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Nunavut Impact Review Board
29 Mitik Street
P.O. Box 1360
Cambridge Bay, Nunavut X0B 0C0

Via email to: info@nirb.ca

Re: Strategic Environmental Assessment in Baffin Bay and Davis Strait

As requested, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) is providing an overview of some of the work being undertaken related to the Strategic Environmental Assessment in Baffin Bay and Davis Strait.

CIRNAC thanks the Nunavut Impact Review Board again for leading a successful process and preparing an excellent report for the Strategic Environmental Assessment. It represents a key contribution to informing the 5-year review of the moratorium on oil and gas activities in Canada's Arctic offshore waters.

Sincerely,

Mark Hopkins
Director General
Natural Resources and Environment Branch
Crown-Indigenous Relations and Northern Affairs Canada

Re: Strategic Environmental Assessment in Baffin Bay and Davis Strait

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) is involved in various projects related to the Strategic Environmental Assessment in Baffin Bay and Davis Strait. An overview of some of this work is presented below.

CIRNAC funding of the Qikiqtani Inuit Association's work on Inuit Qaujimajatuqangit

As part of the Strategic Environmental Assessment, CIRNAC requested the Qikiqtani Inuit Association to conduct a study of Inuit Qaujimajatuqangit for the region. The creation of an Inuit Qaujimajatuqangit Advisory Committee was critical throughout the process and, in discussions with the Qikiqtani Inuit Association, the importance of continuing this committee's work was understood. From 2019 to 2021, and with the support of the Inuit Qaujimajatuqangit Advisory Committee, the Qikiqtani Inuit Association is developing a five-year work plan, which will be available to CIRNAC and other funding agencies and research organizations, to help fill the many gaps in biological, physical and human research related to the marine environment critical to Qikiqtani Inuit. The work includes the development of:

- A comprehensive methodology for the implementation of the Inuit Qaujimajatuqangit Advisory Committee and its use in data collection, analysis and decision-making;
- Interpretations for the Qikiqtani Inuit Association's Inuit Qaujimajatuqangit policies related to the appropriate collection, analysis, and use of Inuit Qaujimajatuqangit in multiple settings;
- A five-year work plan related to resource management, focused on both Inuit Qaujimajatuqangit and western scientific priorities.

CIRNAC-funded research

- Government of Nunavut: Using satellite images acquired from 2017 to 2019 with Canada's RADARSAT-2 satellite for reconnaissance mapping of suspected and known oil seeps; and analyzing and interpreting these satellite images, while building on previous studies conducted on oil slick imagery for longer-term monitoring purposes, to further understand the geographical extent of the phenomenon and provide insight into the petroleum systems involved.

- Geological Survey of Canada: Assessing the activity of natural oil seeps through the analysis of multibeam bathymetry and sediment samples; and establishing the recurrence of earthquakes in the Baffin region through the dating of submarine landslides from collected sediment cores.

- Geological Survey of Canada: Refining estimates of the recurrence of submarine landslides and tsunamis linked to past earthquakes in eastern Baffin Island. Specifically, mapping the distribution of submarine landslides using all available datasets; assessing the stability of slopes near Pond Inlet, Qikiqtarjuaq and Pangnirtung and the recurrence of landslides and earthquakes offshore these communities based on the analysis of legacy and newly-collected sediment cores; monitoring active geohazards in selected key sites through repeat multibeam

bathymetric surveys and the deployment of current profiler moorings; and collecting sediment cores to establish the first physical record of tsunami deposits in the region.

- Fisheries and Oceans Canada: Tracking of whales migrating along the Baffin Bay-Davis Strait-Labrador Sea corridor, using telemetry study, to better understand the potential threats of distribution shifts of subarctic whale species to endemic Arctic whales.

- Fisheries and Oceans Canada: Documenting migration pathways and northern range extent of subarctic whales using satellite telemetry; assessing ecosystem impacts relative to food and space competition with endemic Arctic whales using population and bioenergetics models; evaluating killer whale predation on endemic Arctic whales relative to the presence of subarctic baleen whales as additional prey; understanding whale stock structure, life history, and abundance using hormone microchemistry analysis of recent biopsy samples and archived ear plugs collected from Canada's commercial whaling era; and measuring past abundance of large whales using genomic effective population size estimated from archived tissue and collected biopsy samples.

- Environment and Climate Change Canada: Producing predictive density surface models for key seabird species to identify seasonal marine areas of high seabird abundance and diversity in Baffin Bay and Davis Strait, and to place any potential effects of future offshore oil and gas activities in context by evaluating other anthropogenic risk to Arctic seabirds.

- Fisheries and Oceans Canada: Identifying narwhal home range areas in Baffin Bay and isolating those areas where narwhals feed in relation to ice cover; determining if home range and feeding areas in Baffin Bay have changed over time (2010-2017); estimating the proportion of potential prey species consumed in those areas; refining a bioenergetics model for narwhals to estimate the energy needed for survival, growth, and reproduction; and estimating the biomass of prey needed to fulfill these energy requirements.

- Fisheries and Oceans Canada: Evaluating cortisol concentrations in narwhals over time to determine if concentrations are correlated with increased vessel traffic in Eclipse Sound, a key narwhal summering area; and determining if changes in stress levels are correlated with changes in demographic parameters such as reproductive rates, which would have impacts at the population level.

- Environment and Climate Change Canada: Analyzing archived and contemporary samples of marine species to determine the baseline levels of oil-related contaminant exposure over the last ten years in the Baffin Bay and Davis Strait region; and assessing the effects of the oil-related contaminant exposure in marine species in the region via state-of-the-art biochemical and cellular approaches.

- Environment and Climate Change Canada: Completing full validation and interpretation of all data in the above project and applying highly specialized statistics in order to: compare the polycyclic aromatic compounds in five species examined in relation to trophic level using stable

isotopes as indicators of trophic position; analyze oil-related contaminants in two seabirds species over a ten-year time period; examine polycyclic aromatic compounds and trace elements in relation to metabolic functions measured through the metabolomics assessments in four marine species; and examine the relationships between the concentrations of polycyclic aromatic compounds and trace elements and gene expression in two bird species.

- Fisheries and Oceans Canada: Quantifying the fine scale movement of narwhals in their summering ground in relation to their prey availability, to predator and environment (current, temperature, salinity, bathymetry); quantifying the migration and winter habitat selection of narwhals; and investigating the connectivity between narwhals of the Eclipse Sound and Admiralty Inlet summer stocks.

- Fisheries and Oceans Canada: Providing baseline information regarding the spatio-temporal distribution of marine mammals; documenting noise from anthropogenic sources in recordings; and measuring sound pressure levels at hydrophones to determine baseline ambient noise levels in Baffin Bay and assess the contribution of biological, anthropogenic, and environmental sources.

- Fisheries an Oceans Canada: Addressing uncertainties in movements and distributions of walrus and narwhals that inhabit Baffin Bay and Davis Strait, using trace element profiles in tusks to reconstruct long-term individual movements within and among areas with different baseline values, to inform the degree of mixing, if any, between regions, and allow for updating of stock delineations where appropriate; and building science capacity in the North through training of research and community-based monitoring personnel.

- Fisheries and Oceans Canada: Assessing community engagement in monitoring the harvest of "unusual fish" using a community-based monitoring program; expanding a community-based monitoring program to eastern Arctic communities to assess changes in the known spatio-temporal distribution and abundance of Atlantic salmon, Pacific salmon species, and other "unusual fishes" including native Arctic fishes outside known distributions; summarizing the published harvest records of Atlantic salmon from communities in the eastern Canadian Arctic; and transferring knowledge and technical understanding to local communities encountering "unusual fish" species to underpin co-management decisions by Hunters and Trappers Organizations.

<u>Activities part of the science-based assessment to inform the 5-year review of the moratorium</u>

Strategic Environmental Assessments will be key information sources for the 5-year review of the moratorium on oil and gas activities in Canada’s Arctic offshore waters. The two reviews, one for the Eastern Arctic and one for the Western Arctic, are being undertaken in collaboration with federal, territorial and land-claim organizations. The geographical scope of these initiatives cover Canada’s Arctic offshore waters and include the Baffin Bay and Davis Strait region.

1) Geological Survey of Canada - Synthesis of Arctic Petroleum Basins (completed): A geological synthesis of Arctic petroleum basins, including evaluating previously completed and published assessments and reports to determine methodology, areal limits, assumptions and data coverage; compiling information on regional geology, petroleum systems and data coverage in areas not covered by previous resource studies; converting all previous work to standard geographic reference framework, nomenclature, and reporting of resource type; evaluating resource potential based on existing studies where available, and analogue/probabilistic methods for areas with less data availability; and preparing a report of predicted resource potential.

2) An 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 in 2020).

3) Technical matters such as oil spill prevention and response (to be launched in 2020).