Lopez NO COALition Comment
on the proposed
Kinder Morgan Trans Mountain Pipeline Expansion Project

We represent residents of Lopez Island who are directly affected by the transportation of fossil- fuels in the Salish Sea and in particular the waters around the San Juan Islands. And we are very concerned about additional and cumulative adverse impacts from all the proposed and expanding fossil-fuel transportation facilities and their associated increase in large vessel traffic.

We ask that the NEB not approve the Kinger Morgan Trans Mountian Project as submitted due to the following issues: inadequacy of oil spill response capability, lack of clear transboundary responder immunity, insufficient knowledge about the fate and behaviour of diluted bitumen (dilbit) in the marine environment, health and safety issues for responders caused by volatile components of dilbit, and adverse impacts to the San Juan Islands National Monument, San Juan National Wildlife Refuge, property values, local economy, marine foodweb, residents and wildlife, including endangered Southern Resident Killer Whales and Chinook salmon.

The initial focus of Lopez NO COAlition concerned the impacts of the proposed Gateway Pacific Terminal on our waters and the marine ecosystem they nurture. In collaboration with like-minded organizations in the San Juan Islands — the Friends of the San Juans, Orcas NO COALition, and San Juan Islanders for Safe Shipping — we issued a white paper in 2012, "The Salish Sea Imperiled," (attached as Exhibit 1) which explored these impacts and was updated it in 2013.[1] It includes adverse impacts from oil spills, air and water pollution from fugitive coal dust, and underwater noise that would occur if that project were to be approved. In addition, many of us commented (individually

[1] The San Juans Alliance, "The Salish Sea Imperiled: A community response to increased coal transport around the San Juan Islands," Friday Harbor, WA, August 2013 (See Exhibit 1).

and severally) during the scoping process for the environmental impact assessment of that project.

Since then we have expanded our scope of concerns to include impacts from other proposed projects that would increase marine traffic through the waters of the San Juan Islands, in particular the transport of various forms of fossil fuels which we believe pose an extreme threat to our economy and the marine ecology of our islands. This is specifically true for large oil tankers transiting Haro and Rosario Straits, which have swift currents, adjacent rocks and shoals, significant other maritime traffic, and whose narrow channels present maneuvering challenges with scant tolerance for navigational or mechanical difficulties in such huge vessels. The proposed Kinder Morgan Trans Mountain Pipeline Expansion Project would increase the tar sands oil (also known as "oil sands") crude oil tanker traffic from its Westridge Terminal from less than one vessel per week to more than one per day, imposing a considerable added risk to our marine ecosystems' health and viability. The ecology and economy of the San Juan Islands depends upon a healthy marine environment, which will be placed at risk by this proposed project. Therefore, we are submitting our comments in an effort to ensure that any such adverse impacts are addressed and eliminated by the project proponents.

What's at Risk: the San Juan Islands Marine Ecosystem

The San Juan Islands surrounded and influenced by strong tidal currents from the Straits of Juan de Fuca and Georgia, as well as outflows from the Fraser River, sustain a marine ecosystem rich in nutrients.[2] Currents are a significant force surrounding all of our islands, but they are particularly strong in Haro Strait on our western boundary and almost as strong in Rosario Strait on the county's eastern boundary. Vessel traffic from marine terminals in British

[2] A good general description can be found in Audrey DeLella Benedict and Joseph K. Gaydos, *The Salish Sea: Jewel of the Pacific Northwest,* (Seattle: Sasquatch Books, 2015).

Columbia must transit Haro Strait and navigate past Turn Point which has been designated by the USCG as the most hazardous marine passage used by large commercial vessels on the west coast of the United States. These deep, fast-flowing waters are an important part of the critical habitat for our Southern Resident Killer Whales (or "Orcas") which are designated as an endangered species by both Canada and the United States. In summertime when these Orca inhabit the Salish Sea, Fraser River Chinook salmon are their primary food source and are hunted by Orca mainly off the west coast of San Juan Island in Haro Strait. Coincidentally, Chinook salmon, the Orcas' principal prey, are classified as a threatened species in the United States.

Dall's and harbor porpoises also frequent these waters, as do harbor seals, the occasional stellar sea lion and more rarely the Northern elephant seal. Migrating salmon and the local populations of forage fish, particularly herring, Pacific sand lance and surf smelt support these marine mammals. These fish are also a staple in the diet of the many seabirds such as cormorants, oystercatchers, seagulls and Marbled Murrelets that reside in the islands. In the spring and fall, migrating populations of buffleheads, pintails, Western grebes, mergansers, other species of ducks, and many other waterfowl pass through or take up temporary residence here.[3]

Meadows of eelgrass and kelp forests provide ecosystem structure along the shores of the San Juan Islands, providing shelter and nutrients for salmon smolts on their way to the Pacific Ocean.[4] In the near-shore waters anemones, barnacles, mussels, oysters, Dungeness and rock crabs, numerous species of invertebrates, and ochre sea stars, can be found. In the deeper waters, offshore,

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[3] Joseph K. Gaydos and Scott F. Pearson, "Birds and Mammals That Depend on the Salish Sea: A Compilation," *Northwest Naturalist* 92 (Autumn 2011), pp. 79–94.

[4] Benedict and Gaydos, *The Salish Sea*, esp. Chapter 5: Life at the Edges, pp. 51–63.

reside ling cod, several varieties of bottom-dwelling rockfish and, most importantly for salmon, sand lance.[5]

The land forms and shoreline on the south and southeast coast of Lopez Island are unusually stunning and have historic, ecological and scientific significance. To provide protection of these lands, President Obama in 2013 declared 400 acres of land along the southern Lopez shoreline that are considered "areas of critical environmental concern" as part of the San Juan Island National Monument. In total, the National Monument encompasses approximately 1,000 acres in San Juan County, all of which contain rocky or beach shorelines. The San Juans National Wildlife Refuge has another 83 islands, reefs and rocks totaling about 450 acres and Lopez Island has another nearly 30 acres of state and county parks, all of which have significant waterfront exposure. Additionally, the county also has nearly 60 small islands or rocks, which serve as haul-outs for marine mammals and nesting sites for seabirds.

This marine ecosystem is of crucial importance to the economy of San Juan County, which relies heavily on tourism. For example, in a county with 17,000 residents, this industry attracted over 700,000 visitors in 2012; collectively they contributed nearly $158 million to our economy and provided as many as 6450 jobs directly, indirectly and induced.[6] A sizeable oil spill coating the shores of these islands would decimate our economy, leading inevitably to an extensive loss of local jobs and the deterioration of our islands way of life. Considering spill response, cleanup, remediation and cumulative environmental and economic losses (including lost view and shoreline property values) costs and economic damages could fall in the billions of dollars.

In the following pages, we discuss two areas of major concern to Lopez Islanders about the proposed Kinder Morgan Trans Mountain Pipeline

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[5] H. Gary Greene, et al, "Deep-Water Pacific sand lance (*ammodytes hexapterus*) habitat evaluation and prediction in the Northwest Straits Region," Northwest Straits Commission, Mount Vernon, WA. http://www.nwstraits.org/media.1101/nws-2011-016_pugetsandlance-finalrept_cond.pdf

[6] "The Salish Sea Imperiled," p. 3.

Expansion Project. These concerns are related to the greatly increased tanker traffic through and near our waters that will result from project approval:

- increased likelihood of oil spills fouling our shores and tidelands and the challenges of spill response and recovery
- the unresolved fate and behavior of diluted bitumen spilled in marine waters

We are also concerned by the increasingly noisy underwater soundscape, especially as it adversely impacts the feeding, communication, social interactions, and rearing of Orca whales. This influence is well researched and presented in the Orcas NO COALition Comment Letter (A71326) to the NEB which we commend and endorse.

Increased Likelihood of Oil Spills

The addition of nearly 460 annual tanker transits to the 120 current tanker transits (total 580), required at full pipeline capacity, traveling through Boundary Pass, Haro or Rosario Straits will inevitably increase the likelihood of oil spills impacting San Juan Islands waters. This is especially true when added to the vessel traffic from recently added, permitted, under construction and potential additional other terminal projects which could contribute more than 700 additional vessel transits along the projects' proposed vessel traffic route. [7]

Major spills in San Juan waters can result from vessel collisions or from a tanker striking one of the shallow reefs or rocks along its route (for example, Arachne Reef or Cooper Reef near Turn Point in Haro Strait or Belle rock, Buckeye shoal, and Peapod Island in Rosario Strait). Such an allision befell the *Exxon Valdez* in 1989 leading to the release of at least 260,000 bbl of crude oil into Prince William Sound, Alaska. Although project tankers will be double hulled and accompanied by tugs, the probability of such a major oil spill in San Juan Islands waters cannot be completely eliminated. According to a George

[7] Lovel Pratt (A58455) Comment Letter Hearing Order OH-001-2014. PDF, pages 15-16.

Washington University (GWU) analysis of Salish Sea vessel traffic, adding tanker traffic from the Trans Mountain project (Case R) increases the risk of oil loss by 36% over the 2010 base case in Haro Strait and Boundary Pass and when the three major planned expansion and construction projects are included --GPT, KM, and Delta Port – (Case T) the risk increases by 68%.[8]

Comparisons can be made between the GWU study and data presented in the project proposal, which are based on global accident and oil-spill rates. For example, the likelihood of a 104,000 barrel "worst-case" spill in the Salish Sea due to the added tanker traffic increases from 1 in 3,093 years to 1 in 456 years; probability of a more likely 52,000 barrel spill grows from 1 in 619 years to 1 in 91 years.[9] These odds sound small, but they correspond to probabilities of 2.2 and 11 percent per decade. These are risk levels we consider unacceptable. Adding another caveat, the Trans Mountain proposal recognizes, DNV [Det Norske Veritas] which cautions that *the global incident data for oil tankers is not directly comparable to the Salish Sea region* because the global data does not take into consideration local weather conditions, sailing route navigability, and local risk controls which if implemented would reduce the likelihood for an incident.[10] With more than 16,000 large-vessel transits in 2013 adding as much as 4000 more new transits from all new and proposed Salish Sea terminals will only serve to make our two large vessel routes very crowded, and these data do not include ferries, fishing boats, or pleasure craft.[11]

Given our strong tidal currents, fog, and occasionally gale-force winds, conditions in the San Juan shipping channels are probably harsher than the global averages employed in the DNV study. Therefore, the GWU approach,

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[8] George Washington University/VCU, VTRA 2010, page 18.

[9] Trans Mountain Pipeline ULC, Trans Mountain Pipeline Expansion Project proposal, Volume 8-A – Marine Transportation, Tables 5.2.3 and 5.2.4 on p. 525.

[10] Ibid., p. 519 (emphasis added).

[11] San Juan Islanders for Safe Shipping Salish Sea Terminals, New and Proposed Annual Vessel Transits.

which is based on data for local vessel traffic, currents and weather conditions, is a more relevant assessment of oil-spill risks allocated to the proposed project. In fact, that study clearly demonstrates that the increased probability of oil spills would occur predominantly in Boundary Pass, Haro Strait and the Strait of Juan de Fuca.[12]

The project proposal includes detailed simulations on the extent and severity of oil spills that could occur at sample points along the tanker transit route to and from Westridge Terminal through the Salish Sea and the Strait of Juan de Fuca. Two of these points are notably relevant to the San Juan Islands: one in Georgia Strait off Point Roberts ("D"), where tankers would encounter BC Ferries from the Tsawwassen Ferry Terminal; and another ("E") at the edge of Arachne Reef near Turn Point at the northern end of Haro Strait.[13]

We focus on the first of these scenarios, as a more detailed analysis of the second scenario ("E") can be found in the comments submitted by the San Juan Islanders for Safe Shipping.[14]

[12] Van Dorp and Merrick, "Preventing Oils Spills," p. 103.

[13] Trans Mountain proposal (ref. 15), Vol. 8A, Table 5.2.2, p. 524; pp. 565–581; 596–597; 638–714.

[14] San Juan Islanders for Safe Shipping Comment Letter Hearing Order OH-001-2014 pp. 15–16.

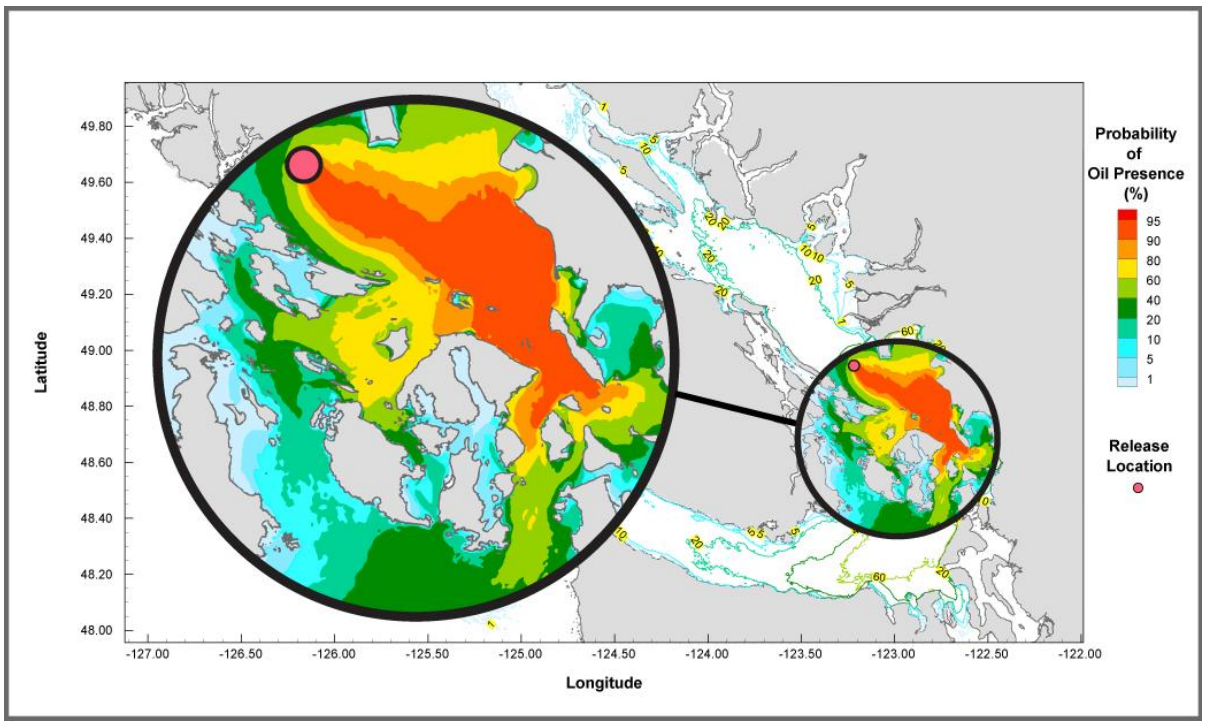

Fig. 1. Map showing results of computer simulations of how a large oil spill at the Tsawwassen ferry crossing (location D) would have spread during the summer of 2012 (see reference 19).

From an incident at location D, a resulting oil spill will be governed primarily by winds, tidal currents, and estuarine outflows from the Fraser River, which are strongest in spring and summer. Accordingly, the spill simulations at this location show substantially different seasonal results; how a given slick spreads can vary widely depending on the wind and current conditions at the time of the spill. This wide variability presents special problems that first responders and clean-up crews must be ready to address due to the close proximity of sensitive habitats and shorelines in both Canada and the United States.

In the summer, for example, the combination of strong Fraser outflows, northwest winds in Georgia Strait, and tidal exchanges would usually push a spill southeastward toward Rosario Strait, most severely impacting Orcas Island and Whatcom County shorelines and to a lesser extent Blakely and Decatur Islands and the National Monument shorelines on Lopez Island (see Fig. 1). Without containment, within the first 24 hours, oil would reach Patos and Sucia

Islands and the north shore of Orcas (see Fig. 2). The shores of Lummi Island and the sensitive Cherry Point Aquatic Reserve would begin experiencing impacts after a similarly brief period of 1–2 days.

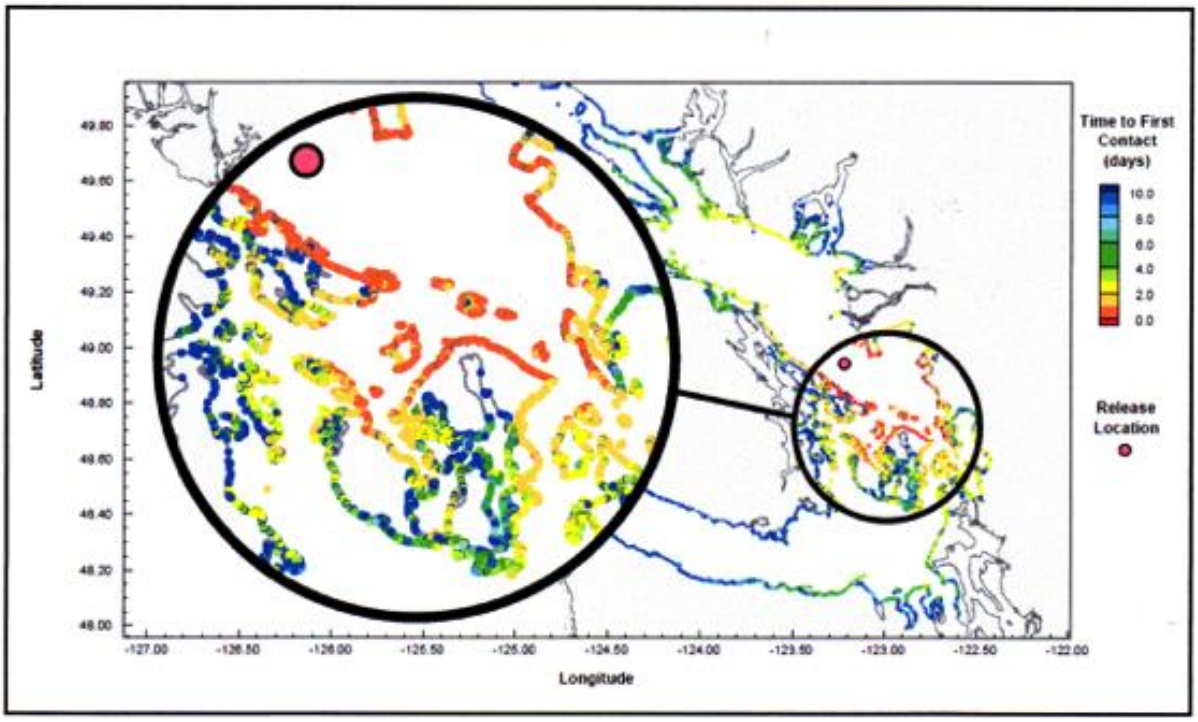

Fig. 2. The average time that will elapse before oil from a spill at location D would reach the shores of the San Juan Islands, Gulf Islands, Saanich Peninsula and Whatcom County, based on simulations of a large oil spill that could have occurred during the summer of 2012.[15]

In other seasons, an oil spill at location D would spread generally southward, with lobes entering both Boundary Pass and Rosario Strait. In almost all of these cases, Patos Island (the largest island in the San Juan Islands National Monument) would experience the earliest impacts of the spill and soon thereafter Skipjack Island would be coated. Both National Monument islands have sensitive wildlife habitat and if efforts to contain the spill failed, they would quickly become death traps for wildlife.

These problems are of great concern to San Juan Islanders because according to simulations in the Trans Mountain proposal, the most severe consequences of

[15] Adapted by Shaun Hubbard from Trans Mountain Pipeline ULC, "Modeling the Fate and Behaviour of Marine Oil Spills For the Trans Mountain Expansion Project," November 2013, Figures D.3-2 and D.3-4.

a major spill (at locations D or E) fall disproportionately upon our shores and waters. Given the fragility of the local marine ecosystem and its importance to our islands' tourism economy, such a catastrophic event must be avoided at all costs. An alternative to the Georgia Strait Juan de Fuca passage, which has not been considered by Kinder Morgan, is for the oil tankers to travel north through Georgia Strait and Discovery Passage, thus largely eliminating threats to the San Juan Islands.

The Unresolved Problems of Diluted Bitumen Spills

The fact that oil tankers from Vancouver's Westridge Terminal are currently shipping approximately 300,000 BPD and are projected to transport an additional 590,000 BPD of diluted bitumen ("dilbit") through the waters of the San Juans Islands directly affects Lopez Island and the San Juans in general. Based on the July 2010 Kalamazoo River oil spill, in which Enbridge pipeline 6B ruptured and released over 20,000 barrels of dilbit into the river,[16] and the mixed results of controlled experiments concerning the fate and behavior of dilbit in marine waters,[17] two serious problems appear in such circumstances:

- the rapid evaporation of the VOC's, the flammable diluents used, which include natural gas liquids such as naphtha and toxic substances such as benzene, toluene and xylene
- the sinking of the heavier portions of the tar-sands oil, especially in the presence of suspended fine sediments

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[16] Elizabeth McGowan and Lisa Song, "The Dilbit Disaster: Inside the Biggest Oil Spill You've Never Heard of," *Inside Climate News*, part 1: June 26, 2012 (attached as Exhibit 3); part 2: June 27, 2012; and part 3, June 28, 2012. For the official NTSB analysis of the causes, see National Transportation Safety Board, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010*. Pipeline Accident Report NTSB/PAR-12-01, Washington, DC, July 2012.

[17] For a brief review of dilbit experiments, see Environment Canada, Fisheries and Oceans Canada, and Natural Resources Canada, "Properties, Composition and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from Canadian Oil Sands," Federal Government Technical Report, Cat. No. En84-96, November 13, 2013, pp. 11–21.

The first problem is of extreme concern to first responders and spill-cleanup crews because it imposes serious personnel hazards that would impede and render their work less effective. The second will make complete cleanup of the spill very difficult, even impossible, because all oil-spill cleanup technology operates on the assumption that oils float on water.

As part of the Kinder Morgan proposal, three subcontractors did a series of experiments on the fate and behavior of diluted-bitumen products in a simulated environment.[18] Called the "Gainford study", these experiments were conducted in tanks of salted water and attempted to replicate conditions in Burrard Inlet, where the Westridge Terminal is located. Using two dilbit varieties called Access Western Blend and Cold Lake Winter Blend, it concluded that rapid evaporation of VOC's (the diluents) occurred soon after the dilbit was released into the water, but that sinking of the bitumen portion was negligible. Unfortunately, much of the project planning for spill recovery and cleanup operations seems to have been based on the conclusions of the Gainford study which modeled a very limited set of spill conditions for just one type of diluted bitumen, Cold Lake Blend.

Cold Lake blends are some of the lightest and least viscous forms of dilbit, so these conclusions cannot be generalized to heavier, stickier forms of dilbit derived from Athabasca and Peace River tar-sands deposits, according to Anthony Swift of NRDC Canada.[19] Furthermore, the Gainford study made no attempt to assess what happens when fine sediments are present in the water column. Recent research and reviews of existing literature indicate that some of

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[18] Witt Obrien's, Polaris Applied Sciences, and Western Canada Marine Response Corporation, "A Study of the Fate and Behavior of Diluted Bitumen Oils on Marine Waters," (the "Gainford study") Vol. 8C, TR 8C-12 S7 of the Kinder Morgan Trans Mountain Pipeline Expansion Project report.

[19] Anthony Swift, presentation to members of the National Academies panel on "Effects of Diluted Bitumen on the Environment: A Comparative Study," Irvine, CA, May 4, 2015 (notes of M. Riordan).

the diluted bitumen will indeed sink in the presence of sediments. For example, a 2013 report by Environment Canada and two other Canadian agencies conclude: "When fine sediments are suspended in saltwater, high-energy wave action mixed the sediments with the diluted bitumen, *causing the mixture to sink* or be dispersed as floating tarballs."[20] This conclusion can also explain what happened in the Kalamazoo River spill, where recent heavy rains and runoff filled the water with sediments which when mixed with the dilbit leaking from the ruptured pipeline caused a substantial portion of the dilbit to sink to the river bottom.

A definitive resolution on the question of sinking dilbit in the presence of suspended sediments must be answered prior to approval of the project by the NEB. A report, in preparation, by a US National Academies panel reviewing the "Effects of Diluted Bitumen on the Environment", should help clarify the behavior of dilbit in saltwater when sediments are present. It is likely that the panel may also recommend further research be conducted by Canadian as well as US agencies, which will take time.

This is an extremely important question to resolve because there are fine sediments in the waters of the southern Georgia Strait and the San Juan Islands, especially during the spring and summer, due to strong outflows from the Fraser River (see fig. 3). Georgia Strait has long fetches of open water so winds can easily provide the high-energy wave action needed to mix the sediments with the diluted bitumen. A spill at location D (depicted in fig. 1), would occur right in the midst of these Fraser River outflows, especially if it occurred in spring or summer. These are also the times of the strongest ebb currents (enhanced by these outflows), so any dilbit with adhered sediment could sink into the deep sub-sea canyons around the San Juan Islands. According to marine geologist

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[20] Environment Canada et al., "Properties, Composition and Marine Spill Behaviour," p. 5 (emphasis added). For a comprehensive review of the subject, see J. Michel, "Submerged Oil," in M. Fingas, ed., *Oil Spill Science and Technology* (Oxford, UK: Elsevier, Inc. 2010), pp. 959–981.

Gary Greene, who has been mapping the sea floor around this archipelago, this sunken oil could end up in benthic habitats of bottom-dwelling species such as rockfish and sand lance.[21]

Fig. 3. Ship-level view of the Fraser River plume in southern Georgia Strait. The brown waters to the right have much higher levels of fine sediment than the blue Salish Sea salt water at left. (Credit: Ocean Networks Canada/Ed McNichol)

In light of what happened in the Kalamazoo River dilbit spill, the project proponents seem to have grossly underestimated the amount of submerged oil that will occur in representative spills. For example, in the spring and summer simulations for large and medium spills at location D, the amount of oil-mineral aggregates is estimated to be *less than 0.01 percent*, compared to about 10 percent in the case of the Kalamazoo River spill.[22] What is truly puzzling here is that the estimates of oil-mineral aggregates are *much higher* in the fall and winter, when the Fraser River outflows and resulting fine-sediment concentrations are much

[21] H. Gary Greene, private communication with Michael Riordan, co-author of Orcas NO COALition Comment Letter, Hearing Order OH-001-2014 .

[22] Trans Mountain Pipeline ULC, "Modeling the Fate and Behaviour of Marine Oil Spills," Tables 8.2.2 and 8.2.4 on pp. 32–33. These figures curiously grow to 0.04–0.08 percent in fall and winter. And they appear to be negligible in a computer simulation from the same report of a dilbit release into the freshwater Fraser River. Something is seriously amiss with these simulations: probably the use of an antiquated 1987 estimation technique and assumptions based upon the limited Gainford study that sinking dilbit is not a serious problem needing to be dealt with.

lower. This seems paradoxical. Something is obviously wrong with the method being used to estimate the quantity of submerged oil. A better understanding of the problem should await the results of the National Academies dilbit study and repeat these calculations with a new and improved model of the interactions between fine sediments and tar-sands crude. The NEB should withhold approval until the floating or sinking characteristics of dilbit in saltwater is settled science.

Additionally, whether or not some of the diluted bitumen sinks, there will always be the challenge of toxic, flammable gas releases. According to the simulations and tests funded by Kinder Morgan , these releases are the most intense during the first 24 hours after a spill occurs.[23] This was the experience of people in Marshall, Michigan, who lived close to the rupture of Enbridge pipeline 6B and the release of diluted bitumen into a nearby creek and the Kalamazoo River. They complained of an "acrid stench" and had to evacuate their homes immediately afterwards.[24] Tests showed that high levels of benzene, a recognized carcinogen, had occurred; this stench was attributed to the rapid evaporation of the diluents, which typically contain benzene, toluene and other light aromatic hydrocarbons. Similar releases of these toxic compounds in a marine spill would only exacerbate the already difficult problems of first responders, who will have to use artificial breathing equipment and wear protective garments if they are to work effectively even at the margins of a rapidly spreading spill. Such hazards would limit the activities of first responders and spill-cleanup crews, with the result that containment of a dilbit spill in the crucial early hours will be slowed and thus less effective than it might otherwise be. Because these limitations are not sufficiently addressed in the Trans Mountain proposal, the assessments of spill containment and cleanup

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[23] See, for example, Trans Mountain Pipeline Expansion Project proposal, Vol 8A, figs. 5.4.21 (p. 573) and 5.4.26 (p. 580).

[24] McGowan and Song, "The Dilbit Disaster," part 1.

presented seem unduly optimistic.[25] This observation seems especially pertinent after the deficiencies of the Canadian Coast Guard and other spill responders in the recent Marathassa spill in English Bay.[26] A reevaluation of these more limited response capabilities and their probable impact on dispersing oil spills is warranted in light of the rapid early evaporation of toxic gases and the poor performance on the English Bay spill.

Another concern involves spill responses in the contiguous waters of the US and Canada. Transnational responses are complicated by an unresolved legal process which would permit responders from one country to work in another country, thus greatly hindering prompt and effective transboundary spill response in areas such as Haro Strait. Left uncorrected, the operational concept of "limited responder immunity" creates a "gap" in both nations ability to carry out the intent of the US and Canadian Joint Contingency Plan.[27] This "gap" ensures both nations begin a spill response in uncertain conditions which are certain to pose a threat to the very natural resources and commerce they seek to protect. "As a result, neither nations' Coast Guard can presently rely on mobilizing private responders' resources across the border to mount an effective and coordinated response to a transboundary spill."[28] There is no limited immunity under Canadian law for US Oil Spill Response Organizations (OSROs) to cross into Canadian waters in response to a spill, or even in a drill, and this unsettled issue has been of "great concern" to both Canada and the US for almost two decades.[29]

As the United States Coast Guard observed in a May 2014 report to Congress, "The transportation of Canadian oil sands products does, however,

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[25] Trans Mountain Pipeline Expansion proposal, vol. 8A, section 5.5: Oil Spill Preparedness and Response, pp. 600–612.

[26] "The English Bay Oil Spill Was a Warning on the Risks of Major Tankers," [editorial] *The Globe and Mail*, April 26, 2015.

[27] CANUSPAC 2014, After Action Report, 04 June 2014, pages 11 -13.

[28] Ibid.

[29] Ibid, page 11.

present new challenges for the maritime spill response community."[30] The report goes on to state:

> Currently, there is scientific uncertainty about how Canadian oil sand products would weather and behave in aquatic environments at different ranges of temperatures, salinity and sedimentation. There is also uncertainty about the extent that the diluent will separate from Canadian oil sands products under different spill conditions. These uncertainties pose a major challenge to oil spill responders.[31]

And it further states:

> Response to a submerged oil spill in the Salish Sea would likely be very different than Kalamazoo, with strong tidal currents and depths of over 100 fathoms in much of the region.[32]

Until all of these uncertainties have been resolved and appropriate response protocols, technologies, and international agreements are developed to deal with the additional problems of a dilbit spill, the Trans Mountain project should not be permitted to proceed. The report soon expected from the US National Academies may address some uncertainties, but more experiments are likely to be needed to understand the fate and behavior of the different varieties of tar-sands crude oil in various marine environments. Such research is likely to require years before a thorough understanding can be attained. And oil-spill responders may never be able to develop suitable techniques to recover sunken dilbit from depths of the Salish Sea.

Given the catastrophic impacts that a major dilbit spill would likely have in the waters of the San Juan Islands, including fouling the shores of a National Monument and the loss of the marine life it supports, the precautionary principal dictates that the Trans Mountain project be put on hold until all legal, scientific and technical questions have been resolved.

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[30] United States Coast Guard, "Risk Assessment of Transporting Canadian Oil Sands," report to the United States Congress, May 29, 2014 (Attached as Exhibit 3), p. 18.

[31] Ibid.

[32] Ibid. p. 19.

Adverse Impacts on the San Juan Islands Marine Ecosystem

The Trans Mountain proposal includes extensive listings of marine habitats that would be impacted by the simulated major spills in the Salish Sea, including many of the species that frequent San Juan Islands waters.[33] But it mentions little, if anything, about the adverse impacts on specific species at risk, focusing instead on the percentages of their general habitats that would be fouled. In the case of whales (which includes humpback whales and Orcas lumped together), for example, project proponents conclude that 22–27 percent of their habitat would be affected by a major spill at location D, which they admit is a "relatively high probability for exposure for whales" but then state, without foundation, that effects "would not likely be lethal, except in the cases of weaker animals such as calves and older and diseased animals."[34]

In light of these thoughtless statements, the *Exxon Valdez* oil spill provides a useful comparison with the worst-case Trans Mountain spill scenarios, as it was a major oil spill in a cold-water marine environment supporting many of the same or similar residents of the San Juans. In that event, a healthy pod of over 30 killer whales that swam through the spill is now on its way to extinction, with only about a half dozen whales remaining, sadly none of them reproducing females.[35] Healthy populations of eagles, sea otters and seabirds were decimated and are only now slowly recovering. And the once-thriving local herring fishery collapsed over the next few years and was closed; it has yet to re-open.[36] Twenty six years later, remnant oil still lingers in beach sediments along the shores of Prince William Sound, seeping out whenever one digs into the substrate.

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[33] For spill location D, for example, see Trans Mountain proposal (ref. 15), Vol. 8A, pp. 643–656.

[34] Ibid. p. 655.

[35] David Malakoff, "25 Years After the *Exxon Valdez*, Where Are the Herring?" *Science* (28 March 2014), p. 1416.

[36] Ibid. See also Richard E. Thomas and Gary L. Thomas, "Herring and the *Exxon Valdez* Oil Spill: an Investigation into Historical Data Conflicts," *ICES Journal of Marine Science*, Vol. 65 (2008), pp.44–50.

Based on the *Exxon Valdez* example, one can reasonably conclude that a major oil spill in or near the waters of the San Juan Islands would have catastrophic effects on the local marine ecosystem, likely leading to the loss of certain species at risk.[37] If Orcas were exposed to a spill, loss of one or more of their pods would probably occur given the existing stresses upon them and the impacts of added underwater noise pollution due to increased Trans Mountain oil tanker traffic. Even if Orcas were not present, the adverse impacts of a spill on Chinook salmon (Southern Resident Killer Whales principal food) will harm them just as would impacts on Salish Sea herring populations effect the salmon population. Already some herring populations, such as those at Cherry Point, are already struggling. These *ecosystem impacts*, which affect an entire food web, are not discussed in the Trans Mountain proposal. Further more, they are almost impossible to persuasively simulate, given the complexity and the multitude of interactions and the scientific uncertainties involved. But, despite the fact that computer modeling cannot adequately express the interdependence of these relationships does not mean that they do not exist. Our best guide is therefore what happened in the closest comparable event: the *Exxon Valdez* oil spill.

In fact, what will happen in a large dilbit spill in Salish Sea waters is almost certain to turn out to be *worse* than what happened in Prince William Sound, due to the added impacts of hydrocarbons in the diluents, some of which (e.g., benzene) will become dissolved in the water. Computer simulations calculate that between 5 and 10 percent of spilled oil will end up being dissolved, but there seems to be little if any evaluation of the impact that these dissolved hydrocarbons would have on Salish Sea organisms.[38] The focal point of the proposal seems to be almost entirely focused upon oiled shorelines and tidal

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[37] For a recent summary, see Joseph K. Gaydos and Jacquelyn Zier, "Species of Concern Within the Salish Sea Nearly Double Between 2002 and 2013," *Proceedings of the 2014 Salish Sea Ecosystem Conference*, Seattle, WA, April 20–May 2, 2014.

[38] For location D, for example, see Trans Mountain Pipeline ULC, "Modeling the Fate and Behaviour of Marine Oil Spills," Tables 8.2.2 and 8.2.4, on pp. 32–33, which indicate that 6.7–9.1 percent of the total by mass of the spilled dilbit will become dissolved in the water.

flats; the adverse impacts of sinking dilbit upon bottom-dwelling creatures such as rockfish and Pacific sand lance (on which salmon and whales are known to feed) are not to be found in the Trans Mountain proposal. This is another serious, if not glaring, omission.

Summary and Request

In summary, the Kinder Morgan Trans Mountain Pipeline Expansion Project, as proposed, would inevitably have direct major adverse impacts on the environment and economy of Lopez Island, in particular, and the San Juan Islands in general. In fact, San Juan County is uniquely and disproportionately impacted by the risks of oil spills and accidents associated with this project. And nowhere is consultation with San Juan County contemplated; this is another *glaring* error.

These impacts can be grouped into three principal categories:

1. The additional tanker traffic involving about 700 large-vessel transits per year through waters near the San Juan Islands will substantially and significantly increase the risks of a major oil spill in the swift currents and rock strewn shores around the San Juan Islands. Such a spill would be difficult to contain and would decimate many species including Chinook salmon and, more importantly, would likely wipe out fragile and endangered populations such as our resident Orcas. The impacts of a major spill would be catastrophic to the islands' economy, which depends heavily on attracting tourists and new residents seeking the beauty of our environment.
2. These oil tankers would be carrying diluted bitumen, whose fate and behavior in marine environments is presently poorly understood. Strong scientific evidence suggests that a fair portion of spilled dilbit would sink in Salish Sea waters, especially when admixed with fine sediments from Fraser River outflows; the resulting mixture would be unrecoverable and sink into the deep seabed around the San Juan Islands, adversely impacting bottom dwellers such as rockfish and sand lance.

The only mention of diluted bitumen in the 145 Draft Conditions, just published, was for a relatively minor spill in Burrard Inlet. We find this astonishing as well as potentially purposefully *negligent*. Furthermore, among those 145 Draft Conditions, the modeling evaluations for oil spills in Georgia Strait (site D) and Haro Strait (site E) failed to seriously include impacts to the San Juan Islands or the Gulf Islands. This failure to incorporate impacts of prime importance to San Juan County, and the Canadian Gulf Islands, are additional examples of *neglectfully glaring* errors that must be corrected before the NEB can render a fair and methodical final approval.

3. The rapid evaporation of toxic gases from a dilbit spill will endanger first responders and make early containment very difficult. The challenges of swift and changing currents, compounded by. the still confused responder immunity issues, and the uncertainties surrounding the deployment of critical resources further complicate and intensify oil-cleanup and recovery problems. Moreover, the Trans Mountain proposal has underestimated the problems of containing a dilbit spill, treating it as if it were an ordinary spill of crude oil that could be addressed using standard spill-response technology and techniques. We find this to be yet *another glaring deficiency in the proposal*.

Because of these problems, we respectfully request that the National Energy Board deny this project application or, at a minimum, withhold approval until all of our identified deficiencies are corrected, San Juan County government is consulted, and our economy and environment are protected from this ill-conceived project.

Sincerely,

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Cc: The Honorable Maria Cantwell, US Senator
The Honorable Patty Murray, US Senator
The Honorable Rick Larsen, US Representative
The Honorable Jay Inslee, Governor of the State of Washington
The Honorable Kevin Ranker, Washington State Senator
The Honorable Jeff Morris, Washington State Representative
The Honorable Kristine Lytton, Washington State Representative
The Honorable Bob Jarman, Chair, San Juan County Council
The Honorable Jamie Stephens, Vice-Chair, San Juan County Council
The Honorable Rick Hughes, Member, San Juan County Council