

INTRODUCTION

This paper focuses on the movements of crude oil derived from Alberta's vast reserves of bitumen referred to as "oil sands" or "tar sands" through the Salish Sea. Tar sand oil is diluted with lighter volatile products to enable it to be shipped by pipeline, rail or tanker. This combination is known as "dilbit," for diluted bitumen. For the rest of this paper the term dilbit will be used rather than tar sands given that is the form in which tar sands are transported through the Salish Sea. It is important to note that bitumen is diluted with a variety of products, each posing unique spill response challenges, but will be collectively referred to as dilbit.

The difficulty and unmet needs for responding to a dilbit crude oil spill motivated this new analysis of oil spill risk in the Salish Sea. The reasons for this concern were rigorously documented in a report published by the National Academy of Sciences (NAS) in 2016.² Fortunately, the NAS study was released while this paper was being completed enabling its findings to be incorporated herein.

The vulnerability of the Salish Sea to a spill of dilbit crude oil is further heightened by the poorly publicized proposal to triple the Kinder Morgan/Trans Mountain Pipeline that connects the vast supplies of bitumen in Alberta, Canada to an oil terminal in Burnaby, BC. The proposal would result

in an increased capacity to ship dilbit crude from 300,000 bbls/day to 890,000 bbls/day.³ A 2014 vessel traffic risk assessment, (VTRA 2010) concluded the proposal would result in a 7-fold increase in tanker traffic transiting through the Salish Sea as compared to 2010. The number of dilbit-carrying oil tankers would increase from approximately 1 per week to 1 per day, significantly increasing the amount of oil being transported through the San Juan Islands in Haro Strait and Boundary Pass (Appendix 1).⁴

This paper focuses on existing dilbit shipments between Kinder Morgan's Burnaby, BC terminal and the U.S. Oil & Refining Co. refinery in Tacoma, WA in order to elevate public attention for the need to improve oil spill prevention and response capabilities within the Salish Sea. In addition, it is intended to identify the significant risk associated with Kinder Morgan's proposed expansion of dilbit crude shipping through the Salish Sea.

Dilbit crude oil is currently shipped from the Burnaby terminal through the Salish Sea on tankers bound to ports on the west coast and overseas. It is also transported within the Salish Sea approximately six times a month (see results section) on barges towed by conventional tugs through the particularly fast currents along Rosario Strait, Admiralty Inlet and Puget Sound. Though tankers carry more oil than barges, tug and tow marine transport is of higher risk due to the limited maneuvering capabilities and risks of tow wires snapping.

Sause Brothers, a U.S. Oil & Refining Co contractor based in Coos Bay, Oregon owns and operates the barges used in this trade. This is the same company that experienced a tug snapping the tow wire of its barge, Nestucca, in heavy seas along the Olympic Coast in the winter of 1988.⁵ The Nestucca was full of heavy, Bunker C oil bound to the ARCO Refinery

at Cherry Point, Washington. ARCO is now owned and operated by BP. The resulting 231,000 gallon oil spill spread 800 square miles, from Newport Oregon to the west side of Vancouver Island. Much of it remained partially submerged due to its density. Still, it was estimated that over 56,000 seabirds were killed.⁶ This incident is not intended to reflect on Sause Brothers' current operations, on which we have no information, but to highlight what could occur from increased numbers of barges operating in the region.

More recently, there have been a series of incidents involving tugs towing a variety of cargo along Rosario Strait between 2011 and 2013, including collisions with navigational aids. Coast Guard Sector Puget Sound issued voluntary Marine Safety Advisory 16630⁷ on October 9, 2012 after 5 incidents with tugs and tows in Rosario Strait between October 10, 2011 and December 23, 2011. Two additional incidents occurred on May 23, 2013 and September 8, 2013 since the issuance of the Safety Advisory. The Advisory was incorporated into the Puget Sound Harbor Safety Plan (Appendix 4) but no state or federal regulations have been proposed since then.

On March 2, 2016 two barges were being towed when high winds blew them to shore near Victoria, BC. One barge, carrying two thousand liters of diesel fuel, was removed the next day. The other, carrying construction debris, took weeks to be removed from the beach. See "Grounded barge was a warning"⁸ and "Work begins to unload, remove barge grounded off Dallas Road."⁹ Once again on March 15, 2016 a U.S. tug and barge bound for Alaska carrying general cargo touched bottom near Campbell River, BC.¹⁰

Canadian tugs have suffered a similar fate. In 2015 alone, six tugs have sunk in nine incidents along the British Columbia¹¹ coast. The fact that modern barges are equipped with double hulls does little to assuage concerns about this form of oil transportation. A 2011 study questioned the effectiveness of double hulls in reducing vessel-accident oil spillage.¹² Utilizing U.S. Coast Guard vessel accident pollution incidents between 2001 and 2008 the authors found that on average double hulls reduced the size of oil spills by only 20 percent in barges and 62 percent in tankers.

