part of the Nunavut Coastal Resource Inventory in Iqaluit, Pangnirtung, Qikiqtarjuaq, and Clyde River;
- Developing oil and gas priorities and a policy statement for Nunavut;
- Negotiating devolution with the Government of Canada and NTI, which is expected to lead to changes in the management, decision-making and sharing of resource revenues with respect to oil and gas development; and
- Participating in the five-year review of the federal oil and gas moratorium; including analyzing the SEA Report and prioritizing the Board's recommendations for consideration and discussion at the five-year review of the federal oil and gas moratorium, including a proposed action plan for priority items.

Crown-Indigenous Relations and Northern Affairs Canada (Public Registry No. 330671)

CIRNAC noted its involvement in various projects related to the SEA, highlighting:

- Funding the Qikiqtani Inuit Association's (QIA) work on Inuit Qaujimajatuqangit, including the continuance of the work being undertaken by the Inuit Qaujimajatuqangit Advisory Committee created for the SEA.
- CIRNAC-funded research into studies undertaken by the GN, Geological Survey of Canada (GSC), DFO, and ECCC. This work encompasses:
 - GN: oil seeps identification and geographical extent,
 - GSC: natural oil seeps activity, establishing the recurrence of and analyzing earthquakes, submarine landslides, and tsunamis linked to past earthquakes in eastern Baffin Island.
 - DFO: identifying, documenting, and or modelling subarctic and Arctic whale migration, range extent, life history, abundance, stock structure, feeding areas, relationship between movement and prey availability and cortisol concentration and increased vessel traffic (narwhal), predators and environment, competition, energy, reproduction, and threats. Considering both summer and overwintering habitat selection.
 - DFO: providing and documenting baseline information on spatio-temporal distribution of marine mammals, noise from anthropogenic sources, and sound

pressure levels in Baffin Bay to assess contribution of biological, anthropogenic, and environmental sources.

- DFO: addressing uncertainties in movements and distributions of walrus and narwhals that inhabit Baffin Bay and Davis Strait.
 - DFO: community-based monitoring programs of ‘unusual fish’ and sharing of public harvest data, knowledge, and technical information.
 - ECCC: identifying seasonal marine areas of high seabird abundance and diversity in Baffin Bay and Davis Strait and evaluating anthropogenic risks to Arctic seabirds (including offshore oil and gas).
 - ECCC: Analyzing baseline levels and assessing effects of oil-related contaminant exposure in marine species, including seabirds, in the Baffin Bay and Davis Strait region over the last 10 years.
- Activities part of science-based assessment to inform 5-year review of moratorium:
 - the SEA, along with SEA conducted in the Western Arctic, will be a key information source for the 5-year review of the moratorium in Canada’s Arctic offshore waters.
 - GSC Synthesis of Arctic Petroleum Basins (completed).
 - Assessment of greenhouse gas emissions associated with any potential activity, including life-cycle considerations and contributions to Canada’s commitments and international obligations (to be launched 2020).
 - Technical matters such as spill prevention and response (to be launched 2020).

Environment and Climate Change Canada (ECCC; Public Registry No. 331268)

ECCC’s specialist advice is provided in the context of legislation respecting environmental protection, pollution prevention provisions, species at risk (SAR), and migratory birds. ECCC provided an overview of some of the current activities it is undertaking in the area of sea ice, migratory birds, and climate change in relation to the SEA in Baffin Bay and Davis Strait:

- Sea ice: The Canadian Ice Service is currently updating baseline research on sea ice conditions (sea ice climatology; 1991-2020 data), which will encompass the Baffin Bay and Davis Strait area. This publication may be used as a tool to evaluate sea ice incursion risks and ice-free date projections in Baffin Bay (tentatively scheduled March 2021).
- Migratory Birds: ECCC updated the inventory of critical waterbird sites in Nunavut (report published 2018). Existing survey data was used to create maps of migratory birds and seasonal information of use in the Baffin Bay and Davis Strait region. Seasonal surveys are still required to describe inter-annual variation. Summaries of the resulting report (not yet published) have been delivered to communities in the Baffin Bay/Davis Strait region.

- In 2018, ECCC researchers, in coordination with hunters from local communities including Qikiqtarjuaq, collected tissue samples of four (4) seabird species to examine oil-related contaminants. Samples were collected specifically in and around two (2) National Wildlife Areas in the region that ECCC co-manages with Qikiqtarjuaq (see comment submission for additional information).
- Workshops expected for 2020/21 that will document different stressors to northern fulmars using cognitive mapping. This mapping method will allow for respectful inclusion of different knowledge systems.
- Climate Change: The Climate Research Division conducts research related to greenhouse gas observations, climate processes and cryosphere research, attribution and detection of climate trends and variability, development of earth system models for global and regional climate projections, and climate impact studies (list of publications related to the SEA is provided in the submission).

Fisheries and Oceans Canada and the Canadian Coast Guard (DFO, CCG; Public Registry No. 331043)

DFO outlined recommendations that align with its mandate [including the CCG and the Canadian Hydrographic Service (CHS)] and where progress has been made. The CCG is the lead federal response agency responsible for ensuring an appropriate response to all ship-source and mystery source pollution incidents in waters under Canadian jurisdiction. The CHS measures and describes the physical features of Canada's navigable waters and their marginal land areas to support safe and efficient navigation.

The following is a summary of work undertaken by DFO and the CCG associated with:

Recommendations Addressing Consultation, Coordination, and Public Engagement (1, 4, 5, 7, 8, 11)

- Depending on the status of the polluter, the CCG will advise and assume the role of Federal Monitoring Officer or Incident Commander in the event the polluter is known and able to respond or assume the overall management of the incident as On-Scene Commander or lead responder for a ship-source pollution incident in the event the polluter is unknown or unable to respond.
- CCG supports the GN terrestrial and marine spill response training and has partnered with the GN, Nunavut Fishing and Marine Training Consortium, Environment and Climate Change Canada and industry (AECOM) to develop training.
- CCG participates at the Arctic Council Emergency Prevention, Preparedness and Response (EPPR) Working Group, and helped support the Prevention, Preparedness and Response in Small Communities Project, focusing on planning, safety, coordination, action, and resources.

- Protection of the Arctic Marine Environment (PAME) working group of Arctic Council developed an Arctic-specific risk assessment tool for shipping (released 2020; see submission for additional information).
- CCG actively participates in several bilateral and multilateral agreements to ensure a timely and effective response(s) to transboundary emergencies (includes the United States and the Kingdom of Denmark).
- CCG will continue to implement the new Arctic Region in partnership with Inuit, First Nations, Métis, and Northern partners (including engaging on potential service delivery enhancements of programs).
- DFO is working with the QIA, relevant communities, and federal and territorial government departments to plan and develop the Tuvaijuittuq Marine Protected Area (Tuvaijuittuq MPA; includes a feasibility study) as well as the Sarvarjuaq initiative (Canadian portion of Pikialasorsuaq) in development with Greenland and the Kingdom of Denmark. Working with the QIA through the Sarvarjuaq initiative to advance Inuit leadership in marine conservation and planning.
- DFO will continue to provide expert advice to the Boards, GN, Inuit organizations, and communities which may support the development of common effect thresholds, and work toward establishment of co-management mechanisms.
- Co-authored a report with ECCC and PCA examining federal spatial management tools to advance marine and terrestrial planning.

Recommendations Addressing Regulatory and Benefits Regimes (12, 14, 17)

- DFO is exploring opportunities to develop an online information portal to support sharing marine spatial information (similar platform could host Inuit Qaujimagatuqangit and Inuit Qaujimaningit studies).
- DFO (Policy and Economics) noted potential to calculate food replacement costs for the value of fish and marine mammals for potentially impacted communities if adequate community harvest statistics available.
- DFO to seek additional guidance and advice to address cumulative effects for marine planning initiatives. Emphasis was placed on the development of community-based monitoring programs during advancement of Sarvarjuaq initiatives. CCG supports comprehensive cumulative effects assessments and is partners with TC who is running the Cumulative Effects of Marine Shipping pilot program in Cambridge Bay.

Recommendation Addressing Baseline Research (19, 21, 22, 25, 27, 29, 31, 32, 33-35, 37, 38, 40, 41, 45)

- DFO is currently funding/involved in: establishing baseline in open water conditions; multispecies and inshore fisheries assessment; inshore/offshore shrimp assessment; char assessment; ecosystem research in Baffin Bay/ Davis Strait (Knowledge and Ecosystem Based Assessment for Baffin Bay; KEBABB); coastal biodiversity studies in Milne Inlet and Frobisher Bay as part of Oceans Protection Plan (OPP) and port baseline studies (DFO AIS program); community based coastal research and monitoring being developed in Kinngait and Igloolik; data collection in Baffin Bay communities on the presence of salmon and other unusual fishes in coastal waters used for subsistence fishing; narwhal/ecosystem research in Tremblay Sound; ecological niche modelling to project range shifts; and collaborative research on the ArcticNet ArcticKelp project. Management measures addressing the impacts of environmental stressors (e.g. noise, nutrients etc.) on marine species are being examined.
- Arctic Aquatic Research Division (AARD) research includes limited ecosystem research in Baffin Bay and Davis Strait area on ecosystem structure and function with a focus on primary production (part of KEBABB). Species distribution modelling across the Canadian Arctic under climate change scenarios for native kelp and other northern species of concern (also under AARD).
- Baseline data will be used to identify sensitive (or critical habitat) for Species at Risk (SAR) that will be incorporated into marine planning. DFO is supporting advancement of marine planning in the Pikialasorsuaq/Sarvarjuaq area in the eastern Arctic under QIA leadership, examining potential management and international governance between Canada and Greenland (Denmark) of the region around the North Water Polynya. Geospatial information on ecological features and socio-economic activities is being collected and developed to inform management questions and decisions.
- Collaborating with QIA and PCA for the TINMCA to co-develop a complete science program for the TINMCA including species distribution modelling; expanding of KEBABB to Lancaster Sound; as well as supplying fisheries data and engaging with the five (5) adjacent communities to support commercial fisheries.
- Science advisory process for the Sarvarjuaq initiative (completed 2020) used available scientific and Inuit Qaujimajatuqangit to summarize current state of knowledge for the polynya and adjacent waters.
- In partnership with QIA, DFO is supporting additional Inuit Qaujimajatuqangit studies to inform the feasibility study to consider long-term protection for Tuvaijuittuq MPA and support informed management decisions by Inuit for Sarvarjuaq.
- DFO-Canadian Hydrographic Service (CHS) noted that 24.5% of the Area of Focus is surveyed to adequate or modern hydrographic standards, areas insufficiently surveyed are very deep and do not present a risk to navigation, further mitigating the urgency for modern hydrographic coverage.

- DFO is developing drift prediction and particle dispersion models to support emergency response. The CCG supports the recommendation to conduct baseline research to assess the capacity and infrastructure required to manage and respond to a well blowout or major spill in the Arctic, but noted that dedicated funding required to initiate a formal review process has not yet been secured.
- The CCG supports the DFO-led multi-partner research initiative as part of the OPP to support collaboration among leading national and international experts on oil spill research and response. It was noted that through collaboration with leading oil spill experts, oil spill response protocols and decisions to help minimize environmental impacts of oil spills can be improved.
- The CCG is seeking to participate in community- and territorial government-led process of Hazard Identification Risk Assessment and associated contingency planning by facilitating Community Action Plans to help address maritime pollution incidents. Community Action Plans would provide a communication strategy about what the CCG Environmental Response team needs to develop (i.e. tools and key messages) to ensure that the different communities in the region have a better understanding of their role and responsibilities in case of a spill.
- DFO is involved through the OPP in developing recommendations on noise thresholds, impacts and mitigation measures.
- DFO (Policy and Economics) could update harvest data and the economic values of subsistence harvest of fish and marine mammals at the community level.

Recommendations Addressing Assessment of Ecosystemic and Socio-Economic Impacts (48-51, 53, 54, 56, 57)

- DFO noted that additional resources would be required to address Board recommendation to research the relationship between changes in benthic flora and the marine environment. There is an ongoing project in Davis/Hudson Strait of fish that prey on shrimp to gain long-term insight into ecosystem variability, including impacts of climate change.
- Feasibility study for Tuvaijuittuq MPA includes compilation of baseline data, knowledge sources, and Inuit Qaujimajatuqangit to inform future management decisions (will also be done for future phases of the Sarvarjuaq initiative).
- DFO currently assesses potential impacts of development projects on fish and fish habitat, marine mammals and their habitat and provides expert advice to the NIRB as part of the environmental impact assessment processes in Nunavut.
- DFO will be developing a relocatable drift prediction model (science to support spill response, not mitigation) – application to the Arctic will begin in 2020.

- Ongoing work (e.g. Pikialasorsuaq, protected areas, conservation targets) includes processes to collect and synthesize existing knowledge in areas of potential interest for marine conservation. Planning is underway for a ship-based mission to the area in 2021-2022 in collaboration with the University of Manitoba.
- DFO noted fisheries baseline information can be provided as requested.

Board Recommendations in Relation to Impact Mitigation (62-64, 66)

- CCG supports the new Arctic Region in collaboration with northern partners; contingency planning and community action plans; and the DFO-led Multi-Partner Research Initiative (part of OPP) to support collaboration among leading national and international experts on oil spill research and response.
- Discussions around monitoring programs, community-based monitoring activities and research are underway for the Sarvarjuaq initiative, including community exchanges across the polynya with Greenlandic communities. DFO will support capacity development of communities to lead this initiative and will build off of other work done by environmental non-government organizations and academic partners in this region on community-based monitoring programs.
- CCG supports NTI's Inuit Marine Monitoring Program, which could be adapted to monitor oil and gas developments in the future should the moratorium be lifted.

Recommendations Addressing Impact Modelling, Mapping and Predictions (71, 75-78)

- Ongoing work and discussions on protected area includes the Canadian Science Advisory process on the state of knowledge of the Pikialasorsuaq.
- DFO suggested that baseline on atmospheric and underwater sound levels in Baffin Bay and Davis Strait, updated modelling and cumulative effects studies may be completed when enough baseline data is available.

Natural Resources Canada (NRCan; Public Registry No. 330827)

NRCan identified the following work being undertaken by the Geological Survey of Canada (GSC) associated with:

Recommendations Addressing Baseline Research (Nos. 22, 23, 42)

- Mapping extensive areas of the seafloor, with the hydrographic maps primarily used to identify marine geohazards on the seafloor and to ultimately increase safety of shipping in the region.
- Assessing natural oil seeps activity by analysing multibeam bathymetry and sediment samples. Establishing the recurrence of earthquakes in the Baffin region through dating of submarine landslides from collected sediment cores.

- Completed a literature review and desktop synthesis of Arctic Petroleum Basins to determine predicted resource potential. Refining estimates of the recurrence of submarine landslides and tsunamis linked to past earthquakes in eastern Baffin Island through mapping submarine landslides, assessing slope stability, monitoring active geohazards, and collecting sediment cores.

Parks Canada Association (PCA; Public Registry No. 331178)

The PCA noted it does not have responsibility for the authorization or management of oil and gas exploration or development within the SEA Area of Focus. However, the Nunavut Field Unit has responsibilities for the management and control of the Auyuittuq and Sirmilik national parks (associated with Pangnirtung, Qikiqtarjuaq, Pond Inlet, and Arctic Bay), and has joint management responsibilities with the QIA, DFO, and TC for the implementation of the Tallurutiup Imanga National Marine Conservation Area Impact and Benefit Agreement (TINMCA IIBA; associated with Clyde River, Grise Fiord, Pond Inlet, Arctic Bay, and Resolute Bay) in the area covered by the SEA. Additional information on PCA's research priorities for each park is available in the comment submission.

The PCA highlighted the following work summarized below reflecting the status of its commitments and activities relevant to SEA recommendations:

Recommendations Addressing Consultation, Co-ordination and Public Engagement (2-5, 7, 8, 10)

- TINMCA IIBA:
 - Both western science and Inuit science relied on, supported, collected and used, and monitoring priorities of each of the five (5) communities;
 - Support development of an Inuit Research and Monitoring Plan; research and monitoring requirements to provide social, cultural, economic and environmental benefits for Inuit;
 - Recognition that it is essential to support Inuit participation, involvement, capacity building and engagement in research and monitoring;
 - Management to consider multiple perspectives, reached through consensus decision-making, and reflect a shared vision respecting and integrating the knowledge and values of Inuit;
 - Will be involved in the review of any projects potentially impacting the protected areas under its jurisdiction; and
 - Create an Inuit advisory committee (Imaq) with community representation as a mechanism for the QIA to gain perspectives of Inuit in the associated communities and support QIA delivery of IIBA benefits and overall implementation of the TINMCA agreement.

Recommendations Addressing Regulatory, Royalty, and Benefits Regimes and Processes (12)

- Creation of Imaq, support the development of an Inuit Research and Monitoring Plan and ensure that Inuit led research and monitoring data is stored, used and shared consistently with intellectual property rights.

Recommendations Addressing Baseline Research and Impact Assessment (19-22, 24-31, 34-37, 41, 45)

- Work to inventory Auyuittuq and Sirmilik National Parks and associated IIBA.
- Research priorities for Auyuittuq National Park include describing the community structure of the marine ecosystems of the park's fiords.
- PCA's Cultural Resource Management Policy directs PCA to conduct inventories, evaluate historical significance, consider actions affecting conservation and presentation, and monitor to cultural resources to ensure conservation and presentation objectives are met.
- TINMCA Research and monitoring strategy requirements including research needs and priorities, training and capacity building, data management, infrastructure and human resources, principles, consistency with *Nunavut Agreement* and Canada's all rights and obligations under international law (see submission for additional detail).
- TINMCA Governance requirements of the Aulattiqatigiit Board (joint management board overseeing the management and operations of the TINMCA) and responsibilities to include procedures dealing with emergencies and public safety and threats to natural resources and cultural features.

Recommendations Addressing Assessment of Ecosystemic and Socio-economic Impacts (47, 48, 50, 56, 57)

- TINMCA IIBA:
 - Principles include preservation of Inuit cultural practices, expression and customs are supported and Inuit initiatives for cultural maintenance and renewal are encouraged in the establishment, management and operation of TINMCA.
 - Monitor threats to ecosystem and wildlife population, including from climate change;
 - Aulattiqatigiit Board to address development of recommendations respecting continuity of Inuit cultural uses, protection of sites of special and spiritual-cultural significance to Inuit, and renewable resource harvesting including wildlife harvesting.

Recommendations Addressing Mitigation, Monitoring, Modelling, Mapping and Prediction (66, 67-69)

- Addressed through previous responses.

Transport Canada (TC; Public Registry No. 331145)

TC's roles and responsibilities related to marine shipping in the Arctic are regulated by Acts and Regulations to provide Canada's operational regulatory regime governing marine safety, security and environmental protection matters. TC reviews projects related to oil and gas activities under the environmental assessment processes in Nunavut and provides subject matter expertise as required. TC further supports the CER and other federal departments by utilizing National Aerial Surveillance Program aircraft and provides technical advice on vessels in the event of an accident, including detecting ship-source oil pollution, and as relates to vessel operations/stability. TC noted that considering its role in offshore oil and gas activities, the NIRB's recommendations provide important considerations. TC further participates in the Oceans Protection Plan (OPP) and noted that the associated Cumulative Effects of Marine Shipping Initiative (conducted in Cambridge Bay) may support the Board's SEA recommendations.

TC highlighted the following work being undertaken associated with:

Recommendations Addressing Consultation, Coordination, and Public Engagement (1, 5, 11)

- Role in emergency preparedness and response regarding marine shipping. Through the OPP TC collaborates with its partners to strengthen existing emergency preparedness and response in the Arctic, including guiding an oil spill risk assessment through the Cumulative Effects Marine Shipping Initiative. TC would be available to support the CER and others in undertaking Board recommendations 1, 29, and 32.
- TC is currently a member of the Canadian delegation of various working groups established under the Arctic Council and is a long-time member of the Emergency Prevention, Preparedness and Response Working Group (EPPR). In 2020, the Working Group released a Guideline for Arctic Marine Risk Assessment, a web-based tool for conducting Arctic marine risk assessments with focus on creating a common ground and incorporating unique Arctic risk factors.

Recommendations Addressing Regulatory and Benefits Regimes (14)

- TC administers the *Marine Liability Act*, a mechanism to provide compensation for economic impacts due to an oil spill from ships, including subsistence fishing and harvesting (see submission for additional information on marine liability and compensation).

Recommendations Addressing Baseline Research (21, 22, 29, 31-33, 45)

- Signatory to the Tallurutiup Imanga National Marine Conservation Area Inuit Impact and Benefit Agree (TINMCA IIBA; in force 2019) and member of the Aulattiqatigiit board, a joint Inuit and Canada management board, where the Parties work together in reaching consensus to guide management of TINMCA.

- Noted the department could evaluate bathymetry research (undertaken by another organization) in terms of navigational risks.
- Role in emergency preparedness and response in relation to marine shipping and collaboration of oil spill risk studies conducted through the OPP and the Cumulative Effects Marine Shipping Initiative (the latter does not focus on oil and gas activities). It was noted the latter could contribute to a broader understanding of the impacts of shipping on marine mammals.

Recommendations Addressing Assessment of Ecosystemic and Socio-Economic Impacts (54)

- Notes that information gathered through the Cumulative Effects of Marine Shipping Initiative could contribute to a broader understanding of the impacts of shipping on marine mammals and the response regime.

Canada Energy Regulator (CER; Public Registry No. 331191)

The CER is the lead federal agency for offshore Arctic oil and gas activities including overseeing spill and emergency response capabilities, technologies, infrastructure and response plans for installations, vessels and equipment actively engaged in oil and gas activities. The CER noted that many of the Board's recommendations are in alignment with its existing expectations for companies conducting oil and gas activities in the Canadian Arctic. It was further recognized that there may be additional recommendations in which the CER may have a role in the future.

The CER highlighted the following work summarized below being undertaken and highlighted opportunities for future work and collaboration associated with:

Recommendations Addressing Consultation, Coordination, and Public Engagement (1, 5, 8, 11)

- Would lead partnership with TC, CCG, ECCC, GN, Inuit Organizations, and CIRNAC to develop accessible public guidance on the roles and responsibilities of Nunavut stakeholders for oil and gas spill response within the Nunavut Settlement Area (NSA) and in the Canadian offshore adjacent to the NSA. Oil and gas exploration and development companies are responsible for their own responses to oil and gas spills/releases related to their oil and gas activities.
- Part of the Canadian delegation for the Arctic Council's EPPR Working Group, including the Marine Environmental Response Experts Group, and participates in the Arctic Offshore Regulators Forum and intends to continue to be involved in international coordination/cooperation efforts (see submission for additional expectations).
- Aside from involvement in the Environmental Studies Research Fund, the CER is not directly involved in research. Interest was expressed in co-developing tailored community "toolkit" materials to support community members becoming involved in regulatory processes associated with the assessment of any potential oil and gas activities.

- Proponents are expected to assess cumulative and transboundary effects for individual oil and gas projects and to work with Inuit residents in the development of their assessment and proposed projects. Additional expectations are available in the submission.

Recommendations Addressing Regulatory and Benefits Regimes (13-17)

- While the CER is not directly involved in royalties and benefits, it expects companies to develop compensation frameworks with Inuit related to potential interference from a proposed project on Inuit harvesting or damage to marine wildlife or wildlife habitat. Other avenues for obtaining compensation were noted, some which are under the purview of the CER and others that are not, such as the Ship-source Oil Pollution Fund which is administered by an appointee of the Governor in Council. The CER offered to lead the co-development of a backgrounder on compensation with other federal partners outlining the different means of obtaining compensation.
- Companies are expected to recognize Inuit rights, Inuit Qaujimajatuqangit and Inuit Qaujimaningit and analyze potential impacts to Inuit harvesting and Inuit rights, cumulative effects, and identify predicted benefits and impacts on the region and potentially affected communities.
- Companies must actively engage, consult and collaborate with all relevant parties including Inuit knowledge holders and Nunavut communities (additional information in submission).

Recommendations Addressing Baseline Research (29, 31, 32)

- Would take the lead in developing accessible public guidance on the roles and responsibilities of Nunavut stakeholders for oil and gas spill response.
- Interest expressed in participating in review of existing capacity to respond effectively to a major oil spill in the Area of Focus.
- Discussed the focus of the National Energy Board's (now CER) Review of Offshore Drilling in the Canadian Arctic and noted interest in new information arising from additional research and expectations for companies to use new information as available (see submission for additional details).

Recommendations in Relation to Impact Mitigation (63)

- Oil and gas explorers and developers are expected to use all available information on accidents and malfunctions in similar jurisdictions to inform the development of their emergency response plans, spill contingency and prevention plans, standard operating procedures, and mitigation measures. Robust management systems that implement continual improvement feedback loops are further expected.

Recommendations Addressing Impact Modelling, Mapping and Predictions (76, 77, 78)

- Companies are expected to describe how setbacks and development restrictions are considered in their application to conduct oil and gas activities.

World Wildlife Fund-Canada (WWF; Public Registry No. 331213)

The WWF is an independent conservation organization and is working in partnership with coastal communities, Indigenous peoples and other groups to advocate for marine protected areas and sustainable oceans management, and to ensure the rules governing offshore oil and gas activities are consistent with international best practices for safety, accountability and environmental protection. The WWF commended the NIRB for its detailed and comprehensive final report and noted it concurred with the Board's central conclusion. WWF added that another SEA process would be required to compare the viability of other development options before any oil and gas activities take place in the region.

The WWF highlighted the following summarized research and projects being undertaken:

Recommendations Addressing Consultation, Coordination, and Public Engagement (4, 5)

- Exploring how to help initiate more integrated marine planning in Nunavut.
- Supported development of the Community Marine Oil Spill Response Action Plan with Resolute, which focuses on a localized initial response and does not include transboundary emergency preparedness.

Recommendations Addressing Baseline Research (19, 25, 27, 29, 40, 41, 46)

- Supporting University of Windsor research to track and understand Greenland halibut movement between inshore environments and the offshore areas of Baffin Bay and Davis Strait, and the North-South movement of Greenland halibut in Baffin Bay and Davis Strait.
- Researched and identified significant spill response gaps in the Canadian Arctic and has detailed equipment and emergency response planning requirements. Developed a spill response emergency preparedness plan and best practices guide for Resolute.
- Planning to produce a report on economic alternatives to oil and gas development in the Canadian Arctic.
- Co-sponsoring with WWF Arctic Programme (global in focus) a project at the Arctic Council's Protection of the Arctic Marine Environment (PAME) working group to develop shipping acoustic underwater noise maps for Canada and the entire pan-Arctic and then possibly measures to reduce noise impacts. Provided input and funding for PAME to conduct a state of knowledge report on shipping underwater noise pollution for the global Arctic.

- WWF's analyses of upstream and downstream climate impacts (external research) indicated it is highly unlikely that Arctic oil development would be consistent with global emissions targets under the Paris Agreement.

Recommendations Addressing Assessment of Ecosystemic and Socio-Economic Impacts (51, 52, 60)

- Planning to release the Canadian Arctic Marine Priority Areas for Conservation (CanPAC) report identifying a network of priority areas for species and habitat conservation.
- Working to demonstrate that low-impact renewable energy from wind and solar is possible and can contribute to the sustainable development of Nunavut.
- Conducted research suggesting that marine vibroseis is a viable alternative to seismic testing and less harmful to marine wildlife while producing similar data results.

Recommendations in Relation to Impact Mitigation (61)

- Input into the Frontier and Offshore Regulatory Renewal Initiative, including recommended regulatory reforms.

Recommendation Addressing Impact Modelling, Mapping and Predictions (69, 71, 74)

- Its future CanPAC report will include maps that could be used for providing up-to-date online maps of sensitive habitats for the Area of Focus to some extent. Report will include information on where establishment of Marine Protected Areas may be appropriate – including but not specifically focused on SAR.
- Conducts research on greenhouse gas emissions from shipping, indicating that the industry is an important contributor to Canadian and global emissions. No data on shipping emissions associated with oil and gas development specifically.

Ministry of Fisheries, Hunting and Agriculture – Government of Greenland (APNN; Public Registry No. 330566)

Within its submission, the APNN emphasized that:

- Increased risk of spillage and potential subsequent damage to the surrounding marine environment from offshore oil and gas activities and the need for safety precautions.
- Greenland's most important occupation is fishing, and that fishing and hunting are both major contributors to the subsistence use of marine resources. APNN found the SEA recommendations positive and that the SEA supports any transboundary effects assessments.

- Oil, gas spillage, and noise pollution can have an essential impact on living resources in general as well as on specific wild animals. It was noted that it was not acceptable if the SEA activities in Baffin Bay and Davis Strait include compromising levels of noise.

6. CONCLUSION

On March 23, 2020 the NIRB reached out to parties to request feedback on how Board recommendations have been addressed to date and plans for implementation moving forward associated with the SEA. By August 27, 2020 the Board had received comment submissions from the territorial government, federal government departments and organizations, an environmental non-governmental organization, and the Government of Greenland. The SEA was truly a collaborative effort that would not have been possible without the significant and ongoing contributions of parties and the NIRB appreciates the continued and active participation of parties into the SEA.

A common theme throughout the submissions was collaboration of parties and focus on community involvement and Inuit Qaujimajatuqangit. The key topics discussed by parties within comment submissions included, but are not limited to:

- Air quality
- In air and underwater acoustic environment and effects on marine species
- Geology
- Coastal landforms and coastlines
- Sea ice
- Benthic flora and fauna
- Fish and fish habitat, waterbirds, marine mammals, and species at risk (SAR)
- Fisheries
- Food security
- Greenhouse gas emissions, climate change and climate impacts
- Emergency preparedness, prevention, and response
- Shipping
- Inuit rights, Inuit Qaujimajatuqangit and Inuit Qaujimaningit
- Marine planning, marine monitoring and community-based monitoring
- Offshore oil and gas requirements and regulatory regime

- National Marine Conservation Areas
- Economic alternatives to offshore oil and gas

The NIRB understands that the Board's Final SEA Report and associated recommendations are currently being considered by parties involved in the five-year review of the moratorium on offshore oil and gas activities in the Canadian Arctic both in terms of action plans to address the recommendations as well as using the outcomes to inform the review. While the NIRB will continue to track how the Board's recommendations are being addressed, the frequency of updates will not necessarily be on an annual basis.

APPENDIX A

TABLE 1: SUMMARY OF BOARD RECOMMENDATIONS ADDRESSING CONSULTATION, CO-ORDINATION, AND PUBLIC ENGAGEMENT

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
1	4.2 Spill Response Regime 8.9 Accidents and Malfunctions 9.0 Other Matters Considered by the Board	Gaps and Uncertainty	Building on the data collected in Recommendation #29, develop accessible public guidance on the roles and responsibilities of Nunavut stakeholders (Federal agencies, Government of Nunavut, Inuit organizations, and communities) for oil and gas spill response within the Nunavut Settlement Area and in the Canadian offshore adjacent to the Nunavut Settlement Area.	DFO/CCG, TC, CER	<p>CCG: Ensures appropriate response as Federal Monitoring Officer and Incident Commander or On-Scene Commander depending on situation. Implementing new Arctic Region in partnership with Inuit, First Nations and Métis, and Northern partners. Supports GN terrestrial and marine spill response training.</p> <p>TC: Role in emergency preparedness and response for marine shipping. Part of existing emergency preparedness and response in the Arctic through OPP. Guides an oil spill risk assessment process through the Cumulative Effects of Marine Shipping Initiative.</p> <p>CER: Lead federal agency for Arctic oil and gas activities. Partners with TC, CCG, ECCC, GN, Inuit Organizations and</p>

					CIRNAC and would lead any development of accessible public guidance on the roles and responsibilities of Nunavut stakeholders for oil and gas spill response within the NSA and in the Canadian offshore adjacent to the NSA.
2	5.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimagatuqangit	Work with communities to develop the criteria and indicators that should be relied upon to assess community health and well-being, which respect Inuit Qaujimagatuqangit and Inuit Qaujimaningit.	PCA	PCA: TINMCA IIBA use of both western science and Inuit science and research and monitoring priorities of each of the five (5) communities
3	7.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimagatuqangit	Conduct research in consultation with the Qikiqtani Inuit Association, Government of Nunavut and communities in the Area of Focus to identify the potential for oil and gas development to have impacts on Inuit culture, heritage, and rights.	PCA	PCA: TINMCA IIBA Support development of an Inuit Research and Monitoring Plan
4	7.3 Human Environment 9.0 Other Matters Considered by the Board	Marine Planning	The Government of Nunavut, Nunavut Tunngavik Incorporated, the Qikiqtani Inuit Association, marine users (including commercial and traditional harvesters), and the	DFO, PCA, WWF	DFO: Working with QIA, PCA, GN to plan and develop Tuvaijuiituaq MPA and Sarvarjuaq initiative (Canadian portion of Pikialasorsuaq). Feasibility assessment for Tuvaijuiituaq MPA to include community

			communities in the Area of Focus should be included as active participants in all marine planning with the potential to affect the Canadian offshore waters of Baffin Bay and Davis Strait.		<p>consultations. With QIA, Sarvarjuaq initiative working to advance Inuit leadership in marine conservation and planning through. Working with Greenland and the Kingdom of Denmark to explore bi-national management.</p> <p>PCA: Management of TINMCA to consider multiple perspectives, consensus decision-making, and reflect a shared vision respecting and integrating the knowledge and values of Inuit.</p> <p>WWF: Exploring how to help initiate more integrated marine planning in Nunavut.</p>
5	8.9 Accidents and Malfunctions 9.0 Other Matters Considered by the Board	Marine Planning	All parties with responsibilities for emergency response in the Area of Focus, including the communities in the region, should establish relationships with other circumpolar nations and transboundary groups to support active and timely coordination with these groups to enhance transboundary emergency preparedness and response capabilities.	DFO, PCA, TC, CER, WWF	<p>DFO: Participates in several bilateral and multilateral agreements to respond to transboundary emergencies (includes United States and Kingdom of Denmark and joint responses).</p> <p>PCA: See Recommendation 29</p> <p>TC: Member of the Canadian delegation to the Arctic Council, and on EPPR Working Group.</p>

					<p>CER: Part of Canadian delegation for the Arctic Council's EPPR Working Group, Marine Environmental Response Experts Group, and participates in the Arctic Offshore Regulators Forum.</p> <p>WWF: Supported the development of a <i>Community Marine Oil Spill Response Action Plan</i> with the community of Resolute.</p>
Recommendations to address prior to lifting the current moratorium					
6	2.11 Community Engagement 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit	Timely, predictable, and adequate participant funding should be provided for all future Strategic Environmental Assessments and project-specific assessments to facilitate active participation by Nunavut communities, Inuit organizations, local hunters and trappers organizations, interested individuals, and other interested groups.		
7	7.6 Transboundary Effects 9.0 Other Matters Considered by the Board	Marine planning	Opportunities should be pursued to establish relationships and develop decision-making processes with neighboring jurisdictions and the	DFO, PCA	DFO: Will continue to provide expert advice to the Boards, GN, Inuit organizations, and communities.

			Government of Nunavut, Inuit Organizations, and communities, in support of developing common thresholds to assess effects from oil and gas development, to develop appropriate regulatory oversight of the industry, and to establish co-management mechanisms to address transboundary effects.		PCA: Will be involved in the review of any projects potentially impacting the protection areas under its jurisdiction.
Recommendations to address should the current moratorium be lifted					
8	2.11 Community Engagement 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit Marine Planning	In consultation with communities, relevant regulatory authorities should prepare community “toolkit” materials in plain language and general terms, which support community members becoming involved in research conducted in the Area of Focus and in the regulatory and marine planning processes associated with potential future oil and gas development in the Area of Focus.	DFO, CCG, PCA, CER	<p>DFO: Co-authored report examining various federal spatial management tools to advance marine and terrestrial planning. MPA network planning by PAME.</p> <p>CCG: Participates in Arctic Council EPPR Working Group and helped support Prevention, Preparedness and Response in Small Communities project.</p> <p>PCA: See Recommendation 3.</p> <p>CER: Generally, not directly involved in research. Interested in co-developing tailored community “toolkit” materials to</p>

					support involvement of community members in regulatory processes for potential oil and gas activities.
9	7.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit	The oil and gas development industry should establish communication strategies and foster working relationships with communities prior to the presentation of specific development proposals.		
10	7.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit	Based on the results of the research conducted under #3, opportunities should be identified to support programs to limit negative impacts on Inuit culture, heritage, and rights (e.g., cultural training programs, including “On the Land Programs” for youth, Elder engagement, Inuit mentorship programs, etc.)	PCA	PCA: TINMCA IIBA create an Inuit advisory committee (Imaq).
Recommendations to address through future assessments					
11	7.6 Transboundary Effects 9.0 Other Matters Considered by the Board	Marine Planning	Future assessments and marine planning should include comprehensive transboundary effects assessments of valued environmental components and collaboration with Inuit residents in transboundary	DFO, CCG, TC, CER	DFO: Supporting marine planning in the Pikialasorsuaq. This is an Inuit-led process. CCG: New Arctic-specific risk assessment tool for shipping released in 2020 under Arctic Council EPPR Working Group.

			areas outside the Nunavut Settlement Area (e.g., Nunavik, Greenland, etc.) should occur whenever practical.		<p>TC: In 2020, the EPPR Working Group developed and released a Guideline for Arctic Marine Risk Assessment.</p> <p>CER: Expects proponents to assess cumulative and transboundary effects of VEC's and to work with Inuit residents in the development of their assessment and proposed projects.</p>
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Table 2: Summary of Board Recommendations Addressing Regulatory and Benefits Regimes

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
12	7.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit	Develop an Inuit-led process to establish an accessible and central holding place in Nunavut to support the gathering and sharing of Inuit Qaujimajatuqangit and Inuit Qaujimaningit studies.	DFO, PCA	<p>DFO: Potential for online information portal to support sharing marine spatial information. Inuit Qaujimajatuqangit and Inuit Qaujimaningit studies could also be hosted on such a platform.</p> <p>PCA: TINMCA creation of Imaq (Inuit Advisory Committee); Inuit Research and Monitoring Plan; and ensure consistency with intellectual property rights.</p>

Recommendations to address prior to lifting the current moratorium					
13	4.1 Regulatory Regime 9.0 Other Matters Considered by the Board	Gaps and Uncertainty	<p>Clear descriptions should be developed to explain the royalties and benefits regime applicable to:</p> <ul style="list-style-type: none"> oil and gas developments occurring exclusively in the Canadian offshore adjacent to the Nunavut Settlement Area; and oil and gas developments occurring in the Canadian offshore adjacent to the Nunavut Settlement Area which are supported by land-based infrastructure within the Nunavut Settlement Area. <p>This analysis should clarify the extent to which <i>Canada Oil and Gas Operations Act</i> benefits can be accrued in Nunavut and specify the framework that would apply to compensation for interference with Inuit harvesting or damage to marine wildlife or wildlife</p>	CER	CER: Not directly involved in royalties and benefits. Expects companies to develop compensation frameworks with Inuit and analyze potential impacts to Inuit harvesting and Inuit rights. Offered to lead the co-development of a backgrounder on compensation with other federal partners outlining the different means of obtaining compensation. Other avenues for participation (e.g. Ship-source Oil Pollution Fund).

			habitat (within the Canadian offshore and the Nunavut Settlement Area).		
14	4.1 Regulatory Regime 7.3 Human Environment 9.0 Other Matters Considered by the Board	Gaps and Uncertainty	Potential impacts to Inuit harvesting and Inuit rights (including threats to food security) should be considered when developing and implementing compensation frameworks for impacts on marine fish, waterbirds, and marine mammals.	DFO, TC, CER	DFO: Potential to calculate food replacement costs for the value of fish and marine mammals for potentially impacted communities. TC: TC administers the <i>Marine Liability Act</i> . Additional information provided regarding marine liability and compensation for oil spills. CER: See Recommendation 13.
Recommendations to address through future assessments					
15	4.1 Regulatory Regime 9.0 Other Matters Considered by the Board	Marine Planning; Gaps and Uncertainty	Assessments of proposed oil and gas projects should clearly identify the predicted benefits and potential compensation accruing to the region and potentially affected communities	CER	CER: See Recommendation 13.
16	4.1 Regulatory Regime 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit	Structure future assessments conducted in, or adjacent to, the Nunavut Settlement Area and associated decision-making processes with the express recognition of Inuit rights, Inuit Qaujimajatuqangit and Inuit Qaujimaningit, and the	CER	CER: Project applications expected to recognize Inuit rights, Inuit Qaujimajatuqangit and Inuit Qaujimaningit and to include comprehensive cumulative effects assessments. Companies are required to actively engage, consult and collaborate with all relevant parties including Inuit

			requirement to actively engage with Inuit knowledge holders and Nunavut communities.		knowledge holders and Nunavut communities.
17	7.5 Cumulative effects 9.0 Other Matters Considered by the Board	Marine Planning	The scope of future assessments and marine planning must include comprehensive cumulative effects assessments for valued ecosystemic and socio-economic components, including food security. Collaboration and input should be sought from all relevant parties and be informed by community-based monitoring programs.	DFO, CCG, CER,	DFO: Additional guidance and advice to address cumulative effects on VECs for current or future marine planning initiatives. Discussions to advance the Sarvarjuaq initiative emphasized development of community-based monitoring programs. CCG: Partners with TC, running pilot program on cumulative effects of marine shipping in Cambridge Bay. CER: See Recommendation 16.
18	7.7 Effects of the Environment 9.0 Other Matters Considered by the Board	Lack of Readiness	All specific oil and gas development proposals should demonstrate that: <ul style="list-style-type: none"> ▪ adaptive management approaches are incorporated into the project; ▪ the project design and equipment used will maintain safety, integrity, and reliability even in the harsh and rapidly-changing 		

			environmental conditions of Baffin Bay and Davis Strait.		
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TABLE 3: SUMMARY OF BOARD RECOMMENDATIONS ADDRESSING BASELINE RESEARCH

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
19.	5.4 Climate Change	Gaps and Uncertainty	<p>Collect baseline information and undertake assessments of the current and predicted effects of climate change in the Arctic, including direct and indirect impacts:</p> <ul style="list-style-type: none"> ▪ on the physical environment (e.g., marine currents, fog, and precipitation), ▪ on the biological environment (e.g., wildlife migration patterns); and ▪ on the human environment (e.g., changes to wildlife availability and effects on harvesting, changes to ranges and availability of fish species and effects on 	DFO, PCA, WWF	<p>DFO: Limited ecosystem research in Baffin Bay and Davis Strait area to support ecosystem approach to fisheries management (to expand to Lancaster Sound to support the TINMCA). Developing a complete science program for the TINMCA with QIA and PCA. Species distribution for native kelp and other northern species of concern by AARD. Science Advisory Process using available scientific and Inuit Qaujimajatuqangit completed for Sarvarjuaq initiative (2020).</p> <p>PCA: TINMCA Research and Monitoring Strategy requirements.</p> <p>WWF: Supporting University of Windsor research to track and</p>

			commercial harvesting, etc.).		understand Greenland halibut movement.
20.	5.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit Gaps and Uncertainty	Ensure that all baseline research, data collection, effects assessment, and updating conducted in the Area of Focus includes consultations with Inuit knowledge and rights holders and consideration of Inuit Qaujimajatuqangit and Inuit Qaujimaningit.	PCA	PCA: See Recommendations 19 and 12.
21.	5.3 Human Environment 9.0 Other Matters Considered by the Board	Inuit Qaujimajatuqangit; Gaps and Uncertainty	In consultation with the Qikiqtani Inuit Organization and communities in the Area of Focus, ongoing research programs should be prioritized to continue the gathering of Inuit Qaujimajatuqangit and Inuit Qaujimaningit regarding the marine environment and offshore areas in Baffin Bay and Davis Strait from Inuit knowledge holders in the communities in the Area of Focus.	DFO, PCA, TC	DFO: Supporting additional Inuit Qaujimajatuqangit studies to inform the feasibility study to consider long-term protection for Tuvaiguiit MPA and support informed management decisions by Inuit for Sarvarjuaq Initiative. PCA: See Recommendations 19 and 20. TC: Signatory to the TINMCA Inuit Impact and Benefit Agree and member of the Aulattiqatigiit board.
22.	5.1 Physical Environment	Gaps and Uncertainty	Conduct additional bathymetry research to identify navigational hazards in the Area of Focus and to improve the safety of shipping in the region.	NRCan (GSC), DFO (Canadian Hydrographic Service), PCA, TC	GSC: Hydrographic mapping to identify marine geohazards (contributing to recommendation no. 42).

					<p>DFO (CHS): Considerable areas in Area of Focus insufficiently surveyed are very deep and do not present a risk to navigation.</p> <p>PCA: See Recommendations 19 and 20.</p> <p>TC: Could evaluate bathymetry research regarding navigational risks (if collected by another organization).</p>
23.	5.1 Physical Environment	Gaps and Uncertainty	<p>Conduct research to:</p> <ul style="list-style-type: none"> ▪ identify naturally occurring oil and gas seep locations in the Area of Focus; and ▪ determine flow rates and other relevant characteristics. 	NRCan (GSC)	<p>GSC: Multibeam bathymetry and sediment samples to analyze natural oil seeps. Dating of submarine landslides from collected sediment cores to establish recurrence of earthquakes.</p>
24.	5.2 Biological Environment;	Gaps and Uncertainty	<p>Conduct research in the Area of Focus to improve understanding of:</p> <ul style="list-style-type: none"> ▪ marine plankton, including abundance, diversity and biomass; and ▪ benthic flora and fauna, including their respective biologies and ecologies. 	DFO, PCA	<p>DFO: Assessment of marine plankton and benthic flora and fauna through KEBABB, coastal biodiversity studies in Milne Inlet and Frobisher Bay as part of OPP port baseline studies (AIS program), and collaborative research on the ArcticNet ArcticKelp project.</p> <p>PCA: See Recommendations 19 and 20.</p>

25.	5.2 Biological Environment	Gaps and Uncertainty	<p>Collect additional baseline data and undertake research in Baffin Bay and Davis Strait on:</p> <ul style="list-style-type: none"> ▪ fish and fish habitat (including spawning grounds, nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly to carry out their life processes); ▪ waterbirds; and ▪ marine mammals. <p>This research should be designed to improve the understanding of current status and potential for development activities to impact important populations and sensitive habitats. Research efforts should also include consideration for the effects of climate change and pollution and should focus on: population densities, distribution, abundance, and breeding success; monitoring of seasonal migration patterns and key</p>	DFO, PCA, WWF	<p>DFO: Funding/involved in: fisheries assessments, ecosystem research (KEBABB), coastal biodiversity studies, and narwhal/ecosystem research in Tremblay Sound. With co-management organizations DFO also manages in-shore and offshore multi-species fisheries and various marine mammal fisheries within the Baffin Bay and Davis Strait area.</p> <p>PCA: See Recommendations 19 and 20.</p> <p>WWF: Supporting University of Windsor research to track and understand Greenland halibut movement. Could provide additional insight into spawning grounds.</p>
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			habitat use; sensitive breeding and foraging habitat, including habitat used during winter conditions (e.g., polynyas); productivity; and prey abundance and distribution, include connections between species and other trophic levels (e.g., connections between plankton, fish, water birds, and marine mammals) .		
26	5.3 Human Environment; 7.3 Effects on the Human Environment	Gaps and Uncertainty Inuit Qaujimajatuqangit	<p>With the direction and participation of the Qikiqtani Inuit Association and the 10 communities in the region, support further research into the role of harvesting in the marine environment, including:</p> <ul style="list-style-type: none"> ▪ the importance of harvesting on food security in communities; ▪ community-specific food security vulnerability ▪ the costs of harvesting; and 	PCA	PCA: See Recommendations 19 and 20.

			<ul style="list-style-type: none"> importance of country food sharing in communities. 		
27	5.3 Human Environment	Gaps and Uncertainty; Alternatives	<p>Collect baseline fisheries and ecosystem data to assess the commercial and ecosystemic viability of existing and potential expansions to the commercial fisheries in Baffin Bay and Davis Strait, including consideration of:</p> <ul style="list-style-type: none"> turbot migratory patterns, spawning grounds, and stock connectivity with inshore waters in Nunavut and Greenlandic waters; the viability of harvesting additional species (e.g., clams, Porcupine crab, redfish, etc.); required investments in technology; and increases to local quotas. 	DFO, PCA, WWF	<p>DFO: Supplying fisheries data, engaging with communities adjacent to TINMCA to explore fisheries potential, and funding opportunities to further support investment in commercial fisheries and technology.</p> <p>PCA: See Recommendations 19 and 20.</p> <p>WWF: See Recommendation 25.</p>
28	5.3 Human Environment	Gaps and Uncertainty	Conduct a baseline assessment of heritage resources along the	PCA	PCA: See Recommendations 19 and 20.

			coastlines of eastern Baffin Island, Ellesmere Island, and associated islands to identify archaeological and paleontological resources that could be impacted by potential effects from offshore development activities.		
29	8.9 Accidents and Malfunctions; 4.2 Spill Response Regime	Marine Planning	<p>Assemble available information on emergency preparedness and response, including:</p> <ul style="list-style-type: none"> ▪ current regulatory oversight and responsibilities; ▪ current and required response capabilities for the Area of Focus; ▪ spill response technologies applicable to the Arctic (in both ice and open water); ▪ emergency response infrastructure; and ▪ best practices and measures for emergency prevention and response. 	DFO, CCG, PCA, TC, CER, WWF	<p>DFO: Developing relocatable drift prediction and particle dispersion models (2020) and particle dispersion models developed for emergency ballast exchange zones could inform emergency response.</p> <p>CCG: Will continue to implement new Arctic Region and engaging to ensure needs of northern communities met.</p> <p>PCA: TINMCA Governance requirements and responsibilities regarding procedures for addressing emergencies.</p> <p>TC: See Recommendation 1.</p> <p>WWF: Identified significant spill response gaps in the Canadian Arctic and has detailed equipment and emergency</p>

					<p>response planning requirements. Developed a spill response emergency preparedness plan for Resolute, including a best practices guide.</p> <p>CER: See Recommendation 1.</p>
30	5.1 Physical Environment	Marine Planning	Conduct baseline research on sea ice conditions, including sea ice characteristics, iceberg presence and distribution and the effects of climate change on sea ice distribution.	PCA	PCA: See Recommendations 19 and 20.
Recommendations to address prior to lifting the current moratorium					
31	4.2 Spill Response Regime 8.9 Accidents and Malfunctions	Lack of Readiness; Marine Planning	Building on the data collected in Recommendation #29, initiate a formal review of the existing capacity to respond effectively to a major spill of oil in the Area of Focus, highlighting the expected role of communities and community capacity in responding to emergencies. The Government of Nunavut, Designated Inuit Organizations, and Nunavut communities should be	CCG, PCA, TC, CER	<p>CER: Interested in a review of capacity related to oil and gas spills resulting from oil and gas activity prior to that activity commencing. Reference to Development of <i>Review of Offshore Drilling in the Canadian Arctic</i>.</p> <p>PCA: See Recommendation 29.</p> <p>TC: Cumulative Effects of Marine Shipping Initiative could contribute to a broader understanding of the impacts of shipping on marine mammals and response regime.</p>

			actively engaged through the review process.		CCG: Supports this recommendation; dedicated funding to initiate a formal review process not yet secured.
32	4.2 Spill Response Regime 8.9 Accidents and Malfunctions	Gaps and Uncertainty; Lack of Readiness	Conduct baseline research to assess the capacity and infrastructure required to manage and respond to a well blowout or major spill in the Arctic and to determine whether an effective response can be mounted in remote locations under harsh weather conditions with periods of prolonged darkness and in the presence of ice.	CCG, TC, CER	CCG: Multi-partner research initiative (OPP) funded to support collaboration among leading national and international experts on oil spill research and response. Oil spill response protocols and decisions can be improved through collaboration. TC: See Recommendation 1. CER: See Recommendation 31.
33	4.2 Spill Response Regime 8.9 Accidents and Malfunction 7.2 Effects to Biological Environment	Gaps and Uncertainty	Conduct additional research to identify the potential effects of oil and gas activities and unplanned events (e.g., ice breaking, vessels, spills) on sensitive areas, including consideration of changing conditions associated with climate change.	DFO, CCG, TC	DFO: Research on impacts of ship traffic on narwhal movements and behaviour in Tremblay Sound, and on coastal biodiversity of marine plankton and benthic flora and fauna in Milne Inlet and Frobisher Bay. Ecological niche modelling to project range shifts. Expert advice provided to PAME review on baseline of underwater noise in Arctic regions. CCG: See response to Recommendation 32.

					TC: See recommendation 31.
34	5.1 Physical Environment	Gaps and Uncertainty	Conduct baseline research to improve understanding of oceanographic processes in Baffin Bay and Davis Strait during ice-covered and open-water conditions. This baseline information should be used to inform analysis of potential environmental effects and oil spill modeling.	DFO, PCA	DFO: Ongoing projects documenting baseline information during open-water conditions. PCA: See Recommendations 19 and 20.
35	5.1 Physical Environment	Gaps and Uncertainty	Undertake research to establish baseline information on coastal habitat features such as: <ul style="list-style-type: none"> ▪ shoreline form, substrate, and vegetation type; ▪ biological resources, presence of sensitive species; ▪ life stages; ▪ sensitive human use resources; and ▪ the potential oil residency in different shoreline/substrate types. 	DFO, PCA	DFO: Community based coastal research and monitoring projects (Kinngait and Igloolik), coastal biodiversity studies (Milne Inlet, Frobisher Bay and other communities), and Arctic salmon program (Baffin Bay communities). PCA: See Recommendations 19 and 20.

36	5.1 Physical Environment	Gaps and Uncertainty	<p>Establish baseline information for water and sediment quality in the Area of Focus to include:</p> <ul style="list-style-type: none"> ▪ water sampling conducted during both open water and ice covered conditions; ▪ water sampling from multiple depths chosen to reflect variances in temperature and salinity; and ▪ comparison of local and regional water and sediment quality data to all applicable guidelines for the protection of marine life water and sediment quality sampling (e.g., Canadian Council of Ministers of the Environment guidelines). 	PCA	PCA: See Recommendations 19 and 20.
37	5.2 Biological Environment	Gaps and Uncertainty; Marine Planning	Baseline data should be used to identify sensitive (or critical) habitat for Species at Risk for incorporation into marine planning for the Area of Focus.	DFO, PCA	<p>DFO: Baseline data to identify sensitive (or critical habitat) for SAR and will be incorporated into marine planning.</p> <p>PCA: See Recommendations 19 and 20.</p>

38	5.3 Human Environment 9.0 Other Matters Considered by the Board	Gaps and Uncertainty	In collaboration with communities and responsible parties, update statistical data for key socio-economic indicators in the Area of Focus, including business investment data and contributions of economic sectors at the community level.	DFO	DFO: Could update harvest data and values at community level
39	5.3 Human Environment	Lack of Readiness Gaps and Uncertainty	Prepare an inventory of the existing communication and transportation infrastructure in the Area of Focus. Assess the adequacy of the current inventory and determine requirements for additional capacity that would be necessary to serve the development of the offshore oil and gas industry.		
40	7.3 Human Environment	Gaps and Uncertainty	Conduct a comparative analysis of oil and gas developments and alternative forms of economic development in the Area of Focus (e.g., commercial fishing, shipping, mining, and tourism) to include: <ul style="list-style-type: none"> ▪ a labour market analysis 	DFO, WWF	DFO: Supporting advancement of marine planning in Pikialasorsuaq/Sarvarjuaq (QIA led). Geospatial information on ecological features and socio-economic activities being collected. WWF: Will produce a report on economic alternatives to oil and gas development in the Canadian Arctic.

			<ul style="list-style-type: none"> ▪ cost-benefit-analysis; ▪ identification of education and training opportunities and ability to gain transferable skills; ▪ identification of types and numbers of local employment opportunities and other benefits; and ▪ discussion of potential limitations on the ability of Inuit communities to effectively participate in job, training, or other economic opportunities associated with a given type of economic development. 		
Recommendations to address should the current moratorium be lifted					
41	5.1 Physical Environment 7.1 Effects to Physical Environment	Gaps and Uncertainty & Marine Planning	Conduct baseline research to: <ul style="list-style-type: none"> ▪ establish baseline atmospheric and underwater sound levels in Baffin Bay and Davis Strait; ▪ improve understanding of the potential effects 	DFO, PCA, WWF	DFO: Research on impacts of ship traffic on narwhal movements and behavior in

			<p>of underwater noise and seismic activities on plankton, benthic organisms and invertebrates (including shellfish and arthropods), fish, waterbirds, and marine mammals; and</p> <ul style="list-style-type: none"> ▪ apply research to develop threshold criteria for assessing injury and behavioural disturbance. 		<p>Tremblay Sound (see recommendation 33).</p> <p>PCA: See Recommendations 19 and 20.</p> <p>WWF: Co-sponsoring a project at PAME working group to develop shipping acoustic underwater noise maps for Canada and the entire pan-Arctic (measures to reduce noise impacts will be contemplated).</p>
42	5.1 Physical Environment	Gaps and Uncertainty	<p>Conduct research, in consultation with industry leaders in petroleum exploration and production and other Arctic regions with oil and gas developments, to improve understanding of geohazards in the Area of Focus (e.g., glacial feature distribution, ice scour analyses, and seabed and underwater slope stability assessments) and geotechnical properties of marine sediment relevant to exploratory drilling and placement of structures on the seabed.</p>	NRCan (GSC)	<p>GSC: Synthesis of Arctic Petroleum Basins. Refining estimates of submarine landslides and tsunamis occurrence linked to past earthquakes.</p>

43	7.2 Effects to Biological Environment	Gaps and Uncertainty	<p>Conduct research to identify potential risks (including implications for the health and safety of individuals or populations) resulting from attraction to offshore structures and associated vessels for:</p> <ul style="list-style-type: none"> ▪ marine fish; ▪ waterbirds; and ▪ marine mammals. 		
44	7.2 Effects to Biological Environment	Gaps and Uncertainty	<p>Undertake research to:</p> <ul style="list-style-type: none"> ▪ identify current methods used to monitor for the presence of marine fish, waterbirds, and marine mammals in proximity to offshore oil and gas development infrastructure, and ▪ assess the effectiveness of these measures to avoid or reduce adverse interactions or other impacts. 		
45	7.5 Cumulative effects	Gaps and Uncertainty	Conduct research regarding the potential for cumulative effects on marine fish, waterbirds, and marine	DFO, PCA, TC	DFO: Science program to be implemented under OPP to collect baseline data in Frobisher

			<p>mammals with consideration of:</p> <ul style="list-style-type: none"> ▪ associated oil and gas activities combined with existing and potential future activities, including mining, marine transportation, commercial fishing, Inuit harvesting and traditional land use, and practices; ▪ direct project interactions; ▪ changes to water quality; ▪ habitat alteration or loss including disturbance of ice habitat; ▪ underwater noise; ▪ oil spills, including chronic leaks from platforms; and ▪ the release of sewage and grey water. 		<p>Bay. Management measures being examined.</p> <p>PCA: See Recommendations 19 and 20.</p> <p>TC: Cumulative Effects of Marine Shipping Initiative could contribute to a better understanding of the impacts of shipping to assist in future cumulative effects assessments. TC could support organization(s) leading this recommendation.</p>
Recommendations to address through future assessments					
46.	7.1 Effects to Physical Environment	Gaps and Uncertainty	Conduct research to:	WWF	WWF: Analyses of upstream and downstream climate impacts indicated it is highly unlikely

			<ul style="list-style-type: none"> ▪ assess upstream and downstream greenhouse gas emissions at various scales of offshore oil and gas development in Baffin Bay and Davis Strait; and ▪ determine if, and to what extent, oil and gas resources can be developed in the Area of Focus within the limits imposed under national and international carbon reduction targets. 		Arctic oil development would be consistent with global emissions targets under the Paris Agreement.
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TABLE 4: SUMMARY OF BOARD RECOMMENDATIONS ADDRESSING ASSESSMENT OF ECOSYSTEMIC AND SOCIO-ECONOMIC IMPACTS

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
47	7.2 Effects to Biological Environment	Gaps and Uncertainty	<p>Conduct research on the potential for effects on plankton of:</p> <ul style="list-style-type: none"> ▪ nutrient pollution from routine and produced water discharge from oil and gas activities; 	PCA	PCA: See Recommendations 19 and 20.

			<ul style="list-style-type: none"> ▪ ballast water discharge from shipping activities; and ▪ the potential introduction of non-native plankton species to the region. 		
48	7.2 Effects to Biological Environment	Gaps and Uncertainty	Conduct research on the relationship between changes in bloom phenology, abundance, productivity, and species composition of benthic flora and changes in the marine environment (e.g., sea ice distribution, ocean circulation, surface conditions, and temperatures) to better understand the potential non-linear feedback loops between climate change and the benthic marine environment.	DFO, PCA	<p>DFO: Additional resources required to address this recommendation. Ongoing project in Davis/Hudson Strait of fish that prey on shrimp to gain long-term insight into ecosystem variability, including impacts of climate change.</p> <p>PCA: See Recommendations 19 and 20.</p>
Recommendations to address prior to lifting the current moratorium					
49.	7.2 Effects to Biological Environment	Gaps and Uncertainty	Conduct research on the effects on benthic filtering organisms resulting from the uptake of suspended solids due to increased turbidity from development activities on/near the seabed.	DFO	DFO: No updates at this time.

50.	5.2 Biological Environment	Gaps and Uncertainty	<p>Conduct further research to assess:</p> <ul style="list-style-type: none"> the resiliency of sensitive areas; and whether these areas would return to natural conditions following cessation of oil and gas development. 	DFO, PCA	<p>DFO: No updates at this time.</p> <p>PCA: See Recommendations 19 and 20.</p>
51.	6.6 Additional Factors	Marine planning	Incorporating all relevant updated baseline data (including Inuit Qaujimagatuqangit and Inuit Qaujimaningit) and in collaboration with the Nunavut government, Inuit organizations, and local communities, initiate marine-based regional planning throughout the Area of Focus, including the development of regional priorities	DFO, WWF	<p>DFO: Currently working to complete a feasibility study for Tuvaijuiituaq MPA which includes compiling baseline data, knowledge sources and Inuit Qaujimagatuqangit to inform future management decisions. This will be done for future phases of the Sarvarjuaq initiative.</p> <p>WWF: Will be releasing CanPAC: Canadian Arctic Marine Priority Areas for Conservation report identifying a network of priority areas for conservation to best protect the species and habitats in this climate-threatened ecosystem.</p>
52.	6.6 Additional Factors	Alternatives	Reflecting updated baseline information and regional priorities identified in #51,	WWF	WWF: Will issue a report on economic alternatives to oil and gas development in the Canadian Arctic, likely in 2021

			<p>conduct an analysis of the risks and benefits of:</p> <ul style="list-style-type: none"> ▪ alternative economic development options (e.g., commercial fishing, renewable energy, and tourism) for the Area of Focus; and ▪ development of alternative energy sources which could support domestic energy consumption in Nunavut. 		
53.	7.2 Effects to Biological Environment	Gaps and Uncertainty	<p>Reflecting updated baseline research, assess the potential impacts of oil and gas development on components of the biological, physical, and human environments in the Area of Focus including:</p> <ul style="list-style-type: none"> ▪ sensitive areas; ▪ fish and fish habitat (including at different life stages); ▪ waterbirds; and ▪ marine mammals. <p>Assessment should address uncertainty regarding</p>	DFO	DFO: Assesses potential impacts of projects on fish and fish habitat, marine mammals and their habitat and provides expert advice to the NIRB during the environmental impact assessment processes.

			potential physiological and behavioural responses to impacts (such as acoustic and underwater noise) and should indicate how areas impacted by development are expected to change over time and under different climate change conditions/models.		
54.	8.9 Accidents and Malfunctions	Gaps and uncertainty	<p>Conduct baseline studies to understand potential effects of an oil or gas spill/release on:</p> <ul style="list-style-type: none"> ▪ the Arctic environment and wildlife (including migratory species of marine fish, waterbirds and marine mammals); ▪ the Inuit way of life, and northern economy, including tourism and fisheries, and food security; and ▪ preparedness for handling any spills that could occur. <p>Studies should consider potential effects of oil or gas spill/release under-ice and</p>	DFO, TC	<p>DFO: See recommendation 29. Ongoing (e.g. OPP initiatives); will be developing a relocatable drift prediction model (2020).</p> <p>TC: See Recommendation 31.</p>

			during the open water season.		
Recommendations to address should the current moratorium be lifted					
55.	4.2 Spill Response Regime	Lack of Readiness	<p>Establish a long-term, comprehensive Arctic spill prevention, response, and evaluation research program to:</p> <ul style="list-style-type: none"> ▪ predict and evaluate the effects of spills on the Arctic biological, physical, and human environments; and ▪ identify and evaluate effective spill prevention and response methods, equipment, and technology in the Arctic environment. 		
56.	7.2 Effects to Biological Environment	Marine Planning	Conduct research to improve understanding of the potential for oil and gas development to have impacts on sensitive areas in the Area of Focus, including for polynyas and areas with ice cover. This research should address how these areas may change over time, based on which types of oil and gas development	DFO, PCA	DFO: Ongoing work (e.g. Pikialasorsuaq, protected areas, conservation targets) includes processes to collect and synthesize existing knowledge in areas of potential interest for marine conservation. Science of the Pikialasorsuaq (completed 2020) to inform future discussions on management decisions for the region, including binational waters with Greenland.

			activities occur, and which climate change conditions/models are used.		Planning for 2021-2022 ship-based mission to the area with University of Manitoba. PCA: See Recommendations 19 and 20.
57.	7.3 Human Environment 8.9 Accidents and Malfunctions	Gaps and Uncertainty	Building on updated baseline information about commercial harvesting collected under Recommendation #27, identify the potential for oil and gas development (including resulting from associated spills or other incidents) to have adverse economic effects on Nunavut's existing and future commercial fisheries.	DFO, PCA	DFO: Collects baseline information (see recommendation 27) and can provide this fisheries information as requested. PCA: See Recommendations 19 and 20.
Recommendations to address through future assessments					
58.	7.2 Effects to Biological Environment	Gaps and Uncertainty	Project-specific assessments should include the assessment of potential impacts to plankton and benthic flora and fauna: <ul style="list-style-type: none"> posed by an oil spill or other possible shipping impacts; and due to chronic disturbance from increased shipping 		

			activity and underwater noise.		
59.	6.6 Additional Factors	Alternatives	<p>Strategic environmental assessments on offshore oil and gas activities in specific areas of known resources, such as the Saglek Basin and the Sverdrup Basin should be undertaken prior to project-specific assessment. Future SEAs should:</p> <ul style="list-style-type: none"> ▪ analyze different configurations and phases of potential oil and gas activities; and ▪ choose locations, environmental conditions, and study objectives in collaboration with the Nunavut government, Designated Inuit Organizations, and local communities. 		
60.	6.6 Additional Factors	Alternatives	Any future SEAs or project-specific assessments should include consideration of alternative technologies, particularly for marine seismic surveys.	WWF	WWF: Research suggesting marine vibroseis as viable alternative to seismic testing.

Table 5: Summary of Board Recommendations In Relation to Impact Mitigation

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
61.	7.1 Effects to Physical Environment	Gaps and Uncertainty; Marine Planning	<p>Reflecting updated baseline and effects assessment data, and the experience of the National Energy Board, Canada-Newfoundland and Labrador Offshore Petroleum Board, Canada-Nova Scotia Offshore Petroleum Board, and other relevant parties, and in collaboration with the Government of Nunavut, Inuit Organizations, and local communities and informed by Inuit Qaujimajatuqangit and Inuit Qaujimaningit conduct research to:</p> <ul style="list-style-type: none"> ▪ identify standard impact mitigation measures associated with offshore oil and gas development; and ▪ assess the effectiveness (or limitations) of these standard impact mitigation measures in the Arctic environment; 	WWF	WWF: Input into the Frontier and Offshore Regulatory Renewal Initiative, including recommended regulatory reforms.

			and develop standard mitigation measures for potential impacts associated with oil and gas developments in the Area of Focus.		
62.	7.2 Effects to Biological Environment	Gaps and Uncertainty	<p>Reflecting updated baseline and effects assessment data, conduct research to analyze the effectiveness of mitigation measures (including new technologies) designed to reduce potential acoustic impacts associated with oil and gas development and project-related shipping on:</p> <ul style="list-style-type: none"> ▪ fish; ▪ waterbirds; and ▪ marine mammals. <p>Research should include delineation between different species and their various life stages.</p>	DFO	DFO: No updates at this time.
Recommendations to address prior to lifting the current moratorium					
63	8.9 Accidents and Malfunctions	Lack of Readiness	In the development of emergency response plans, spill contingency and prevention plans, standard operating procedures, etc.	DFO, CER	<p>DFO: See recommendations 29 and 32.</p> <p>CER: In alignment with recommendation; oil and gas</p>

			and in the design of impact mitigation measures, oil and gas developers should incorporate lessons learned from accidents and malfunctions in similar jurisdictions, including associated standard operating procedures and impact mitigation measures.		explorers and developers expected to use all available information on accidents and malfunctions and must implement robust management systems.
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Table 6: Summary of Board Recommendations Regarding Monitoring

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
64.	7.3 Human Environment 9.0 Other Matters Considered by the Board	Marine Planning Inuit Qaujimaqatungit	Establish a mechanism for harvesters and community members to report: <ul style="list-style-type: none"> any observed issues with the quality of country food; and any other observed changes or concerns regarding impacts associated with development activities in the Area of Focus. 	DFO, PCA	DFO: No updates at this time. PCA: Aulattiqatigiit Board to address development of recommendations respecting continuity of Inuit cultural uses, protection of sites of special and spiritual-cultural significance to Inuit, and renewable resource harvesting including wildlife harvesting.
Recommendations to address prior to lifting the current moratorium					
65.	5.1 Physical Environment	Gaps and Uncertainty	Develop an improved surface weather monitoring network for the Area of Focus designed to increase		

			the accuracy of weather forecasting throughout the region, including mechanisms for taking into account rapidly changing climate conditions.		
Recommendations to address should the current moratorium be lifted					
66.	7.3 Human Environment 9.0 Other Matters Considered by the Board	Marine Planning Inuit Qaujimagatuqangit	Develop and implement programs to involve Inuit and nearby communities in local monitoring programs in Baffin Bay/Davis Strait (particularly including monitoring of priority harvesting areas).	DFO, PCA, CCG	DFO: Discussions around monitoring programs, community-based monitoring activities and research underway for Sarvarjuaq initiative. Support for community capacity development to lead initiative. PCA: See Recommendations 19 and 20. CCG: Supports NTI's Inuit Marine Monitoring Program, which could be adapted to monitor oil and gas developments if moratorium lifted.
67.	7.3 Human Environment	Inuit Qaujimagatuqangit	With the involvement of the Qikiqtani Inuit Association and communities, use food security research conducted under Recommendation #26 to inform project-specific impact assessments and monitoring programs	PCA	PCA: See Recommendations 19 and 20.

Table 7: Summary of Board Recommendations Addressing Impact Modelling, Mapping and Predictions

No.	Report Sections	Key Themes	Board Recommendation	Parties Tracking	Overview of Parties' Response
Recommendations to address irrespective of the current moratorium					
68.	5.1 Physical Environment	Marine Planning	Based on updated baseline information generated in Recommendation #30, model the temporal and spatial occurrence of sea ice in the Area of Focus.	PCA	PCA: See Recommendations 19 and 20.
69.	5.2 Biological Environment	Gaps and Uncertainty	Reflecting up to date information, including additional baseline gathered under Recommendations #27 and #50, produce up-to-date online maps of sensitive habitats for the Area of Focus with layers of information for relevant species and factors considered to identify sensitive habitats.	DFO, WWF, PCA,	DFO: No updates. PCA: See Recommendations 19 and 20. WWF: Its future CanPAC report (see Recommendation 51) will include maps that could be used for this purpose to some extent.
Recommendations to address prior to lifting the current moratorium					
70.	5.1 Physical Environment	Gaps and Uncertainty	Based on additional baseline research on coastal habitat features conducted in accordance with Recommendation #35, develop a coastal/shoreline sensitivity atlas.		
71.	5.2 Biological Environment	Marine Planning	Identify sensitive/critical habitat for Species at Risk	DFO, WWF	DFO: Ongoing work and discussions on protected area.

			where oil and gas activities should be limited, restricted, or prevented from occurring and/or where establishment of Marine Protected Areas may be appropriate.		<p>Refer to recommendation 56 for information on Northwater Canadian Science Advisory work and identification of SAR.</p> <p>WWF: Future CanPAC results/reports will include information on where establishment of Marine Protected Areas may be appropriate – including but not specifically focused on SAR.</p>
72.	7.2 Effects to Biological Environment	Gaps and Uncertainty	<p>Reflecting updated baseline data, conduct modelling of the different habitats within Baffin Bay and Davis Strait to improve confidence in the assessment of potential effects from oil and gas activities on the habitat supporting:</p> <ul style="list-style-type: none"> ▪ benthic flora and fauna; and ▪ plankton. <p>Modelling should include consideration of strong currents in the area and the potential for currents to intensify and extend the footprint of the potential impacts of deleterious</p>		

			substances released into the environment.		
73.	7.7 Effects of the Environment	Lack of Readiness	Investments should be made to improve ice monitoring and management services in the region to increase the accuracy of predictions in relation to sea ice extent, iceberg locations and trajectories, and the potential for extreme weather events.		
Recommendations to address should the current moratorium be lifted					
74.	5.1 Physical Environment	Gaps and Uncertainty	Shipping emissions associated with proposed oil and gas development should be modelled to understand the potential direct, indirect, and cumulative effects on air quality and contributions of greenhouse gas emissions	WWF	WWF: Conducts research on greenhouse gas emissions from shipping, which indicates that the industry is an important contributor to Canadian and global emissions. No data on shipping emissions associated with oil and gas development specifically.
75.	5.1 Physical Environment	Gaps and Uncertainty & Marine Planning	Based on baseline research conducted under Recommendation #41 to establish baseline atmospheric and underwater sound levels in Baffin Bay and Davis Strait, complete updated modeling of the dispersion of sound from anthropogenic sources and the potential direct, and cumulative effects, of noise	DFO	DFO: Suggests this may be completed when enough baseline data available.

			from oil and gas development activities on wildlife receptors (including marine fish, waterbirds and marine mammals).		
76.	7.3 Biological Environment	Marine Planning	Establish setbacks or other potential development restrictions on the proximity of oil and gas development activities, infrastructure, and other components to the floe edge.	DFO, CER	DFO: No updates at this time. CER: Expects companies to describe how setbacks and development restrictions are considered in their application to conduct oil and gas activities.
77.	7.3 Human Environment	Marine Planning	Establish setbacks or other potential development restrictions on the proximity of oil and gas development activities, infrastructure, and other components (particularly seismic surveying activities) in areas, and during seasons, where commercial harvesting takes place currently, or in areas where expansion of commercial harvesting is expected to take place in the future.	DFO, CER	DFO: No updates at this time CER: See Recommendation 76.
78.	7.3 Human Environment	Marine Planning	Consider establishing setbacks or other development restrictions on the proximity of oil and gas development activities, infrastructure and other	DFO, CER	DFO: No updates at this time CER: See Recommendation 76.

			components (particularly seismic surveying activities) in areas, and during seasons, that are currently closed to fishing in order to protect sensitive benthic areas and Narwhal overwintering habitats.		
79.	8.9 Accidents and Malfunctions	Marine Planning, Inuit Qaujimagatuqangit	In consultation with community members and Inuit knowledge holders, oil and gas developers should identify sensitive or important shorelines that could be impacted by spills, accidents, or other malfunctions associated with proposed oil and gas developments and project-shipping. When areas have been identified, oil and gas developers should ensure that spill plans incorporate this information and address community concerns, including items such as shipping restrictions during critical life cycle processes for marine wildlife (such as marine fish, waterbirds, and marine mammals).		