Natural Resources Canada | Ressources naturelles Canada

July 22, 2022

Debra Myles
Senior Advisor / Strategic and Regional Assessment
Manager / Regional Assessment in the Ring of Fire Area
Impact Assessment Agency of Canada
debra.myles@canada.ca

Subject: Input on Request for a Regional Assessment in the Salish Sea

Thank you for meeting with Natural Resources Canada (NRCan) on Tuesday, July 5, 2022. In this letter we are responding to the questions about the need/rationale for a Regional Assessment (RA) in the Salish Sea from the presentation the Impact Assessment Agency of Canada (IAAC) provided at that meeting.

NRCan is committed to improving the quality of life of Canadians by ensuring the country's abundant natural resources are developed sustainably, competitively, and inclusively. Through its broad mandate, relevant expertise at NRCan includes supporting information and knowledge related to coastal erosion, coastal flooding, oil spill behaviour, seismic hazards, and sediment transport modelling.

Attached is an annex with NRCan's detailed response to questions from the "Regional Assessment Request: Salish Sea, Federal Authority Briefing". In general, this annex provides additional information that could inform your recommendation to the Minister on whether to conduct a regional assessment in the Salish Sea.

If you have any questions, please do not hesitate to contact me at Peter.Unger@nrcan-rncan.gc.ca.

Sincerely,

<original signed by>

Peter Unger
A/Director, Impact Assessment Division
Office of the Chief Scientist

Enclosure:
Annex 1 – NRCan's Input on Request for a Regional Assessment in the Salish Sea
Annex 2 – References

Annex 1 – NRCan's Input on Request for a Regional Assessment in the Salish Sea

Questions taken from and numbered according to Slide 8 – Focus of FA Advice/Involvement from the "Regional Assessment Request: Salish Sea, Federal Authority Briefing" deck.

2. Whether current and future development in the region has the potential to cause adverse effects, including cumulative effects, that fall within federal jurisdiction.

We offer the following considerations regarding the potential to cause adverse effects, including cumulative effects, that fall within federal jurisdiction.

The population surrounding the Salish Sea is growing, currently at almost 9 million (Sobocinski, 2021). As the proponent states, this population depends on the Salish Sea ecosystem. As such, understanding effects, including cumulative effects, of development is critical.

NRCan supports the proponent's emphasis on building data baselines for gauging impacts. Researchers across NRCan have collected a significant amount of baseline information in the Salish Sea, including data pertaining to the shape (geomorphology) of the seabed, geology of the seabed, sea-level change, as well as past and modern geological processes. This baseline information is vital for supporting evidence-based decisions and should form part of the proponent's data gathering exercise if the RA was to proceed.

Assessment of future adverse effects on biota and environmental quality better align with research efforts of Fisheries and Oceans Canada (DFO) and Environment and Climate Change Canada (ECCC). However, it is reasonable to assume that future development in the region may alter sediment transport, which has direct consequences for benthic habitat, seabed stability, and coastal evolution.

3. Whether there are environmentally, or otherwise sensitive areas or components located in the region that might be affected by development.

Since the Salish Sea is a geologically dynamic area, NRCan suggests that numerous marine geological components should be considered in decision-making. These aspects may be affected by development, and, importantly, may affect development. They include:

a) Areas of active sediment transport, including the Fraser Delta (e.g. Hill and Lintern, 2021)
b) Seabed and sub-seabed locations of faults, some potentially active (e.g. Greene and Barrie, 2020)
c) Seabed geological expression of bioherms including those composed of Glass Sponge Reefs (Dunham et al, 2018) and Lophelia Coral (Conway et al., 2007)
d) Locations of known cold seeps adjacent to the Salish Sea (Riedel et al., 2018) and potential locations in the Salish Sea
e) Submarine landslides and slope stability
f) Tsunami hazard
g) Groundwater flow
h) Seabed oceanographic conditions at disposal sites at sea
i) Flood hazard risks from storm surge

j) Other geological hazards

The Geological Survey of Canada, housed at NRCan, has produced a wealth of knowledge products on the geology of the Salish Sea region. These products are available from NRCan's GEOSCAN database (https://geoscan.nrcan.gc.ca/) and on the Open Science and Data Platform (OSDP) (https://osdp-psdo.canada.ca/dp/).

Additionally, data from NRCan's marine and coastal geoscience work is publicly accessible and could be used to help make determinations about environmentally or otherwise sensitive regions in the Salish Sea. These resources are as follows:

a) The Expedition Database contains marine and coastal field surveys in Canada's Atlantic, Pacific, and Arctic waters. The database contains details about where geological samples and geophysical surveys were collected, links to expedition reports, and results from laboratory analyses.
https://www.nrcan.gc.ca/earth-sciences/earth-sciences-resources/geoscience-marine-and-coastal/10896
b) BASIN is a database that contains a wealth of geological, geophysical, and engineering information related to many years of petroleum exploration. Its data is centred around exploration wells and locational data from a large number of seismic surveys.
https://basin.marine-geo.canada.ca/
c) The Canadian National Marine Seismic Data Repository is a digitized inventory of analog marine survey field records spanning more than 50 years.
https://open.canada.ca/data/en/dataset/e1fa0090-4b06-e476-5c71-e2326666a4d0
d) A collection of Canadian offshore seafloor photographs, typically in sequences of 10 to 20 photos from a single station, taken using specialized underwater cameras.
https://open.canada.ca/data/en/dataset/44cbbdc0-d33d-abe7-b08a-f5872bc0a48a
e) A Web Map Service (WMS) provides maps of geospatial data. It provides access to different types of marine imagery including seismic, side scan, and multibeam data.
https://www.nrcan.gc.ca/web-map-services-for-marine-geoscience-data/17402

5. Whether there is the potential for impacts, including cumulative impacts, to the rights of Indigenous people in the region.

This request originates from an Indigenous not-for-profit organization concerned with cumulative effects, so it is reasonable that they are concerned with potential impacts to the rights of Indigenous people in the Salish Sea region. NRCan researchers conducting work in and pertaining to the Salish Sea engage and collaborate with several First Nation communities in the region on its research projects. A more in-depth investigation into information and details regarding engagement and collaboration in the region can be pursued upon request.

NRCan plays a supporting role in the Salish Sea Initiative. The Initiative supports Indigenous groups in conducting marine stewardship activities in the Salish Sea. NRCan provides scientific, technical, and administrative capacity funding for Indigenous groups to monitor the local marine environment and participate in broader planning processes. This initiative is one of eight accommodation measures developed in response to the approval of the Trans Mountain Expansion Project, and it responds to concerns related to the cumulative effects of increased

human activities on valued ecosystem components of the marine ecosystem. The Initiative is funded under DFO and more details can be found here: https://www.canada.ca/en/campaign/trans-mountain/what-is-tmx/the-decision/backgrounder11/salish-sea-initiative.html.

7. Whether an existing or planned initiative would adequately address the issues raised in the request.

The proponents name several initiatives in their letter and note their disparate nature and the need to unify these initiatives for the Salish Sea region. Missing from their list is Canada's Marine Spatial Planning initiative (https://www.dfo-mpo.gc.ca/oceans/management-gestion/msp-psm/index-eng.html) that aims to "consider the range of human activities planned for a given marine area over time (such as fishing, cultural uses, conservation areas, energy development, etc.) to keep our oceans healthy and productive for generations to come". Marine spatial planning is a practical, internationally recognized process that will enable the Government of Canada to plan and coordinate ocean activities in collaboration with provincial, territorial, and Indigenous governments. In Canada, this process is led by DFO with several other Federal departments contributing, including NRCan.

Given the high cost of collecting data in the marine environment, it is prudent to make the use of existing and ongoing data collection and synthesis initiatives. NRCan has conducted marine geoscience research in the Salish Sea region since the 1960's and has contributed to environmental assessments in the region (see Question 8). Many of NRCan's knowledge products are discoverable on GEOSCAN and on the Open Science Data Platform (see Question 3).

Of relevance to this specific request are research activities under the Marine Geoscience for Marine Spatial Planning (MGMSP) and Public Safety Geoscience (PSG) programs (https://www.nrcan.gc.ca/earth-sciences/earth-sciences-resources/geoscience-marine-and-coastal/10896). NRCan's Geological Survey of Canada (GSC) produces knowledge products at a variety of scales, including peer-reviewed maps of surficial geology, seabed sediment composition, seabed morphology, and seabed disturbance. These knowledge products provide fundamental information about baseline marine geological conditions and processes. For the Salish Sea, these products include:

a) A regional-scale digital elevation model https://open.canada.ca/data/en/dataset/e6e11b99-f0cc-44f7-f5eb-3b995fb1637e
b) A surficial geology map of the Salish Sea region currently in preparation (see Figure 1)
c) A targeted geological assessment of Burrard Inlet is underway
d) In collaboration with DFO, an investigation of the cumulative effects from commercial anchoring at British Columbia's coastal anchorages
e) A compilation of discrete seafloor sediment grainsize for the British Columbia coast

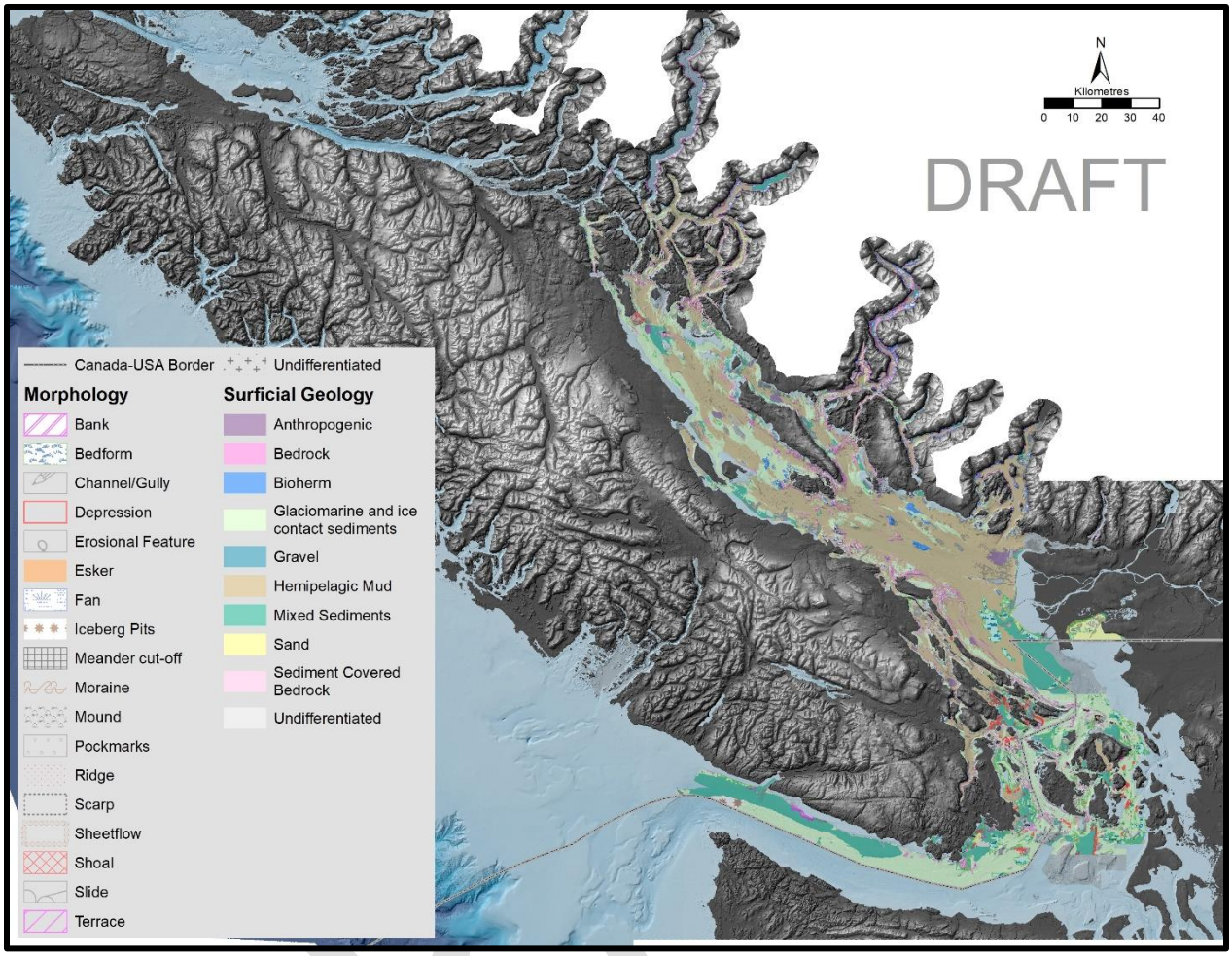

Figure 1- Draft marine geology and morphology map currently in development for the Salish Sea region (K. Douglas, pers. comm., July 12, 2022).

Indirectly, an RA in the Salish Sea area could inform analysis of mining economics related to federal Impact Assessments of ports in the region. Decisions related to ports can have significant implications for mining projects both within and beyond the regional study area. For instance, the Port of Vancouver handled 22 Mt of metallurgical coal exports, 15 Mt of thermal coal re-exports, and 9 Mt of potash exports in 2021. If the Roberts Bank Terminal 2 Project (currently being assessed under CEAA 2012) were not to advance, potential mining projects in the area may not have an economic way to move product to export markets. Alternatively, proponents may have to incur additional costs to ship through alternative routes, such as the Port of Prince Rupert on the north coast of British Columbia, which is also currently exploring expansion projects potentially subject to federal Impact Assessments. While federal interest in RAs generally focus on environmental effects and effects under federal jurisdiction, NRCan believes that the potential for significant economic effects would warrant attention in this RA if it is to advance, especially given that economic effects are so central to public interest determinations under the *Impact Assessment Act*. It is likely that assessments in the Salish Sea region will have significant implications and effects across industries. For instance, the Port of Vancouver, Canada's largest port by traffic volume, handled 146.5 million tonnes (Mt) of cargo in 2021, including exports of

coal, crude oil, wood products, potash, grain, containers, breakbulk cargo, and automotive products.

8. Information from proponents, provinces, territories or Indigenous groups that the Agency might have from other areas of its work, including from project impact assessments either underway or completed.

NRCan contributed or is presently contributing to the following assessments, with some conducted by IAAC and others through other authorities:

a) Roberts Bank Terminal 2 Environmental Assessment https://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/shorte.web&search1=R=299787
b) Tilbury Phase 2 LNG Expansion Project Impact Assessment by Substitution
c) National standards for geological and geophysical site characterization for marine renewable energy development and environmental assessment https://www.csagroup.org/store/product/EXP03-2015/
d) Trans Mountain Expansion Project (TMX)
e) Deltaport Third Berth project
f) Deltaport Expansion Berth 4 project (DP4)
g) Expansion of Centerm terminal (Burrard Inlet)
h) Dredge disposal site assessments, with ECCC
i) Coastal protection projects (ecosystem based management coastal protection and risk; e.g. Living Dyke Project in Boundary Bay)
j) BC Hydro marine crossings

For additional exploration into project-related data, NRCan maintains the Major Projects Inventory. The inventory details major natural resource projects and expansions that are currently under construction or for which construction is planned for the next 10 years. These data are broken down by industry, and so forecasted development can be analyzed for given industries that are present in the region. The Inventory can be found here: https://maps-cartes.services.geo.ca/server_serveur/rest/services/NRCan/major_projects_inventory_en/MapServer.

NRCan also possess or contributes to several datasets and platforms that could contribute useful information to this potential RA.

In addition to NRCan's own resources, we are aware of a few related resources from other sources. Firstly, the Health of the Salish Sea Report is an evergreen document that describes trends across 10 indicators used to identify areas of progress in environmental management and priorities for further action across the Salish Sea. The resource was created and is managed jointly between the United States Environmental Protection Agency (EPA) and Environment and Climate Change Canada (ECCC). The report can be found here: https://www.canada.ca/en/environment-climate-change/services/cumulative-effects/salish-sea-ecosystem/health-report.html

After conducting a preliminary scan of mining projects in the region, NRCan is aware of at least eight operating or advanced mining and mineral processing properties located in the area of the proposed RA. It is uncertain as to whether pre-production projects will advance and/or be subject to the federal Impact Assessment process, however, four advanced exploration projects are the most likely projects to reach the federal Impact Assessment process within the next 5-10 years. There are also a number of other early exploration projects located within the area, including for the critical minerals copper, nickel, molybdenum, and zinc. It is possible for existing projects to propose expansions that could be subject to assessment, and currently inactive projects can become active again relatively quickly in response to favourable market conditions.

Annex 2 – References

Conway, K.W., Barrie, J.V., Hill, P.R., Austin, W.C., Picard, K., 2007. Mapping sensitive benthic habitats in the Strait of Georgia, coastal British Columbia: deep-water sponge and coral reefs. Geol. Surv. Can. Curr. Res., 2007 (A2), pp. 1-6

Dunham, A., Archer, S.K., Davies, S.C. , Burke, L.A., Mossman, J., Pegg, J.R., Archer, E., 2018. Assessing condition and ecological role of deep-water biogenic habitats: Glass sponge reefs in the Salish Sea. Marine Environmental Research, 141, pp. 88-99, ISSN 0141-1136, https://doi.org/10.1016/j.marenvres.2018.08.002

Greene, H.G., and Barrie, J.V. 2020. Faulting within the San Juan–southern Gulf Islands Archipelagos, upper plate deformation of the Cascadia subduction complex. Geological Society, London, Special Publications, 505, 15 July 2020, https://doi.org/10.1144/SP505-2019-125

Hill, P.R. and Lintern, D.G., 2021. Sedimentary processes at the mouth of a tidally-influenced delta: New insights from submarine observatory measurements, Fraser Delta, Canada. Sedimentology, 68(6), pp.2649-2670

Riedel, M., Scherwath, M., Römer, M., Veloso, M., Heesemann, M., Spence, G.D., 2018. Distributed natural gas venting offshore along the Cascadia margin. Nat Commun **9,** 3264 (2018). https://doi.org/10.1038/s41467-018-05736-x

Sobocinski, Kathryn L., "State of the Salish Sea: Executive Summary" (2021). Institute Publications. 2. https://cedar.wwu.edu/salish_pubs/2